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October 28, 2005

Ms. Darleen Goering
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New Mexico Environment Department
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Transmittal of Additional Shaw PRB Information and Reports

Dear Ms. Goering:

Please find attached additional progress reports (hard copy and a CD) for Shaw installed PRBs, as requested by you. Please contact Don Hickmott if you require any additional information.

Sincerely,

John M. Pietz, PE
Shaw Environmental

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BIOGEOCHEMICAL, MINERALOGICAL, AND HYDROLOGICAL CHARACTERISTICS OF AN IRON REACTIVE BARRIER USED FOR TREATMENT OF URANIUM AND NITRATE

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Book chapter for:

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ABSTRACT

A permeable iron reactive barrier was installed in late November, 1997 at the U.S. Department of Energy's Y-12 National Security Complex in Oak Ridge, Tennessee. The overall goal of this research was to determine the effectiveness of the use of zero-valent iron (Fe^0) to retain or remove uranium and other contaminants such as technetium and nitrate in groundwater. The long-term performance issues were investigated by studying the biogeochemical interactions between Fe^0 and groundwater constituents and the mineralogical and biological characteristics over an extended field operation. Results from nearly 3 years of monitoring indicated that the Fe^0 barrier was performing effectively in removing contaminant radionuclides such as uranium and technetium. In addition, a number of groundwater constituents such as bicarbonates, nitrate, and sulfate were found to react with the Fe^0. Both nitrate and sulfate were reduced within or in the influence zone of the Fe^0 with a low redox potential (i.e., low Eh). An increased anaerobic microbial population was also observed within and in the vicinity of the Fe^0 barrier, and these microorganisms were at least partially responsible for the reduction of nitrate and sulfate in groundwater. Decreased concentrations of Ca^{2+} and bicarbonate in groundwater occurred as a result of the formation of minerals such as aragonite ($CaCO_3$) and siderite ($FeCO_3$), which coincided with the Fe^0 corrosion and an increased groundwater pH. A suite of mineral precipitates was identified in the Fe^0 barrier system, including amorphous iron oxyhydroxides, goethite, ferrous carbonates and sulfides, aragonite, and green rusts. These minerals were found to be responsible for the cementation and possibly clogging of Fe^0 filings observed in a number of core samples from the barrier. Significant increases in cementation of the Fe^0 occurred between two coring events conducted at ~1 year apart and appeared to correspond to the changes in an apparent decrease in hydraulic gradient and connectivity. The present study concludes that, while Fe^0 may be used as an effective reactive medium for the retention or degradation of many

redox-sensitive contaminants, its long-term reactivity and performance could be severely hindered by its reactions with other groundwater constituents; and groundwater flow may be restricted because of the build up of mineral precipitates at the soil/Fe^0 interface. Depending on the site biogeochemical conditions, the rate of Fe^0 corrosion may increase; therefore, the life span of the Fe^0 barrier could be shorter than predicted in previous studies (~15–30 years).

I. INTRODUCTION

The use of zero-valent iron (Fe^0) filings to remediate groundwater contaminated with chlorinated organic compounds, heavy metals, and radionuclides has received considerable attention in recent years (Gillham et al., 1994; Gu et al., 1999; Liang et al., 2000; O'Hannesin and Gillham, 1998; Puls et al., 1999; Scherer et al., 2000; Sivavec et al., 1997; Tratnyek et al., 1997). Although the mechanisms for degrading or immobilizing these contaminants with Fe^0 are not completely understood (Roberts et al., 1996; Sivavec et al., 1997), it has been shown that Fe^0 is a promising reactive medium because of its efficiency in degrading or retaining contaminants and its relatively low cost. Consequently, the Fe^0–based reactive barrier treatment has been widely emplaced for passive, long-term applications for groundwater remediation.

While the focus of many applications was on utilizing an Fe^0–based barrier treatment system to remove or retain environmental contaminants, relatively few studies have paid particular attention to other biogeochemical reactions that may occur simultaneously as Fe^0 corrodes in groundwater. It is recognized that groundwater geochemistry plays a significant role in determining rates of Fe^0 corrosion, its surface reactivity, mineral precipitation and/or barrier clogging, microbial activity, and consequently the long-term performance of the Fe^0 treatment system (Gu et al., 1999; Liang et al., 2000; Scherer et al., 2000). Although the roles of dissolved O_2 and pH in determining Fe^0 reactivity and precipitation chemistry are well established, interactions between Fe^0 and other groundwater constituents, such as HCO_3^-, NO_3^-, SO_4^{2-}, and some metal cations, such as Ca^{2+}, are less well studied and defined. In particular, because SO_4^{2-}, NO_3^-, and HCO_3^- are all corrosive to Fe^0 (Agrawal et al., 1995; Gui and Devine, 1994; Lipczynska-Kochany et al., 1994; Odziemkowski et al., 1998) and are commonly found in groundwater at contaminated sites, these groundwater constituents are of great significance in

influencing both the geochemical and biological interactions and the barrier-clogging processes.

A potential limitation of the Fe^0 technology is the deterioration of the Fe^0 reactive media by corrosion and the subsequent precipitation of minerals that may cause cementation and decreased permeability of the Fe^0 barrier or the surrounding soil. Few studies are available concerning the mineralogical and long-term performance characteristics of Fe^0-based barriers (Gu et al., 1999; Mackenzie et al., 1997; O'Hannesin and Gillham, 1998). However, data indicate that a suite of mineral precipitates can occur rapidly in the Fe^0 barrier system, and flow restriction could occur under certain biogeochemical conditions (Gu et al., 1999; Liang et al., 1997; Mackenzie et al., 1997; Phillips et al., 2000). Minerals such as goethite, magnetite, ferrous carbonates, sulfides, green rusts, and calcite have been reported in both laboratory and field investigations (Gu et al., 1999; Phillips et al., 2000; Pratt et al., 1997). For example, a substantially decreased flow rate was observed over a 6-month period in a series of Fe^0-filled canisters used for treating trichloroethylene-contaminated groundwater at the Portsmouth Gaseous Diffusion Plant (Piketon, Ohio) (Liang *et al.* 1997). Post-treatment analysis of the Fe^0 filings showed cementation of the iron grains, possibly as a result of precipitation of iron sulfides, oxyhydroxides, and carbonates. Clogging also has been reported in laboratory and pilot-scale studies with Fe^0 filings as reactive media (Johnson and Tratnyek, 1994; Scherer et al., 1998). At the Lowry Air Force base (AFB) in Denver, CO, and at Elizabeth City, NC, sites, green rusts (i.e., a mixture of partially reduced/oxidized iron oxyhydroxides and sulfate) were observed in barrier materials (Edwards et al., 1996; Puls et al., 1999). At the Hill AFB, Utah, site, precipitation of iron and calcium carbonates was concluded to be responsible for a 14% porosity reduction within a few months of operation (Shoemaker et al., 1995). In contrast, mineral precipitation was not observed after one year of operation in a reactive barrier at the

Borden, Ontario, site.

This chapter presents the results obtained from ~3 years of groundwater monitoring to evaluate the performance of an Fe^0 reactive barrier used primarily for the retention (or degradation) of uranium (U) and other contaminants such as technetium (Tc) and nitrate (NO_3^-) at the U.S. Department of Energy's Y-12 National Security Complex in Oak Ridge, Tennessee. Emphasis was given to the biogeochemical interactions between Fe^0 and groundwater constituents, the mineralogical and hydrological characteristics, and related long-term performance issues of the reactive barrier system.

II. BARRIER SITE DESCRIPTION

II.A. Site Hydrogeology

Past waste disposal activities at the Oak Ridge Y-12 S-3 ponds have created a mixed-waste plume of contamination in the underlying unconsolidated residuum and competent shale bedrock. The plume is more than 400 ft deep directly beneath the ponds and extends ~4,000 ft along geologic strike both east and west of the ponds. The S-3 ponds consisted of four unlined ponds constructed in 1951 on the west end of the Y-12 Plant. The ponds had a storage capacity of 40 million liters (or ~10 million gallons). Liquid wastes, composed primarily of nitric acid plating wastes, containing various metals and radionuclides (e.g., Ni, Cr, U, and Tc) were disposed of in the ponds until 1983. Volatile organic compounds such as tetrachloroethylene and acetone also were disposed in the ponds, although only low levels of chlorinated organic contaminants and acetone were detected in the groundwater at the barrier site. Pond wastes that remained were neutralized and denitrified in 1984, and the site was capped and paved thereafter (Cook et al., 1996; SAIC, 1996, 1997).

The geology that underlies the site is primarily the Nolichucky shale bedrock that dips approximately 45 degrees to the southeast and has a strike of N55E (parallel to Bear Creek Valley). Overlying the bedrock is unconsolidated material that consists of weathered bedrock (referred to as residuum or saprolite), alluvium, colluvium, and man-made fill materials. Silty and clayey residuum comprises most of the unconsolidated material in this area. The residuum overlying the Nolichucky shale is typically between 5 and 10 m (~20 and 30 ft) thick. Between the unconsolidated residuum and competent bedrock is a transition zone of weathered fractured bedrock. Remnant fracturing in the residuum and transition zone increases the permeability relative to the silt and clay matrix. The shallow groundwater flow direction west of the S-3 Ponds is generally to the southeast with a horizontal gradient of approximately 0.016 ft/ft (SAIC, 1996). Additionally, upward vertical hydraulic gradients were identified at the site and are as high as 0.25 ft/ft between the competent bedrock and transition zone, and ~0.12 ft/ft between the transition zone and shallow unconsolidated zone (Watson et al., 1999).

In general, the groundwater plume near the S-3 ponds is composed primarily of nitrate, bicarbonate, uranium, technetium, and other metal ions. These inorganic metal contaminants include low levels of heavy metals such as Ni, Cr, Co, Cd, Zn, and Pb. The plume is stratified, with the distribution of contaminants dependent on geochemical characteristics of the contaminants and groundwater. For example, nitrate and technetium (as pertechnetate, TcO_4^-), which are not particularly reactive with soil minerals, have the most extensive distribution in groundwater. Uranium and heavy metals that are more reactive are not as deep and have not migrated as extensively away from the ponds. Three major groundwater migration pathways to Bear Creek and its tributaries have been identified during the Bear Creek Valley Treatability Study (SAIC, 1997).

- Pathway 1 is located just to the south of and adjacent to the S-3 Ponds and is a shallow pathway to the upper reach of the Bear Creek. Contaminants in this pathway include uranium, technetium, nitrate, metals, and high total dissolved solids (TDS).
- Pathway 2 is another shallow pathway to the upper reaches of Bear Creek and is located approximately 600 ft downstream west from Pathway 1. This pathway is thought to be associated with an old burial Bear Creek stream channel. The iron/gravel trench barrier is located at this site and is targeted to treat primarily low levels of uranium and nitrate (described in detail in Section II.B).
- Pathway 3 consists of contaminated groundwater in bedrock that is migrating to the west along strike in the Nolichucky Shale. Contaminants in this deeper pathway discharge to tributaries of Bear Creek and include technetium, nitrate, metals, and high TDS. Pathway 3 contains much less uranium than the other pathways.

II.B. Installation of the Iron-Gravel Trench Barrier

A permeable iron-gravel trench barrier was constructed at the Pathway 2 site in late November 1997 as part of the technology demonstration using Fe^0 to retain or remove uranium and other contaminants as groundwater passively passes through the Fe^0 treatment medium. The Pathway 2 site is predominantly a shallow pathway for the migration of uranium-contaminated groundwater (~1 mg/L) to the upper reach of Bear Creek. The nitrate concentrations are generally lower (~20–150 mg/L) at Pathway 2 than other areas of the groundwater plume, but they have been detected at levels above 1000 mg/L in some of the deeper piezometers because of the upward vertical hydraulic gradient. Technetium is generally detected at levels below 600 pCi/L, and TDS concentrations (~1000 mg/L) are generally lower than in the shallow plume at

pathway 1 and deeper parts of the S-3 plume. Uranium-contaminated groundwater is discharging to the creek near Pathway 2 through seeps adjacent to the headwaters of Bear Creek.

The trench dimensions are ~225 ft in length, 2 ft in width, and ~30 ft in depth (to bedrock) with an Fe^0-filled midsection of ~26 ft in length between two ~100-ft sections of granite/quartz-pea gravel (Figure 1). Guar-gum biopolymer slurry was used during trench excavation to prevent the walls from collapsing, and Peerless Fe^0 filings (about –1/2 to 25 mesh size, from Peerless Metal Powders and Abrasives, Detroit, Michigan) were used as the reactive medium in the midsection of the barrier. A total of ~80 tons of Peerless iron filings was placed in the middle section of the trench to a depth of ~18–20 ft above the bottom of the trench, or 10 to 12 ft below original ground surface. The sediments around the barrier are heterogeneous mixtures of fill materials, native soil, saprolite, and rock fragments (Watson et al., 1999). Undisturbed soil and saprolite from the Nolichucky Shale formation are present near the bottom of the barrier. The barrier trench is oriented nearly parallel (or in a small angle) to the direction of groundwater flow and was designed to direct groundwater flow through the iron treatment zone using both the natural groundwater gradient and the permeability contrast between the iron/gravel in the trench and the native silt/clay outside the trench. Hydraulic monitoring at the site indicated that the hydraulic gradient is ~0.025 ft/ft across the site but this gradient flattens to 0.01 ft/ft in the vicinity of the barrier trench. Approximately 48 piezometers, including 6 multi-port wells in the Fe^0 barrier, were installed at the site (Figure 1). Additional information regarding the site and its hydrogeology has been reported elsewhere (Phillips et al., 2000; Watson et al., 1999).

After completion of the trench installation, the bio-polymer Guar gum was broken down with an enzyme (LED-4 jell breaker, GeoCon, Inc.) that was circulated through the trench for 2

days. That process was followed by a 5-day step-drawdown pumping test and a 7-day pumping test in the trench. The primary purpose of these initial pumping tests was to determine the hydraulic conductivity and groundwater flow conditions for a remediation scenario at the site.

II.C. Groundwater and Core Sampling and Analysis

Periodic groundwater samples were collected for the determination of contaminant metals/radionuclides (e.g., U, Tc, Cr), geochemical parameters [e.g., major cations and anions, pH, Eh, dissolved oxygen (DO), and total organic carbon (TOC)], and microbial characteristics from some selected monitoring wells. The groundwater pH, Eh, DO, and temperature were measured in line (without exposing to the air) by means of a YSI XL600M multiparameter probe (Yellow Springs Instruments, CO), which had been pre-calibrated. Ferrous ion (Fe^{2+}) and sulfide (S^{2-}) were determined immediately after taking samples in the field by the colorimetric technique using HACH kits equipped with a DR/2000 spectrophotometer (HACH, Loveland, CO).

The filtered groundwater samples (using 0.45-μm in-line filters) were also collected in two separate containers, either acidified or unacidified with concentrated nitric acid. The acidified samples were used for elemental analysis such as Ca, Mg, Fe, Al, Mn, Ni, Cd, Cr, Cu, Pb, Zn, Co, Sr, Na, K, and Si by inductively coupled plasma – atomic emission spectroscopy (Thermo Jarrell Ash PolyScan Iris Spectrometer). The unacidified samples were used for the analysis of major anions including nitrate (NO_3^-), sulfate (SO_4^{2-}), chloride, and phosphate by means of an ion chromatograph equipped with a conductivity detector (Dionex, Sunnyvale, CA). Aliquots of the unacidified samples were also used for the analyses of TOC and total inorganic carbon (TIC) by means of a total organic carbon analyzer (TOC–5000A, Shimadzu, Tokyo). The TIC was then converted to bicarbonate (HCO_3^-) or carbonate concentrations in groundwater.

An aliquot of the acidified groundwater sample was also used for the analysis of total U(VI) by means of a laser-induced kinetic phosphorescence analyzer (ChemChek, KPA-11). However, because of a relatively low U(VI) concentration and the interference (or quenching effects) of other groundwater constituents such as Cl^- and Ca^{2+} in groundwater, the samples were purified and preconcentrated using the UTEVA resin extraction columns (Eichrom, IL). Experimentally, an aliquot of groundwater sample (10–20 mL) was acidified with nitric acid to a minimum concentration of 3 M, in which uranyl (UO_2^{2+}) forms complexes with NO_3^- (Horwitz et al., 1992). The uranyl-nitrate complexes were subsequently sorbed by the UTEVA resin, leaving other groundwater constituents unsorbed (or in the leachate). The column was then leached with dilute HNO_3 (1 mM), in which uranyl-nitrate complexes are unstable (or dissociate) and therefore desorbed from the resin column. The dilute HNO_3 leachate (with uranium) was collected and analyzed for U(VI) content as described above, and the detection limit was better than 0.01 μg/L.

About 1.2 and 2.5 years after the Fe^0 barrier was installed, soil and iron core samples were collected in polyurethane tubes from the barrier and its adjacent fill materials and used for the analyses of surface morphology, mineral precipitation, uranium content, and microbial characteristics. The mineralogical characterization of the core materials was performed using X-ray diffraction (XRD) operated at 45 kV and 40 mA (Scientag XDS–2000 diffractometer, Sunnyvale, CA). To determine the mineral deposition, morphology, and elemental composition, the Fe^0 core samples were also carbon-coated with a Bio-Rad carbon sputter coater and immediately examined by means of a JEOL ISM-35CF scanning electron microscope (SEM) equipped with an energy dispersive x-ray analyzer (EDX) (Tokyo, Japan). Note that all core samples were stored in Ar-purged airtight PVC tubes before use so as to minimize oxidation.

Additionally, it is pointed out that the sample preparation and timing are critical because such minerals as green rusts are particularly sensitive to oxidation and drying methodologies, and details regarding sample preparation and analytical procedures can be found elsewhere (Gu et al., 2001; Phillips et al., 2001; Phillips et al., 2000).

III. BIOGEOCHEMICAL REACTIONS IN THE IRON REACTIVE BARRIER

Although the ultimate goal of constructing the Fe^0 reactive barrier is to retain or degrade target contaminants of concern in groundwater, it must be realized that a range of biogeochemical reactions occur simultaneously because Fe^0 reacts not only with contaminant chemicals but also with a number of natural groundwater constituents. As illustrated in Figure 2, corrosion of Fe^0 in groundwater generates soluble Fe^{2+} ions, dissolved H_2, and an increased groundwater pH. More important, corrosion of Fe^0 results in a low redox potential (or Eh) and provides excess electrons for the reduction of a number of redox-sensitive contaminant metal species (e.g., uranyl, pertechnetate, and chromate), chlorinated organic compounds, and other groundwater constituents (e.g., nitrate and sulfate). Depending on the site biogeochemical conditions, these reactions are of great importance because they not only affect on the reactivity and long-term performance of Fe^0 to retain or remove contaminants, but also determine the rate of Fe^0 corrosion and, hence, the life span of the permeable Fe^0 reactive barrier.

III.A. Groundwater pH, Eh, and Ferrous Ion

Corrosion of Fe^0 in groundwater follows two general pathways. In the presence of dissolved oxygen, Fe^0 corrodes according to the reaction

$$Fe^0 + H_2O + \frac{1}{2}O_2 \rightarrow Fe^{2+} + 2OH^- . \qquad (1)$$

However, under anaerobic conditions (e.g., oxygen consumed by the above reaction or by anaerobic microorganisms), Fe^0 can react with water according to:

$$Fe^0 + 2H_2O \rightarrow Fe^{2+} + H_2 + 2OH^- . \qquad (2)$$

Both of these reactions result in a decreased redox potential but an increased solution pH as 2 moles of OH^- are formed per mole of Fe^0 oxidized. As shown in Figure 3, the site groundwater pH (upgradient) is generally stabilized at ~6.5. However, upon reaction with Fe^0 in the barrier, groundwater pH within the Fe^0 increased and stabilized at from ~7.5 up to ~10 under field conditions. On the other hand, groundwater pH remained at ~6.5 in downgradient wells (except those in the Fe^0 barrier, DP-23s,m), and corrosion of Fe^0 in the barrier appeared to have little impact on the downgradient soil based on observed pH values (Figure 3). This observation may be attributed to the relatively high pH-buffering capacity of clay minerals and organic matter in downgradient soil. The groundwater pH in monitoring well from TMW-7 appeared to be somewhat high (up to ~9.5) because this well is situated in the gravel trench downgradient of the Fe^0 barrier, that is low in pH-buffering capacity.

Groundwater redox potential (Eh), however, decreased dramatically in those monitoring wells both within and downgradient of the Fe^0 barrier (Figure 4). Although the site groundwater is generally aerobic, with Eh values mostly positive (over +200 mV) (Figure 4 upgradient), a generally low Eh was observed within the Fe^0 barrier (<–200 mV). This decrease in Eh may directly result from the consumption of dissolved O_2 and the production of dissolved H_2 as groundwater reacted with Fe^0 in the reactive zone. The Eh values were also in the negative range in most of the downgradient monitoring wells. Note that a low Eh was also observed in the upgradient TMW-11 and DP-22s monitoring wells because the DP-22 well is also located within the Fe^0 barrier and the TMW-11 is located adjacent to the Fe^0 barrier. The use of Guar gum

could also have resulted in an increased anaerobic microbial activity (Gu et al., 2001) and thus may have contributed to a low redox potential in the TMW-11 monitoring well.

Ferrous iron (Fe^{2+}), one of the major byproducts of Fe^0 corrosion in groundwater, may have a significant impact on water quality and cause clogging of soil porous structure as it oxidizes and precipitates out in the downgradient barrier or the soil. In fact, discharge of Fe^{2+} to Bear Creek had been one of the major concerns initially regarding the implementability of Fe^0 barriers at the site. However, we found that Fe^{2+} concentrations in groundwater were relatively low after a few months of operation of the Fe^0 barrier in the field (Figure 5). Initially, the Fe^{2+} concentration was found to be extremely high (up to ~150 mg/L) in the center well (TMW-9) of the Fe^0 barrier, and total iron concentration reached levels as high as ~700 mg/L (data not shown). Relatively high Fe^{2+} concentrations were also observed in the pea gravel section adjacent to the Fe^0 barrier for TMW-7 and TMW-11 (Figure 6). However, Fe^{2+} concentrations decreased rapidly over the first few months after the Fe^0 barrier was installed (such as in the TMW-9 and TMW-7 wells). Only a few monitoring wells within the Fe^0 barrier showed a slightly high Fe^{2+} concentration but was <15 mg/L in general (e.g., DP-22s,m; DP-20s,m; DP-23s) (Figure 5). As will be discussed below, Fe^{2+} ions may be precipitated as FeS, $FeCO_3$, or be further oxidized as Fe^{3+}, which forms relatively insoluble iron oxyhydroxides in the Fe^0 barrier. These results suggest that Fe^{2+} discharge as a result of Fe^0 corrosion is not always a significant concern at this site. However, the rate of Fe^0 corrosion and the production of Fe^{2+} will depend on both groundwater pH and constituent concentrations, such as nitrate, sulfate, and bicarbonate, which accelerate the corrosion process (Agrawal and Tratnyek, 1996; Agrawal et al., 1995; Gu et al., 1999). Depending on the removal rates via precipitation and sorption, high concentrations of ferrous ion may persist under certain conditions.

The high initial Fe^{2+} and total iron concentrations observed in groundwater (Figure 5) may be attributed in part to the following factors: (1) a rapid initial oxidation of Fe^0 filings (particularly some fine iron particles) when they were emplaced into the groundwater; 2) the use of Guar gum and, subsequently, the addition of enzyme (used to break up the Guar gum), that resulted in a decreased groundwater pH in a short time period; and (3) increased microbial activity (or respiration), which may also contribute to an increased corrosion rate of Fe^0.

III.B. Reactions Between Nitrate and Fe^0

Groundwater at the barrier site is contaminated with relatively high levels of nitrate (NO_3^-) at ~20–150 mg/L at the Pathway 2 site; in some deep monitoring wells or piezometers, levels >1000 mg/L NO_3^- were observed as a result of the migration of deep contaminated groundwater and the upward vertical hydraulic gradients at the site. Within and in the vicinity of the Fe^0 barrier, however, the NO_3^- concentration were low to non-detectable (Figure 7), suggesting that NO_3^- was effectively degraded as the groundwater passed through the Fe^0 barrier. The nitrate concentrations were also found to be low or non-detectable downgradient of the Fe^0 barrier, including monitoring wells or piezometers TMW-7, DP-11, DP-14s, DP-15s, and many others that are not shown in Figure 6. Even in some upgradient monitoring wells or piezometers (adjacent to the Fe^0 barrier), a low NO_3^- concentration was observed in monitoring wells such as TMW-11 and DP-12. These observations suggest that NO_3^- is readily degraded in the reducing zone of influence by Fe^0 corrosion.

The reduction of NO_3^- observed in the downgradient and some upgradient monitoring wells may be partially attributed to denitrification by microorganisms. As reported previously (Gu et al., 2001), an enhanced anaerobic microbial population was observed in soils both downgradient and upgradient of the Fe^0 barrier. This was presumably related to a low Eh and an

increased level of dissolved H_2 in groundwater (a byproduct of Fe corrosion), which served as electron donors for the microbial reduction of NO_3^-. However, direct abiotic reduction of NO_3^- by Fe^0 filings should not be ruled out within the Fe^0 barrier (Gu et al., 1997; Huang et al., 1998).

In laboratory, the reduction of NO_3^- and its associated byproducts by Fe^0 filings was evaluated in the presence or absence of peat materials and/or denitrifying bacteria. Results indicated that nitrate was effectively reduced by Fe^0, despite a relatively high initial NO_3^- concentration (6000 mg/L) used in these laboratory batch experiments (Figure 7a). The degradation half-life by Fe^0 alone was found to be on the order of ~1–2 weeks by assuming a pseudo-first-order reaction kinetics, and more than 60% of NO_3^- was degraded after about 2 weeks of reaction. The addition of peat materials (from Wards Scientific) was found to enhance the reduction rate of NO_3^-, with a decreased reaction half-life on the order of ~2 days. More than 95% of the NO_3^- was degraded in a 1-week period. However, note that the reduction rates did not increase significantly with the addition of a toluene-degrading denitrifying bacterium, *Azoarcus tolulyticus* Tol-4, into the Fe^0 and peat mixture (Chee-Sanford et al., 1996). In fact, addition of this denitrifying bacterium directly into Fe^0 filings did not increase the denitrification either, probably because of a high NO_3^- concentration and a relatively high pH condition (up to ~10) in the reactant solutions or an unfavorable environment for microbial reduction of NO_3^-. The presence of peat (with indigenous microbes in the peat), however, buffered the pH of the reactant solution (pH <8.5) so that a substantially enhanced NO_3^- reduction rate was observed under these conditions. Nevertheless, results of these laboratory experiments are consistent with the field monitoring results and demonstrate that Fe^0 is an effective reactive medium for removing NO_3^-, in addition to degrading chlorinated organics and sequestering some redox-

sensitive metals or radionuclides, as reported previously (Blowes et al., 1997; Cantrell et al., 1995; Gillham et al., 1994; Gu et al., 1998; McMahon et al., 1999).

The reaction byproducts between NO_3^- and Fe^0 and peat mixtures were also examined. The results (Figure 7b) indicate that a portion of NO_3^- (~25%) was converted to ammonia (NH_4^+) in the aqueous solution, and a large percentage of NO_3^- may have been degraded as N_2 or N_2O gases. A good mass balance was not obtained in these batch kinetic experiments, largely because of the loss of N_2 and N_2O gases to the headspace or atmosphere.

III.C. Sulfate Reduction

A decreased concentration of sulfate (SO_4^{2-}) also was observed within the Fe^0 barrier. As illustrated in Figure 8, sulfate was the highest in the upgradient soil and pea gravel portion of the barrier. Upon entering the Fe^0 portion of the trench, sulfate was found to be substantially reduced at all levels. For example, at the multi-level monitoring wells of DP-19 and DP-20, the SO_4^{2-} concentrations were significantly lower than those in the upgradient wells. In particular, sulfate was largely removed or degraded in some of the downgradient monitoring wells in soil (e.g., DP-14s), in iron (DP-23s,m), and in gravel (TMW-7). These observations provide evidence of sulfate reduction in the zone of Fe^0 influence, although the mechanisms of sulfate reduction are still a subject of investigation. These observations are also consistent with previous studies that show that groundwater SO_4^{2-} concentrations decreased through the Fe^0 barriers at the Moffett Field and Lowry AFB sites, at the Elizabeth City, U.S. Coast Guard site (Puls et al., 1999), and in the laboratory-simulated column studies with a continuous input of SO_4^{2-} and HCO_3^- solutions (Gu et al., 1999).

The reduction of SO_4^{2-} resulted in the formation of sulfide (S^{2-}), although much of the sulfide produced may have been rapidly precipitated as FeS because of its low solubility (K_{sp} on

the order of 10^{-18}). This explains a relatively low S^{2-} concentration observed in most of the monitoring wells (data not shown). Nevertheless, sulfide concentrations were found to be somewhat higher in those monitoring wells adjacent to the iron (TMW-11 and TMW-7) and within the iron barrier (TMW-9) than in those monitoring wells upgradient of the Fe^0 barrier (TMW-12 and DP-12). The exact mechanism of SO_4^{2-} reduction to S^{2-} is not yet clear because there is no direct evidence showing an abiotic reduction of SO_4^{2-} by Fe^0, although reduction of sulfonic acid to S^{2-} by Fe^0 has been reported (Lipczynska-Kochany et al., 1994). However, a decreased SO_4^{2-} concentration in the barrier could be at least partially attributed to reduction by sulfate-reducing microorganisms (Gu et al., 2001).

Using phospholipid fatty acids (PLFA) and DNA analyses (Dowling et al., 1986; Guckert et al., 1986; Tunlid and White, 1991; Zhou et al., 1996), an increased microbial population was observed within and in the vicinity of the Fe^0 barrier. The microbial population was found to be on the order of 10^5 to 10^6 cells/mL groundwater, which is substantially higher than that found in the background soil, located ~50 ft upgradient of the Fe^0 barrier (Gu et al., 2001). More importantly, perhaps, diversified microbial communities were also detected in groundwater by examining the characteristic PLFA profiles or lipid biomarkers although PLFA analysis is unable to identify the specific functional groups of microorganisms. Many microbial species may have similar PLFA patterns. Therefore, DNA analysis based on polymerase chain reactions (or PCR analysis) was used to further identify different functional groups of microorganisms. As reported previously, sulfate-reducing bacteria appeared to be one of the most abundant microorganisms identified in both groundwater and core samples obtained within and in the vicinity of the Fe^0 barrier. Both sulfate-reducing and denitrifying bacteria were found to be the highest in TMW-11 (upgradient adjacent to the Fe^0 barrier) and DP-11 (~3 ft downgradient of the Fe^0 barrier). These

observations provide additional evidence that a decreased SO_4^{2-} concentration within the Fe^0 portion of the trench could be a result of microbial reduction of SO_4^{2-} to S^{2-} under anaerobic conditions. Hydrogen generated by the corrosion of Fe^0 (and the initial use of Guar gum for trench excavation) could have played a significant role in stimulating the growth of these anaerobic microorganisms (Gu et al., 1999).

III.D. Interactions Between Fe^0 and Contaminant Metals

III.D.1. Uranium Removal

At the Y-12 site, uranium is the main driver for this groundwater remediation using the permeable Fe^0 reactive barrier because uranium poses the major potential health and environmental risks within Bear Creek Valley. Its concentration trends within and in the vicinity of the Fe^0 barrier are plotted in Figure 9 for some monitoring wells and piezometers. Results indicate that uranium is effectively removed within the Fe^0 barrier, and that uranium concentrations in the Fe^0 barrier (e.g., TMW-09, DP-19s,m, and DP-20s,m) were generally very low (<0.01 mg/L) in comparison with uranium concentrations in the upgradient monitoring wells. Low amounts of uranium were also found in the downgradient wells (e.g., DP-23s,m, DP-10, and DP-14s, TMW-7), suggesting that the Fe^0 barrier is performing well in removing or retaining uranium from the contaminated groundwater. Similarly, uranium concentrations in other monitoring wells and piezometers (such as DP-18s,m,d; DP-21s,m; DP-22s) were found to be low or below the detection limit in the Fe^0 barrier (data not shown). These observations are therefore consistent with previous laboratory studies that show uranium can be effectively and rapidly reduced by Fe^0 filings (Gu et al., 1998).

Uranium retention by Fe^0 filings was also evidenced by the analysis of uranium content in Fe^0 core samples (Figure 10). These angled cores were collected ~15 months after installation

of the Fe^0 barrier, and detailed sample preparation and analysis were given elsewhere (Phillips et al., 2000). Although only trace quantities of uranium are present in the contaminated groundwater, an elevated amount of uranium was detected in the Fe^0 core materials, particularly in those samples near the interface (between the soil and Fe^0 filings) where groundwater enters the Fe^0 barrier. The greatest concentration of uranium in the Fe^0 barrier occurred at the shallow, upgradient interface, but uranium concentration decreased dramatically over a short distance. These observations suggest that once uranium enters the Fe^0 reactive barrier it is rapidly sequestered in situ as a result of either reductive precipitation of relatively insoluble U(IV) species or surface adsorption of U(VI) species on the Fe^0 corrosion products (e.g., iron oxyhydroxides) (Cantrell et al., 1995; Gu et al., 1998).

Reductive precipitation of U(VI) to U(IV) species by Fe^0 is believed to be one of the dominant mechanisms for uranium removal and is thermodynamically favorable, according to the following stoichiometric reactions (Baes and Mesmer, 1976; Gu et al., 1998; Morse and Choppin, 1991):

$$Fe^{2+} + 2e^- \rightarrow Fe(0) \qquad \varepsilon^o = -0.440\ V \qquad (3)$$

$$UO_2^{2+} + 4H^+ + 2e^- \rightarrow U(IV) + 2H_2O \qquad \varepsilon^o = +0.327\ V \qquad (4)$$

$$\text{or} \qquad \varepsilon = -0.07\ V \text{ at pH } 8.$$

The reduced U(IV) readily forms oxyhydroxide precipitates in aqueous solution. Such a reductive reaction mechanism has been evaluated by laboratory batch equilibrium studies and by sensitive fluorescence spectroscopic analysis (Gu et al., 1998). The fluorescence spectra gave direct evidence of U(VI) reduction by Fe^0 because the reduced U(IV) species do not fluorescence. The batch equilibrium studies provided additional evidence because, regardless of the initial added uranium concentration in solution (up to 20,000 mg/L), no detectable amounts of uranium were found in the equilibrium solutions after reaction with Fe^0. These results are

indicative of reductive precipitation process rather than a simple sorption process, in which uranyl distributes or partitions between the solution and solid phases depending on the adsorption affinity and capacity on the adsorbent surfaces. On the other hand, sorption by iron oxides and other adsorbent materials was found to be much less effective than Fe^0 filings in removing uranium from the solution. A much higher-equilibrium U(VI) concentration was observed in samples treated with these materials than in those treated with Fe^0 filings. Using the X-ray photoelectron spectroscopy (XPS) technique, Fiedor et al. (1998) also reported that U(VI) was readily reduced to U(IV) species (~75%) by reacting with an Fe^0 coupon under anaerobic conditions, although a large solution to Fe^0 ratio was used in these laboratory studies.

However, as the corrosion products of Fe^0, such as iron oxyhydroxides, accumulate on Fe^0 surfaces, uranium removal through sorption or co-precipitation could not be ruled out (Fiedor et al., 1998; Gu et al., 1998; Hsi and Langmuir, 1985; Morrison et al., 1995). Unfortunately, because of a relatively low amount of uranium retained by the Fe^0 filings and a possible reoxidation of reduced U(IV) species during sample preparation and extraction, no attempts were made to distinguish whether uranium was reductively precipitated or sorbed by iron oxyhydroxides in these Fe^0 barrier materials. On the basis of previous laboratory studies (Cantrell et al., 1995; Fiedor et al., 1998; Gu et al., 1998), a speculation is that a majority of uranium could have been retained by the reductive precipitation process because of a strong reducing environment within the Fe^0 barrier (with a high solid to solution ratio). Understanding of U(VI) removal mechanisms through either reductive precipitation or sorption/co-precipitation has important environmental implications because the reduced U(IV) species on Fe^0 surfaces could be potentially re-oxidized when it is exposed to the air or dissolved O_2 in a matter of a few

hours or days (Gu et al., 1998). Similarly, the sorbed U(VI) species could be desorbed and therefore remobilized as groundwater geochemistry changes.

III.D.2. Pertechnetate and Chromate Reduction

The effectiveness of the Fe^0 barrier in removing other contaminant metals such as pertechnetate (TcO_4^-) and chromate (CrO_4^{2-}) was also monitored, although they are not major contaminants of concern because of their low concentration in the site groundwater. Technetium (as TcO_4^-) is a radioactive β-emitter with an extremely long half-life (2.1 x 10^5 years), and chromate is a hazardous heavy metal. Results indicate that TcO_4^- was also effectively retained by the Fe^0 barrier and that generally less than 40 pCi/L (or ~2 ng/L) of ^{99}Tc was detected in those monitoring wells within or adjacent downgradient of the Fe^0 barrier. The influent groundwater (in upgradient monitoring wells) contained ~600 pCi/L of TcO_4^-. The chromate concentrations in the upgradient and downgradient groundwater were mostly below the detection limit. As with the U(VI) species, the mechanisms of TcO_4^- and CrO_4^{2-} removal by Fe^0 filings are attributed to a reductive precipitation process, which was confirmed in laboratory batch kinetic studies (Figure 11). As Fe^0 corrodes in water, CrO_4^{2-} can be reduced to Cr^{3+}, which is easily hydrolyzed and precipitated as $Cr(OH)_3$. Similarly, TcO_4^- is reduced to TcO_2 or $Tc(OH)_4$ as precipitates. The reduction kinetics of these contaminant metals or radionuclides appears to be extremely fast, and nearly 100% of UO_2^{2+}, TcO_4^-, and CrO_4^{2-} was removed after they contacted Fe^0 in water in a short time period (Figure 11). The reductive precipitation or removal of CrO_4^{2-} has also been reported previously in the Fe^0 reactive barrier used to remediate groundwater contaminated with CrO_4^{2-} and trichloroethylene at the U.S. Coast Guard site, at Elizabeth City, NC (Blowes et al., 1997; Puls et al., 1999).

III.E. Interactions with Calcium and Carbonates

The groundwater at the barrier site contains high concentrations of both Ca^{2+} and bicarbonate because of the presence of calcium-rich bedrock, the calcareous Nolichucky shale, and strong nitric acid leachate from the S-3 Ponds, and because of the neutralization of the acid wastes by limestone in 1984. An analysis of groundwater carbonate/bicarbonate and Ca^{2+} indicates that these groundwater constituents were partially retained or precipitated within the Fe^0 barrier (Figures 12 and 13). As shown in Figure 12, Ca^{2+} concentrations in the upgradient side of the Fe^0 barrier (e.g., TMW-11, TMW-12, DP-12 and DP-13) appeared to be relatively constant (between ~120 and 200 mg/L). However, the Ca^{2+} concentrations within the Fe^0 barrier from TMW-9, DP-19, and DP-20 monitoring wells were about an order of magnitude lower than those found in the upgradient monitoring wells, suggesting that Ca^{2+} was retained by the Fe^0 barrier. A relatively low Ca^{2+} concentration also was observed in many of the downgradient monitoring wells (e.g., DP-23s,m, TMW-7, and DP-14s).

Examination of carbonate/bicarbonate concentrations in groundwater revealed that these constituents also were partially removed (Figure 13), suggesting that calcium carbonate precipitation is probably one of the dominant mechanisms responsible for decreased concentrations of Ca^{2+} and bicarbonate in groundwater. These results can be expected because of an increased groundwater pH as Fe^0 corrodes in the barrier and a resulting shift from bicarbonate to carbonate species in the groundwater. As has been reported previously, an increased pH and relatively high concentrations of Ca^{2+} and bicarbonate in the groundwater could have induced the chemical precipitation of Ca-carbonate and/or of a mixture of Fe- and Ca-carbonate and oxyhydroxide coprecipitates (Gu et al., 1999; Phillips et al., 2000). Similarly, by examining the concentration profiles of Mg^{2+} (data not shown), we found that Mg^{2+}

concentration within the Fe^0 barrier also decreased over time because it also could form carbonate precipitates or co-precipitates with iron oxyhydroxides (Phillips et al., 2000).

IV. HYDROLOGICAL AND MINERALOGICAL CHARACTERISTICS

IV.A. Hydraulic Properties and Connectivity in the Fe^0 Barrier

Hydraulic gradients across the Pathway 2 barrier site have remained relatively stable and consistent from east to west (magnitude of approximately 0.02). Figures 14a,b show a comparison of groundwater levels and flow directions on May 6, 1998 and on May 17, 2000, respectively. The results indicate that the general flow patterns at the site have not changed since the start of the installation of the trench. Groundwater monitoring results over the past 3 years also suggest that increases and decreases in the gradients across the reactive barrier site appear to be primarily related to recharge during precipitation events and seasonal fluctuations. The hydraulic gradient in the trench across the iron has also remained consistently from east to west (Figure 14) with an average gradient of approximately 0.008. The magnitude of the gradient changes during recharge events but the direction of groundwater flow has been consistently toward the west. However, closer inspection of gradient fluctuations within the trench and the Fe^0 barrier seem to indicate that cementation within the iron may be starting to impact groundwater flow through the iron. Figure 15 shows the groundwater elevations and gradients between 3 monitoring wells located in the Pathway 2 trench. Since the spring of 1999 (or ~500 days after the barrier was installed), recharge events appear to have a more pronounced impact on hydraulic gradients (or fluctuations) observed between wells located upgradient (TMW-11), within (TMW-9), and downgradient (TMW-7) of the Fe^0 barrier. These observations suggest that the connectivity of the iron and gravel in the upgradient portion of the trench to the iron and

gravel in the downgradient portion of the trench may be decreasing over time due to mineral precipitation and/or cementation in the Fe^0 barrier, as will be discussed in Sections IV.B below. Coincidentally, the nitrate concentrations in upgradient well TMW-11 and DP-22m (located the furthest upgradient but still in the Fe^0 barrier) have an increasing trend starting in the spring of 1999 (Figure 6). These data suggest that cementation of the iron in the upgradient portion of the trench may be causing a decrease in iron reactivity, hydraulic connectivity, and the beginning stages of system clogging.

IV.B. Mineral Precipitates and Their Occurrence

Iron corrosion in groundwater results in the formation of ferrous or ferric ions (when dissolved O_2 is present), which ultimately form iron oxyhydroxide mineral precipitates because of their low solubility (Figure 2). It is not surprising, therefore, that many investigators observed iron oxyhydroxides to be the predominant minerals found in the iron reactive barriers (Gu et al., 1999; Phillips et al., 2000; Pratt et al., 1997; Roh et al., 2000). Core samples were taken ~1.2 and 2.5 years after the Fe^0 barrier was installed, and X-ray diffraction (XRD) analysis revealed akaganeite (β-FeOOH) as the major iron mineral precipitant throughout the cores, while goethite (α-FeOOH) was present to a lesser extent (Phillips et al., 2000). Although they were not detected by the XRD analysis, amorphous iron oxyhydroxide deposits were also observed throughout the iron core materials by means of scanning electron microscope (SEM) and energy dispersive X-ray (EDX) spectroscopic analyses. Presumably, these amorphous iron oxyhydroxides gradually transform to crystalline akaganeite and goethite within the barrier. The formation of akaganeite may be related to a relatively high concentration of chloride in groundwater entering the trench, because, in laboratory studies, akaganeite is commonly

observed as the dominant mineral phase from precipitation of ferric chloride (Schwertmann and Cornell, 1991). The presence of goethite within the Fe^0 barrier instead of lepidocrocite, which has been reported in laboratory column studies (Gu et al., 1999), could result from relatively high dissolved O_2 and bicarbonate contents of the groundwater. It has been reported that the formation of goethite is favored over the formation of lepidocrocite when carbonates or CO_2 are present in the system (Schwertmann and Taylor, 1977).

Although to a lesser extent, green rusts were also observed as corrosion products in the Fe^0 barrier, and similar observations have been reported previously (Gu et al., 1999; Phillips et al., 2000; Roh et al., 2000). However, green rusts are not stable and can transform into crystalline iron minerals quickly when exposed to the air or subjected to oven drying. Therefore, care must be taken in sample preservation and preparation in order to observe green rusts in the iron barrier material (Phillips et al., 2001).

In addition to iron oxyhydroxide minerals, analysis of Fe^0 core materials indicated the presence of abundant calcium carbonates such as aragonite ($CaCO_3$) and siderite ($FeCO_3$) (Figure 16a,b). These results are consistent with decreased concentrations of calcium and carbonates in groundwater within and downgradient of the Fe^0 barrier, as shown in Figures 12 and 13. Crystalline aragonite was observed throughout the core materials of the Fe^0 barrier, and its structure and forms were identified by both SEM and EDX analyses (Figure 16a). As indicated previously, relatively high concentrations of Ca^{2+} and carbonates, coupled with a relatively high pH within the Fe^0 barrier, may be largely responsible for the precipitation of $CaCO_3$ minerals (Phillips et al., 2000; Roh et al., 2000).

The formation of ferrous carbonate (i.e., siderite) offers another mechanism for a decreased carbonate or bicarbonate concentration in the Fe^0 barrier. Ferrous iron is one of the

major byproducts of Fe^0 corrosion in groundwater; it is thus conceivable that the formation of siderite can be a favorable reaction when high amounts of carbonate are present in groundwater, particularly at a relatively high pH condition (Mackenzie et al., 1999). Figure 16b shows the SEM image of cubic-shaped siderite minerals in the Fe^0 barrier. As shown in Figure 13, bicarbonate contents from monitoring wells such as TMW-9 were particularly low and could be attributed largely to its precipitation with both Ca^{2+} and Fe^{2+} to form carbonate minerals. However, siderite precipitation was much less extensive than aragonite precipitation. The presence of siderite was detected only in patches in some of the iron core samples. Several factors may contribute to these observations. A relatively high pH and high carbonate but low Ca^{2+} concentrations favor the formation of siderite (Phillips et al., 2000). On the other hand, a relatively low pH (about neutral) and a low carbonate concentration shift the chemical equilibrium in favor of $Fe(OH)_2$ precipitation. High Ca^{2+} concentrations in groundwater may compete with Fe^{2+} for carbonate and form $CaCO_3$ minerals as described above.

Precipitation of amorphous ferrous sulfide (FeS) was detected by SEM-EDX in most of the core samples from the Fe^0 barrier (Figure 17). The morphology of FeS appeared to be rounded or bytrodial, and it was commonly observed as coatings on Fe^0 filings or other mineral deposits on iron surfaces. Many Fe^0 particles were completely encrusted in FeS, and these coated Fe^0 filings remained black (rather than rusty) after drying (by vacuum rinsing with acetone), especially those core materials obtained near the interface where groundwater enters the Fe^0 barrier (Phillips et al., 2000). Note that, although there appears to be a high occurrence of FeS, crystalline pyrite was not detected by XRD, perhaps because of the non-crystallinity of the FeS structure. As stated previously, FeS formation in the Fe^0 barrier may be largely attributed to the reduction of SO_4^{2-} to S^{2-} by sulfate-reducing bacteria under a highly reducing

environment in the Fe^0 barrier. Similar observations also have been reported in both laboratory simulated iron columns and field experiments with a relatively high influent sulfate concentration (Gu et al., 1999; Phillips et al., 2000). On the other hand, although reduction of SO_4^{2-} was observed in the Fe^0 barriers at the U.S. Coast Guard Support Center at Elizabeth city, NC, and at an industrial facility in upstate New York (Puls et al., 1999; Vogan et al., 1999), no appreciable amounts of FeS precipitates were observed. These observations may be related to a relatively low SO_4^{2-} concentration (<20 mg/L) present in the groundwaters at these sites.

IV.C. Implications for Long-Term Performance

The occurrence of a suite of mineral precipitates could have serious implications for the long-term performance of Fe^0 reactive barriers. Specifically, these mineral precipitates commonly exist as coating and cementing materials on Fe^0 surfaces. They not only reduce the reactivity of Fe^0 and thus its capacity to degrade or retain target contaminants of concern, but also cause the cementation and clogging of the reactive Fe^0 filings. Ultimately, they may result in reduced hydraulic conductivity or the diversion of groundwater through the barrier. However, site groundwater geochemistry and contaminant concentration may determine the rate and forms of mineral precipitant formation and thus the life span of the Fe^0 permeable reactive barriers. For groundwater of relatively low ionic strength, McMahon *et al.* (1999) estimated a 0.35% yearly loss of total porosity in the iron-reactive media at the Denver Federal Center site. On the other hand, a fast corrosion rate and mineral precipitant formation have been observed at the Oak Ridge Y-12 barrier site, where groundwater contains relatively high concentrations of bicarbonate, sulfate, nitrate, calcium, and magnesium. Isolated spots of clogged and/or cemented

Fe^0 media were observed only ~1.2 years after the installation of the Fe^0 barrier at the Oak Ridge site (Phillips et al., 2000).

Yet more extensive cementation and clogging of iron-reactive media were found in the iron core materials taken ~2.5 years after the installation of the Fe^0 barrier, particularly at the soil/barrier interfaces where groundwater enters the Fe^0 barrier. The cemented iron cores appeared to be hard to break (Figure 18a), and a close examination (by SEM) revealed an extensive iron corrosion and subsequent mineral precipitation on Fe^0 surfaces (Figure 18b). The SEM-EDX analysis of a polished cross-section of the cemented iron filings (Figure 19) indicated that iron oxyhydroxides were the primary mineral precipitates accumulated on or between individual iron particles as a thick rind (Phillips et al., 2000). These iron oxyhydroxides may therefore be largely responsible for the cementation of Fe^0 particles in the barrier. Similarly, Mackenzie *et al.* (1999) reported the portion of an iron column clogged with iron oxyhydroxides to be a hardened solid mass that greatly decreased hydraulic conductivity. Additionally, the precipitation and formation of aragonite and FeS minerals were also at least partially responsible for binding iron particles in cemented iron core samples (Figure 19). In particular, FeS precipitates exist primarily in the form of coatings on iron surfaces and thus may act as active binding agents as well. It is interesting to note the sequence of mineral precipitation on iron surfaces as viewed by SEM of the polished sections (Figure 19). Iron oxyhydroxides appeared to precipitate first as a corrosion product on Fe^0 surfaces. The formation of aragonite followed in response to an increased groundwater pH as a result of iron corrosion, and FeS precipitates then followed as coatings or void fillers on aragonite and iron oxyhydroxide surfaces. The initial delay in the formation of FeS compared with the other precipitates could perhaps be due to the

greater length of time needed for an accumulation of a microbial population to facilitate sulfate reduction in the barrier (Gu et al., 1999; Phillips et al., 2000).

Based on an average Fe^0 filing thickness of ~0.5 to 1.25 mm, Phillips *et al.* (2000) estimated that these Fe^0 filings could be completely corroded within ~5 to <10 years under the specific site geochemical conditions. This estimated life span of an iron reactive barrier is substantially shorter than the life spans that have been estimated previously, ~15 to 30 years (Gillham et al., 1994; Liang et al., 2000; McMahon et al., 1999), and may be explained by the fact that the site groundwater contains relatively high levels of NO_3^- and HCO_3^-, both of which are known to accelerate the corrosion of Fe^0 (Davies and Burstein, 1980; Gu et al., 1999; Huang et al., 1998). It is also important to note that mineral precipitation and iron cementation appeared to occur progressively with time. Within ~1.5 years, spotted cementations of Fe^0 filings were observed mostly at the interface where groundwater enters the Fe^0 barrier. Cementation extended and further developed downgradient of the Fe^0 barrier, as observed in the second coring event (~2.5 years after the barrier was installed). An important implication of these observations is that such an uneven distribution of iron corrosion and mineral precipitation could potentially result in early system clogging at the interface regions and therefore shorten the functional lifetime of in situ Fe^0 barriers. Therefore, close attention should be given to areas in the barrier that seem more vulnerable to corrosion, mineral precipitation, and subsequent cementation (e.g., where groundwater first enters the barriers). Particular attention should also be given to the geochemical composition and concentration in groundwater, which may largely determine the corrosion rate and thus the life span of the Fe^0 reactive barriers.

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Quarterly Data Summary
August to October, 2001
Permeable Reactive Wall
Interim Remedial Action, Northeast Corner Operable Unit

This document reports the results of quarterly groundwater monitoring for the permeable reactive wall (PRW) installed as part of the interim remedial action at the Northeast Corner Operable Unit (NECOU). Included in the report are monthly groundwater level measurements in the vicinity of the PRW for the quarter, and the analytical results for the quarterly sampling round of the 28 performance and compliance monitoring wells and additional background wells, conducted in September 2001. Also included are analytical results of two surface water samples collected from the stream that passes near the northeast end of the PRW. The location of the PRW and the performance and compliance monitoring wells are shown in Drawing 1.

1.0 FIELD ACTIVITIES

The third quarterly groundwater sampling event was conducted from September 17 through October 2, 2001. Groundwater samples were collected using low-flow sampling procedures described in the *Global Sampling and Analysis Plan* (IT Corporation, April 2000) per the task-specific requirements of the monitoring program as described in Section 7 of the *Interim Remedial Action Report* (IT Corporation, July 2001). The samples from performance and compliance monitoring wells were collected using dedicated QED Model MP10 bladder pumps with 120 ml internal capacity. A portable bladder pump of the same type was used for collection of background samples from PZ-2S, PZ-2D, PZ-3, and MW16-2. Grab samples of surface water were collected by directly filling the sample containers from the surface of the stream.

Groundwater was field-tested for the following parameters: pH, temperature, conductivity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity. These field parameters, as well as the depth to water and pump discharge rates, were recorded at intervals of approximately 3 minutes until the parameters stabilized, at which time groundwater samples were collected. Samples were collected and field-analyzed for ferrous and ferric iron. Groundwater samples were collected and submitted for laboratory analysis of dissolved organic carbon (DOC) using Standard Method 5310B and volatile organic compounds (VOCs) using EPA Method 8260B by Analytical Management Laboratories, Inc. (AML) in Lenexa, Kansas, following chain-of-custody procedures. At select locations, groundwater samples were also collected and analyzed for dissolved major cations (aluminum, barium, calcium, iron, magnesium, manganese, potassium, and sodium) using EPA Method 6010B, major anions (bromide, chloride, fluoride, nitrate, and sulfate) using EPA Method 300.0, and alkalinity (total, bicarbonate, carbonate, and hydroxide) using EPA Method 310.1. Records of the sampling event were maintained on well purge/sampling forms provided in Attachment A.

Grab samples of surface water were collected at two locations and submitted for laboratory analysis of VOCs by Analytical Management Laboratories, Inc. (AML) in Lenexa, Kansas, following chain-of-custody procedures.

2.0 WATER LEVEL DATA

Monthly groundwater level measurements were collected in the 20 compliance and 8 performance wells associated with the PRW and 15 selected wells located in the vicinity of the PRW in during the quarter. Repairs were made to the surface water weirs in the previous quarter, but subsequent erosion of the stream banks at the south weir location rendered the collected measurements unusable.

2.1 Groundwater Data

The depths to groundwater and groundwater elevations through November 2001 are summarized in Tables 1 and 2, respectively. Beginning in September 2001, water level measurements are made at all locations in the PRW vicinity in a one-day period for each monthly measurement round. Hydrographs representing temporal variations in the groundwater elevations are presented in Figures 1 through 3. Most of the performance and compliance wells exhibit relatively slight changes in water levels between recent measurements, although a small increase in elevations is generally evident in the two-month period from August to October 2001. This represents a reversal of a general trend of water level decline that had been noted between July and August 2001 measurements in the previous quarterly data summary.

Long profiles of groundwater elevations along traverses roughly perpendicular to the PRW and parallel to the regional hydraulic gradient from the uplands to the edge of the Lake City Aquifer are presented in Figures 4 and 5. Groundwater elevations decline approximately 13 feet in shallow overburden from PZ-2S to MW16-8 along a profile of more than 600 feet. In deep overburden along the same approximate distance, groundwater elevations decline approximately 25 feet from PZ-2D to MW16-9. From MW16-2 to MW16-15 along a profile of more than 700 feet, groundwater elevations in shallow overburden decline approximately 17 feet.

Figures 6 through 9 present profiles of October 2001 groundwater elevations through the PRW at approximate STA 0+50, 1+50, 2+45, and 3+25, respectively. Each profile extends approximately 15 feet in length, from the up-gradient compliance well cluster, through the PRW at the performance well cluster, to the down-gradient compliance well cluster. In October 2001, a decline in shallow groundwater levels of up to two feet was evident from an up-gradient compliance well to the corresponding in-PRW performance well at two of three monitored locations. A slight increase in shallow groundwater levels from up-gradient to in-PRW location was evident between CW4S and PW2S. Groundwater levels in the deep wells increased up to one foot from up-gradient to in-trench well over the same distance. Larger declines in groundwater levels are evident from the in-trench performance wells to the corresponding down-gradient compliance wells: up to seven feet in shallow wells and up to five feet in the deep wells.

The profiles of Figures 6 through 9 show that groundwater elevations in the shallow overburden at the up-gradient compliance wells are near the approximate ground surface elevation of 753 feet. These levels are elevated with respect to groundwater levels that were present before the installation of the PRW (e.g., elevations of 744 to 746 feet at PZ-1, MW16-22, and PZ-4S in July 2000).

Figures 6 through 9 also show that hydraulic head within the PRW is redistributed relative to the strong downward gradients that are prevalent in the overburden upgradient of the PRW. Heads

are approximately two to four feet higher in shallow overburden versus deep overburden in the up-gradient compliance wells. In comparison, three of the four shallow/deep performance well pairs within the PRW exhibit heads within 0.3 foot of each other (the PW2S/PW2D pair is the exception with 1.8 feet of difference). Differences in shallow/deep overburden heads in the down-gradient wells are variable. A comparison of three profiles parallel to the PRW support these relationships; i.e., strong downward gradients up-gradient (southeast) of the PRW (Figure 10), greatly reduced vertical gradients within the PRW (Figure 11), and variable vertical gradients down-gradient (northwest) of the PRW (Figure 12).

Maps of the potentiometric surface for the shallow and deep overburden are illustrated in Drawings 2 and 3, respectively. The horizontal component of groundwater flow is generally to the northwest, approximately normal to the PRW and Buckner Road. As shown in the drawings, groundwater flow is influenced by the presence of the PRW. Up-gradient of the PRW, the horizontal component of the hydraulic gradient is relatively low, e.g., 0.010 (based on elevations at PZ-2S, CW2S, CW6S, and CW6D) and 0.020 (based on elevations at PZ-2D, CW2D, CW6D, and CW6S). Down-gradient of the PRW, the horizontal gradient ranges to higher values, e.g., 0.014 (based on elevations at MW16-15, MW16-14, MW16-8, and CW7S), and 0.038 (based on elevations at MW16-15, MW16-14, MW16-9, and CW7D). The vertical component of the hydraulic gradient between shallow and deep overburden is generally much greater than the horizontal component, e.g., 5 to 14 times greater for the four sets of wells discussed above.

2.2 Surface Water Data

Two V-notched weirs are located in the stream located to the east of the PRW. A comparison of flows measured at the two weirs located up and down stream of the PRW can provide an estimate of potential inflow of groundwater to this reach of the stream. Water levels in the stream were measured on a daily basis during construction of the PRW using the stream gauges attached to the weirs. In general, the weirs measured a net increase in flow at the downstream weir following periods of precipitation and a net decrease in flow during low flow conditions. A summary of the stream water levels and flow is provided in Table 3 and illustrated in Figure 13.

Usable data from both weirs for the period since August 2000 are not available. Erosion of the stream channels occurred at both locations during this period, preventing accurate measurement of flow. During the previous quarter, the weirs were reset within the stream channel and staff gauges were replaced. Subsequent erosion of the stream banks at the south weir location rendered the collected measurements unusable.

3.0 CHEMICAL DATA

Groundwater samples were collected from 20 compliance wells, 8 performance wells, and two background wells. Groundwater samples were measured in the field for specific parameters necessary for the evaluation of the performance of the PRW in addition to the samples submitted for laboratory analyses.

3.1 Field Parameters

Field parameters measured using field instrumentation at the time of sample collection are provided in Attachment A and summarized in Table 4. The pH in the up-gradient and cross-

gradient compliance wells ranged from 8.7 to 9.8 in the third quarter (Figure 14), generally higher than pH measurements from the second quarter of 7.1 to 8.4. The pH in the performance wells within the PRW generally ranged from 11.3 to 12.5. High pH is associated with the reducing groundwater conditions induced by the zero-valent iron. A lower pH measurements were obtained, however, from performance well PW-2S (9.4). Low iron content has been found in samples of treatment media from the location of this performance well (approximate STA 1+50). The pH in down-gradient compliance wells was variable, ranging from 8.6 to 12.4, reflecting the transitional nature of groundwater a few feet down-gradient of the PRW.

ORP in groundwater exhibits the influence of the PRW in a similar manner to pH (Figure 15). Oxidizing to slightly reducing conditions are generally present in upgradient and cross-gradient wells (-74 to 124 mV), while strongly reducing conditions are generally found in the performance wells within the PRW (-311 to -71 mV, with the exception of PW4D at 93 mV). The redox state of groundwater from down-gradient compliance wells is variable (-247 to 16 mV).

3.2 *Inorganic Chemistry*

Field measurement of ferrous and ferric iron in groundwater is conducted quarterly. As summarized in Table 4 and Figure 16, the iron content of groundwater samples was generally low, particularly in terms of ferric iron. Within the PRW, ferrous iron was generally also very low, with the exception of the sample from PW2S.

Major cations and anions were analyzed for groundwater samples from the wells in the monitoring transects at approximate STA 1+50 and STA 2+50 during the third quarterly monitoring round. Concentrations of major cations and anions are presented in Table 5 and Figure 17. Moderate to slight decreases in alkalinity, calcium, and magnesium occurred between the upgradient and respective downgradient sample locations. Slight increases in chloride and sulfate concentrations occurred at some locations.

3.3 *Dissolved Organic Carbon*

Groundwater samples were collected from the 20 compliance wells and 8 performance wells and analyzed for dissolved organic carbon (DOC) using Standard Method 5310B. Background samples were also collected and analyzed from monitoring well MW16-2 and piezometer PZ-3.

Groundwater samples were analyzed for DOC to evaluate the distribution of organic matter potentially remaining from the use of biopolymer slurry during construction of the PRW. The DOC concentrations are summarized in Table 6. Many of the reported DOC values are elevated in comparison to the reported values for samples from same locations in previous sampling events. The increase in reported DOC this round includes the two background samples, from MW16-2 and PZ-3. The laboratory has indicated that new analytical equipment was utilized for analysis of DOC during this monitoring round. At the time this report is being submitted, the elevated DOC concentrations are believed to be influenced by incomplete removal of inorganic carbon by the new analytical equipment. IT and the lab will continue to evaluate the analytical procedures and results. If necessary, a corrective action will be developed and submitted for review prior to the 4th quarter sampling.

3.4 Volatile Organic Compounds

Groundwater samples were collected from the 20 compliance wells and 8 performance wells and analyzed for VOCs including ketones and methyl tert-butyl ether (MtBE) using EPA Method 8260B. The groundwater samples were placed in 40-ml vials, preserved with hydrochloric acid, and placed on ice for shipment. Total VOC concentrations are summarized in Table 6 and shown in Drawing 4.

VOC concentrations in the up-gradient compliance wells (Figure 19) are less than the maximum assumed influent concentrations assumed in the design of the PRW. The maximum observed trichloroethene (TCE) concentration in up-gradient compliance wells was 315 ug/L at CW4D versus 1000 ug/L assumed in the design, maximum observed cis-1-2-dichloroethene (DCE) concentration was 95.6 ug/L at CW4D versus the assumed 740 ug/L, and the maximum observed tetrachloroethene concentration was 5.47 ug/L at CW4D versus the assumed 53 ug/L.

The cross-gradient compliance wells located at the southwest end of the PRW, CW1S and CW1D, contained few detectable VOCs, including vinyl chloride in CW1D at a concentration of 1.24 ug/L versus a remediation goal of 2 ug/L. The samples from the wells at the northeast end of the PRW, CW9S and CW9D, contained total VOCs in concentrations of 65 ug/L and 71 ug/L, respectively. The sample from CW9S contained TCE at a concentration of 31.1 ug/L, in excess of its remediation goal of 5 ug/L (Figure 20).

Few VOC detections were found in samples of groundwater from the in-PRW performance wells (Figure 20). One sample, from PW-3D, contained vinyl chloride at a concentration of 1.7 ug/L, slightly below the remediation goal of 2 ug/L.

Concentrations of TCE exceeded the remediation goal of 5 ug/L in four downgradient compliance wells, with a maximum of 180 ug/L at CW7D (Figure 21). The groundwater sample from CW7D also contained cis-1,2-DCE (at 245 ug/L) and vinyl chloride (at 53.2 ug/L) in excess of remediation goals (70 and 2 ug/L, respectively). It is anticipated that several quarters will pass before groundwater concentrations at the locations of the down-gradient compliance wells (CW3S/3D, CW5S/5D, and CW7S/7D/7B) approach remediation goals. With the exception of CW7D, slight declines are evident in TCE concentrations between the second and third quarterly events in the down-gradient and cross-gradient compliance wells (Figure 22).

Surface water samples were collected from two locations along the ephemeral stream east of the PRW (Drawing 2). Location SW16-01 is located at the south weir, approximately 300 feet upstream of the PRW. Location SW16-02 is located approximately 40 feet downstream (northwest) of the PRW alignment. Both samples contained VOCs. The upstream sample, SW16-01, contained total VOCs at a concentration of 41 ug/L, including vinyl chloride at 3.7 ug/L (exceeding the remediation goal of 2 ug/L). Total VOCs were lower in the downstream sample, SW16-02, with a concentration of 24 ug/L. The concentrations of individual compounds were also lower in the downstream sample, with the exception of TCE at 8.37 ug/L (exceeding the remediation goal of 5 ug/L).

4.0 SUMMARY

Surface Water

The stream located to the east of the PRW is an ephemeral stream that receives surface runoff from portions of Area 16, Area 17 and Area 11. The flow in the reach of the stream adjacent to the PRW generally has a net increase following periods of precipitation and shows a net decrease in flow during low flow conditions, as observed during the PRW construction. This is characteristic of an ephemeral stream. The total flow increases down stream following periods of precipitation as additional surface water inflow and groundwater released from bank storage contributes to the total stream flow. Conversely, flow decreases downstream during periods of low flow as water is lost due to direct infiltration.

Groundwater

Groundwater levels in the performance and compliance monitoring wells have generally approached steady-state conditions following construction of the PRW. The large-scale distribution of heads is consistent with conditions observed prior to construction of the PRW, with intermediate groundwater elevations at the PRW relative to high groundwater elevations in the upland area southeast of the PRW and lower groundwater elevations within the Lake City Aquifer northwest of the PRW (Figures 4 and 5).

The groundwater elevations within the overburden are elevated upgradient of the PRW with respect to pre-construction conditions. Elevations in the shallow overburden upgradient of the PRW are at the approximate elevation of the ground surface (753 feet), and elevations within the shallow and deep performance wells within the PRW are within three feet of the ground surface at most locations (Figures 6 through 11).

The water levels near the PRW suggest that the hydraulic conductivity within or near the PRW is lower than had been anticipated, with the resulting impedance to groundwater flow resulting in the elevated groundwater levels upgradient of the PRW. Although the cause of this condition is not known, possibilities may include:

- The presence of long-chain carbohydrates from incompletely broken biopolymer slurry within the pore spaces of the PRW and/or adjacent overburden
- The presence of biomass within pore spaces of the PRW and/or adjacent overburden resulting from microbial activity in the presence of the carbohydrate source remaining from the biopolymer slurry
- The accumulation of mineral precipitates within the leading edge of the PRW potentially reducing the hydraulic conductivity of the treatment media.
- The presence of fine sediment within pore spaces of the PRW treatment media during or following construction.
- Smearing of clayey soils along the faces of the PRW excavation.

Chemistry

The first three quarterly rounds of groundwater chemistry data indicate that concentrations of groundwater entering the PRW are consistent with the influent concentration ranges assumed in the design, and that contaminants are degrading within the PRW. Unlike previous rounds, no exceedances of remediation goals occurred in groundwater samples collected during the third quarter from in-PRW performance wells.

High concentrations of VOCs in the downgradient compliance wells appear to be artifacts from pre-construction site conditions. This is supported by lower VOC concentrations in the corresponding performance wells. Concentrations of VOCs in groundwater from the downgradient and cross-gradient compliance wells will be compared to the results of future rounds. In particular, changes in VOC concentrations at the PW9S/9D northeast cross-gradient cluster will be considered to assess whether the presence of VOCs is a possible reflection of pre-existing conditions at this location or the result of flow around the end of the PRW.

VOCs were detected in the surface water samples from the ephemeral stream. The total VOC concentration was lower in the downstream sample (near the PRW), than in the upstream sample.

DRAWINGS

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
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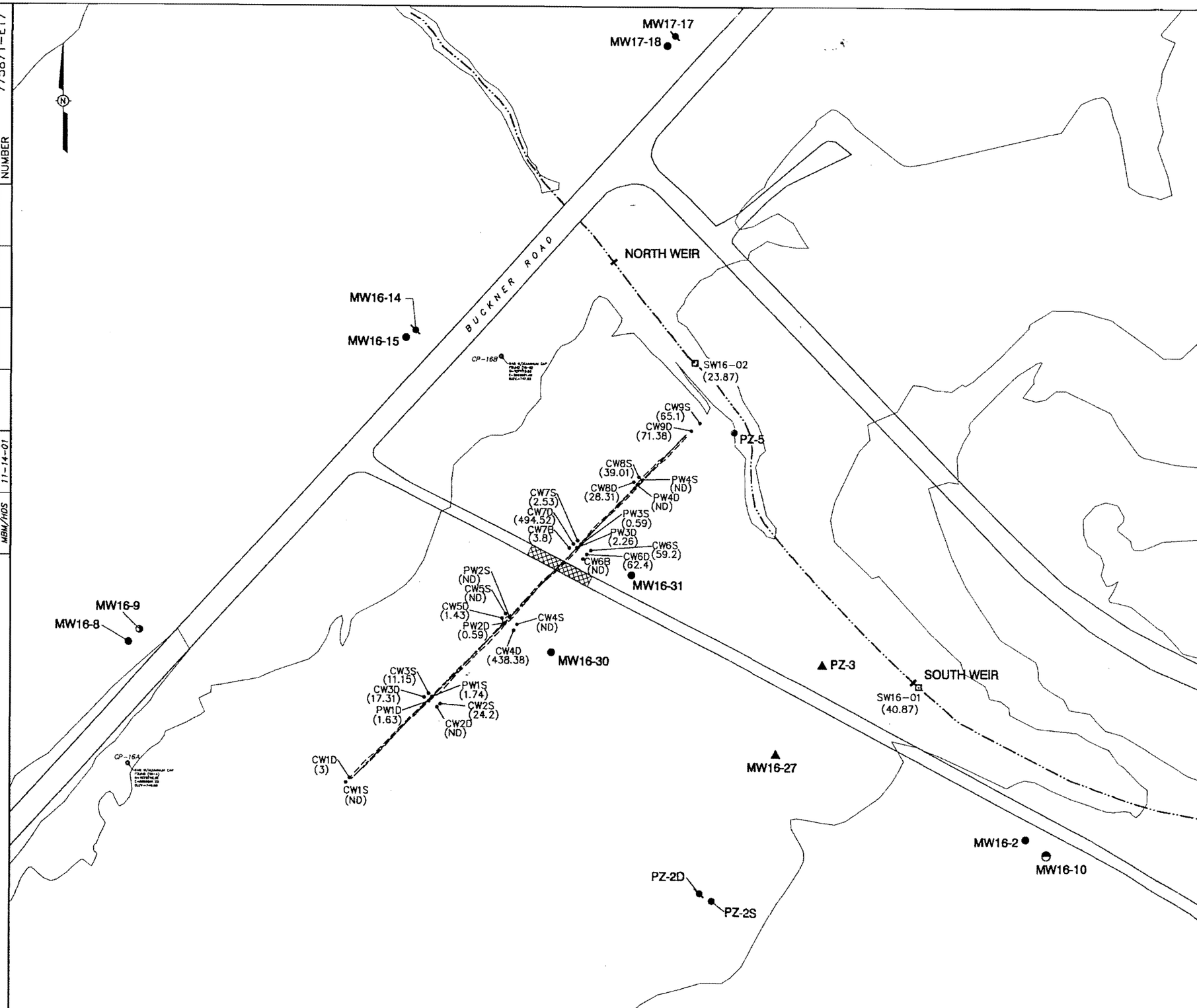


LEGEND

- SHALLOW OVERBURDEN WELL
- INTERMEDIATE OVERBURDEN WELL
- DEEP OVERBURDEN WELL
- FULLY SCREENED OVERBURDEN WELL
- BEDROCK WELL
- CW2 COMPLIANCE WELL
- PW2 PERFORMANCE WELL
- SURFACE WATER SAMPLE LOCATION
- (S/D/B) SHALLOW/DEEP/BEDROCK
- TOP OF PRW ZERO VALENT IRON/SAND TREATMENT MEDIA AT APPROXIMATELY THE 748-FOOT ELEVATION
- PRW CENTERLINE AT DEPTH
- (748.53) VOC CONCENTRATION (µg/L)
- (ND) NOT DETECTED
- GEOTEXTILE FABRIC
- LOCATION OF WEIRS ARE APPROXIMATE
- EPHEMERAL STREAM

SCALE
0 40 80 120 FEET

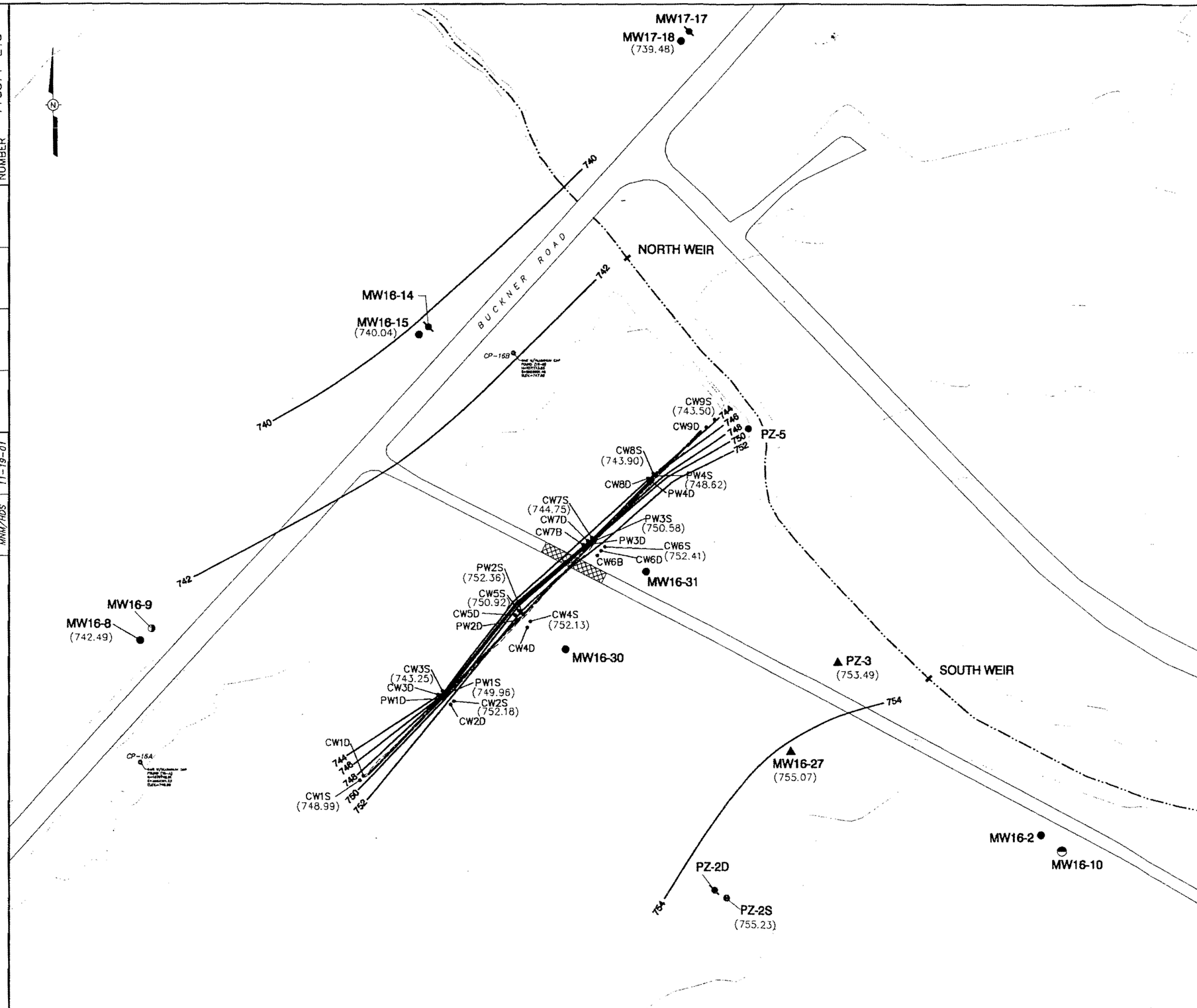
IT CORPORATION

U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

DRAWING 4

TOTAL VOC CONCENTRATIONS,
SEPTEMBER 2001

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
MNM/FHDS 11-19-01			775871-E18



LEGEND

- SHALLOW OVERBURDEN WELL
- INTERMEDIATE OVERBURDEN WELL
- DEEP OVERBURDEN WELL
- FULLY SCREENED OVERBURDEN WELL
- BEDROCK WELL
- CW2 • COMPLIANCE WELL
- PW2 • PERFORMANCE WELL
- (S/D/B) SHALLOW/DEEP/BEDROCK
- TOP OF PRW ZERO VALENT IRON/SAND TREATMENT MEDIA AT APPROXIMATELY THE 748-FOOT ELEVATION
- PRW CENTERLINE AT DEPTH
- GROUNDWATER CONTOUR
- (753.87) GROUNDWATER ELEVATION (FEET-MSL)
- GEOTEXTILE FABRIC
- LOCATION OF WEIRS ARE APPROXIMATE
- EPHEMERAL STREAM

SCALE
0 40 80 160 FEET

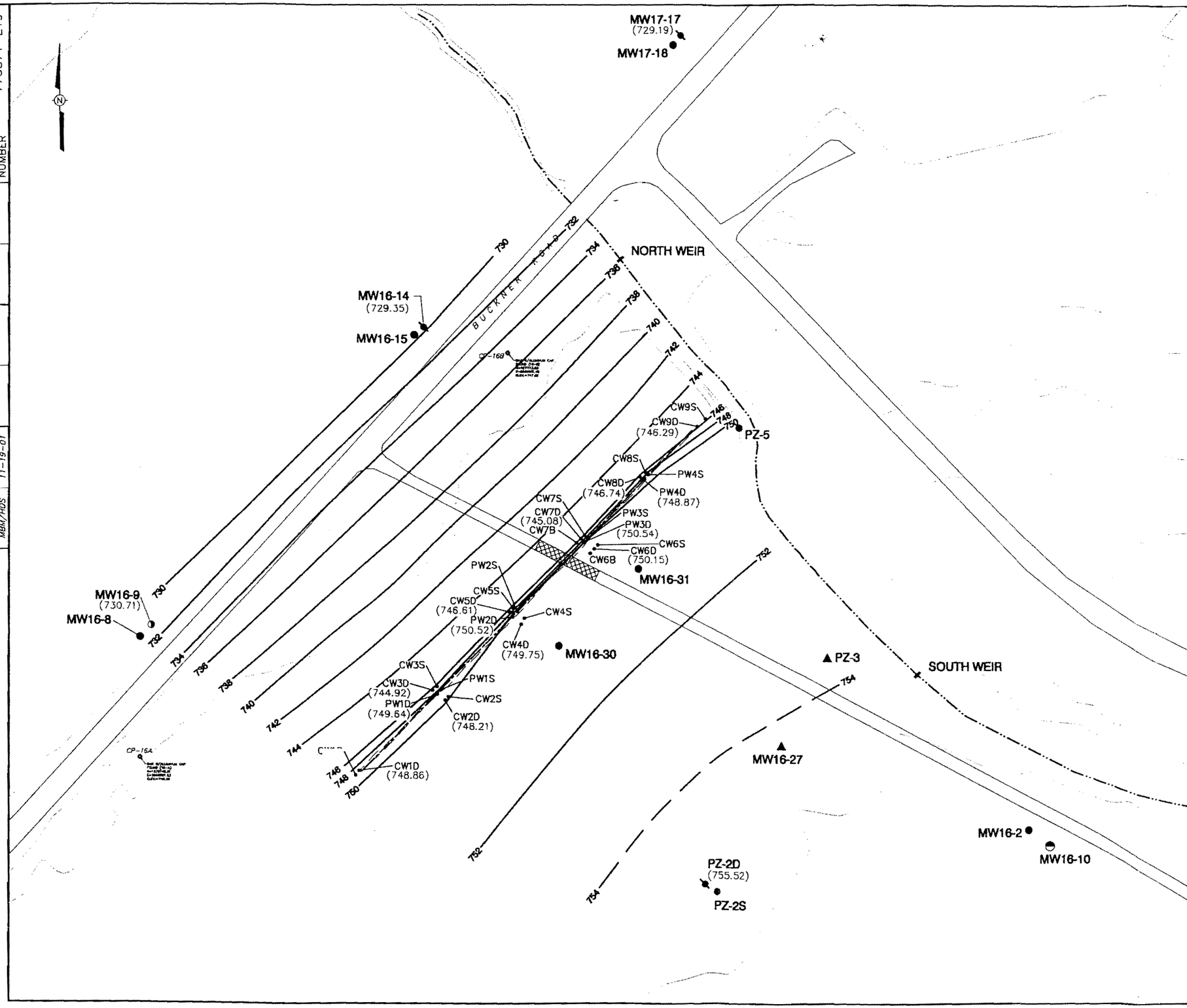
IT CORPORATION

U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

DRAWING 2

POTENTIOMETRIC SURFACE OF SHALLOW OVERBURDEN OCTOBER, 2001

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
MBW/HDS 11-19-01			775871-E19



LEGEND

- SHALLOW OVERBURDEN WELL
- INTERMEDIATE OVERBURDEN WELL
- DEEP OVERBURDEN WELL
- FULLY SCREENED OVERBURDEN WELL
- BEDROCK WELL
- CW2 • COMPLIANCE WELL
- PW2 • PERFORMANCE WELL
- (S/D/B) SHALLOW/DEEP/BEDROCK
- TOP OF PRW ZERO VALENT IRON/SAND TREATMENT MEDIA AT APPROXIMATELY THE 748-FOOT ELEVATION
- PRW CENTERLINE AT DEPTH
- GROUNDWATER CONTOUR
- (748.53) GROUNDWATER ELEVATION (FEET-MSL)
- GEOTEXTILE FABRIC
- LOCATION OF WEIRS ARE APPROXIMATE
- EPHEMERAL STREAM

NOTE:
AN ANOMALOUS GROUNDWATER ELEVATION AT CW30 IS NOT CONTOURED.

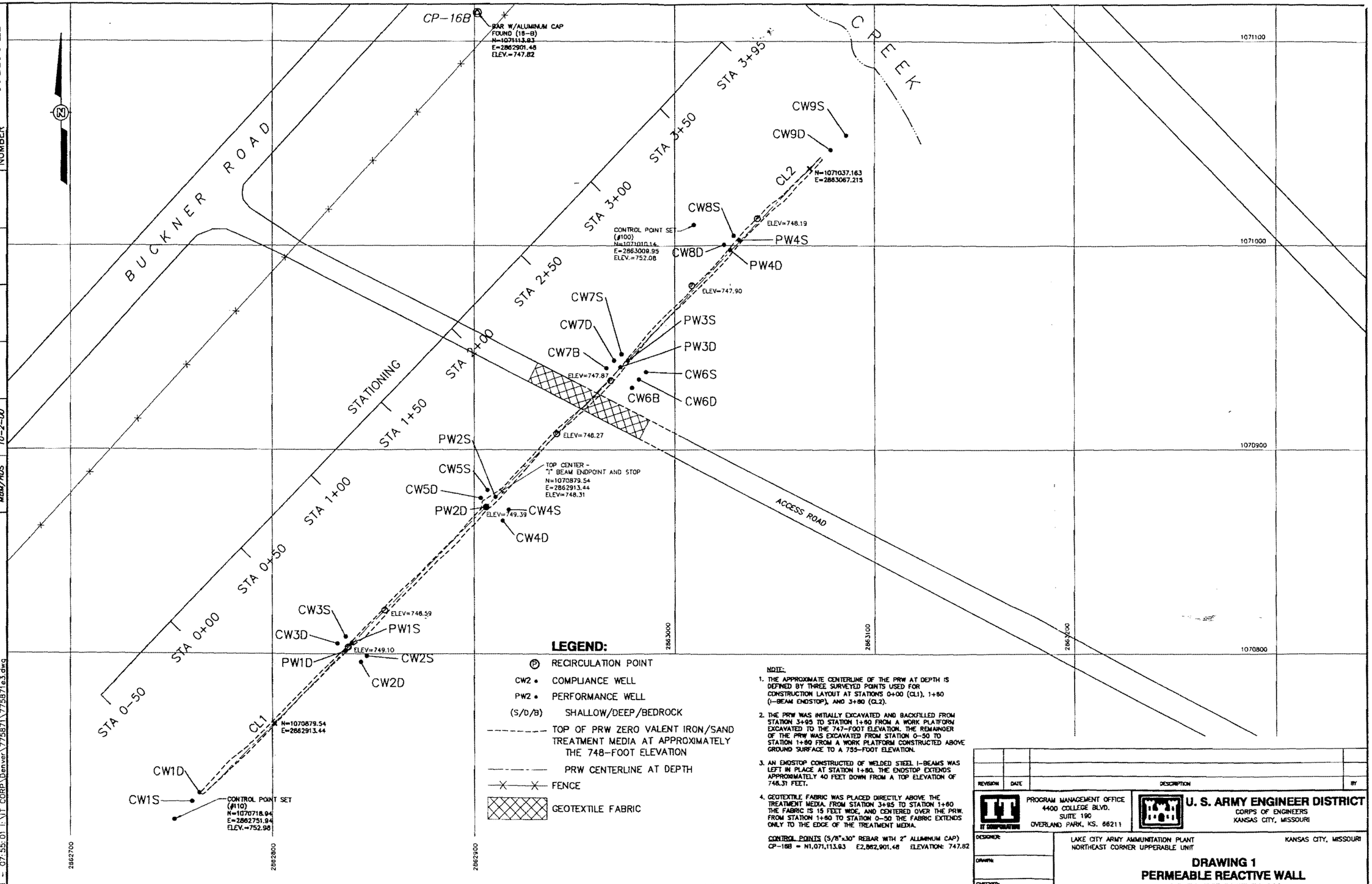
SCALE
0 40 80 160 FEET

IT CORPORATION

U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

DRAWING 3

POTENTIOMETRIC SURFACE OF DEEP OVERBURDEN OCTOBER, 2001



NOTE:

1. THE APPROXIMATE CENTERLINE OF THE PRW AT DEPTH IS DEFINED BY THREE SURVEYED POINTS USED FOR CONSTRUCTION LAYOUT AT STATIONS 0+00 (CL1), 1+60 (I-BEAM ENDSTOP), AND 3+80 (CL2).
2. THE PRW WAS INITIALLY EXCAVATED AND BACKFILLED FROM STATION 3+95 TO STATION 1+60 FROM A WORK PLATFORM EXCAVATED TO THE 747-FOOT ELEVATION. THE REMAINDER OF THE PRW WAS EXCAVATED FROM STATION 0-50 TO STATION 1+60 FROM A WORK PLATFORM CONSTRUCTED ABOVE GROUND SURFACE TO A 755-FOOT ELEVATION.
3. AN ENDSTOP CONSTRUCTED OF WELDED STEEL I-BEAMS WAS LEFT IN PLACE AT STATION 1+60. THE ENDSTOP EXTENDS APPROXIMATELY 40 FEET DOWN FROM A TOP ELEVATION OF 748.31 FEET.
4. GEOTEXTILE FABRIC WAS PLACED DIRECTLY ABOVE THE TREATMENT MEDIA. FROM STATION 3+95 TO STATION 1+60 THE FABRIC IS 15 FEET WIDE, AND CENTERED OVER THE PRW. FROM STATION 1+60 TO STATION 0-50 THE FABRIC EXTENDS ONLY TO THE EDGE OF THE TREATMENT MEDIA.

CONTROL POINTS (5/8"x30" REBAR WITH 2" ALUMINUM CAP)
CP-16B = N1,071,113.93 E2,862,901.48 ELEVATION: 747.82

REVISION	DATE	DESCRIPTION	BY

IT CORPORATION
PROGRAM MANAGEMENT OFFICE
4400 COLLEGE BLVD.
SUITE 190
OVERLAND PARK, KS. 66211

U. S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
KANSAS CITY, MISSOURI

DESIGNED:
DRAWN:
CHECKED:
SUBMITTED:
DATE SUBMITTED:

LAKE CITY ARMY AMMUNITATION PLANT
NORTHEAST CORNER UPPERABLE UNIT
KANSAS CITY, MISSOURI

DRAWING 1
PERMEABLE REACTIVE WALL
AS-BUILT SITE PLAN

SCALE:
SPEC. No.
SHEET:
FILE No.

DRAWING NUMBER 775871-E3
APPROVED BY
CHECKED BY
DRAWN BY MBM/HDS 10-2-00

Jan 23, 2001 - 07:55:01 I:\VT CORP\Denver\775871\775871e3.dwg

TABLES

Table 4
Summary of Groundwater Field Parameters and Analysis, Third Quarter 2001
Permeable Reactive Wall, Interim Remedial Action, NECOU

Well ID	Date Collected	Groundwater Depth ft TOC	Pump Flow Rate ml/min	Temperature C	pH	Specific Conductivity uS/cm	Dissolved Oxygen mg/L	ORP mV	Turbidity NTUs	Ferrous Iron mg/L	Ferric Iron mg/L	Total Iron (Lab)[1] mg/L	Alkalinity mg/L	Alkalinity (Lab)[1] mg/L
CW1D	03/14/01	5.71	56	15.60	6.60	5504	1.41	-56.10	6.80	1.60	0.00	2.21	64.00	--
	07/09/01	6.56	100	19.24	7.43	598	0.12	55.00	46.70	2.80	0.50	--	--	--
	09/25/01	5.92	50	20.94	9.15	527	0.21	61.00	46.20	3.30	0.00	--	--	--
CW1S	03/21/01	5.50	75	11.32	6.18	3184	0.31	107.80	4.60	0.00	0.00	--	164.00	--
	07/09/01	6.71	110	19.21	7.06	380	0.54	190.00	0.00	0.80	0.20	--	--	--
	09/24/01	5.97	100	18.90	8.66	357	0.63	89.00	3.81	0.09	0.00	--	--	--
CW2D	03/21/01	4.50	50	13.35	6.71	8642	0.57	120.10	85.00	6.80	5.60	--	84.00	--
	07/17/01	5.39	50	24.44	8.18	574	0.11	-6.00	176.00	2.80	2.90	--	--	--
	09/24/01	7.30	50	19.44	9.23	530	0.09	-74.00	38.30	3.30	0.00	--	--	--
CW2S	04/04/01	0.01	140	10.93	6.08	4364	0.64	164.50	1.78	1.60	0.80	--	ND	--
	07/17/01	0.00	400	16.30	7.61	505	0.45	178.00	4.67	0.00	0.16	--	--	--
	09/24/01	0.00	100	18.14	8.66	487	0.11	81.00	2.54	0.18	0.00	--	--	--
CW3D	04/03/01	7.22	41	11.59	7.00	9141	0.52	-131.40	37.00	4.60	2.50	--	ND	376
	07/12/01	20.09	108	17.20	8.24	814	0.07	-18.00	21.40	3.00	1.80	7.9	--	--
	09/21/01	18.75	50	18.00	9.49	481	0.05	-103.00	8.68	3.28	0.02	--	--	--
CW3S	04/03/01	10.31	37	10.57	6.30	8109	7.70	147.30	13.30	0.40	0.00	--	ND	--
	07/12/01	10.51	100	17.01	7.54	1600	1.15	207.00	1.94	0.00	0.15	--	--	--
	09/24/01	10.19	50	18.28	8.64	1520	0.16	16.00	0.91	3.20	0.00	--	--	--
CW4D	04/05/01	2.91	50	13.95	6.40	3959	1.82	-2.90	28.90	2.80	1.40	--	ND	--
	07/17/01	2.70	78	21.13	7.84	478	0.15	63.00	3.41	4.00	0.32	--	--	--
	09/26/01	3.85	50	17.49	9.11	454	0.14	-17.00	3.85	3.30	0.00	--	ND	203
CW4S	04/05/01	0.01	240	12.20	6.32	5288	0.28	-58.70	12.30	2.80	1.50	--	ND	--
	07/17/01	0.00	480	17.23	7.66	613	0.14	71.00	24.70	1.00	0.46	--	--	--
	09/25/01	0.10	100	20.47	8.80	575	0.19	-6.00	1.88	1.28	0.31	--	ND	268
CW5D	04/05/01	4.20	95	19.52	7.06	3165	0.32	-163.40	150.00	3.60	2.80	--	ND	--
	07/13/01	4.62	126	16.46	8.34	362	0.12	-42.00	49.90	1.80	2.85	--	--	--
	09/25/01	5.32	100	18.58	9.61	319	0.51	-91.00	36.80	2.78	0.52	--	ND	138
CW5S	04/04/01	0.50	120	11.47	10.05	1538	0.13	-329.90	2.97	0.40	0.00	--	18.40	--
	07/13/01	0.50	200	19.49	11.18	241	0.08	-212.00	22.40	0.00	1.49	--	--	--
	0925/01	1.07	100	22.10	12.44	225	0.16	-247.00	6.21	0.20	0.00	--	10.90	59.3
CW6B	04/04/01	19.43	39	15.10	7.19	6089	1.80	-130.40	14.30	0.20	0.00	--	ND	--
	07/16/01	22.60	44	22.80	8.37	713	0.18	28.00	13.10	0.80	0.00	--	--	--
	09/27/01	27.03	50	19.80	9.78	667	0.28	-34.00	26.20	0.49	0.00	--	27.00	276
CW6D	04/02/01	3.00	42	11.93	6.61	3951	0.87	-37.80	17.00	1.20	0.80	--	ND	--
	07/16/01	3.16	80	21.59	7.96	485	0.11	62.00	18.90	1.00	0.16	--	--	--
	09/27/01	4.08	50	18.67	9.45	460	0.18	-31.00	29.40	1.94	0.00	--	36.30	240
CW6S	04/02/01	0.01	280	10.91	6.18	4212	0.27	63.20	18.00	0.60	0.00	0.663	ND	215
	07/16/01	0.00	440	16.28	7.52	521	0.07	159.00	1.73	0.00	0.12	0.17	--	--
	09/27/01	0.00	100	20.38	8.95	526	0.29	26.00	0.60	0.19	0.00		27.50	244
CW7B	03/26/01	21.40	20	7.97	9.07	3857	0.75	152.70	80.00	0.00	0.00	--	12.30	--
	07/13/01	31.50	90	19.64	8.72	446	0.06	13.00	>1100	>4.0	6.08	38.4	--	--
	09/26/01	44.41	100	15.41	10.54	422	0.49	-37.00	44.80	0.30	0.18	--	50.00	181
CW7D	03/23/01	5.21	42	16.68	6.52	4352	0.26	-87.50	65.00	1.60	0.40	--	12.60	--
	07/16/01	6.05	90	17.44	8.07	414	0.12	54.00	545.00	1.20	2.80	--	--	--
	09/26/01	6.87	200	16.40	9.35	415	0.07	-27.00	45.70	1.33	0.16	--	27.00	187
CW7S	03/23/01	6.74	40	9.63	8.82	1158	0.31	-93.60	13.00	0.00	0.00	--	9.10	--
	07/16/01	7.16	66	19.32	10.42	150	0.12	3.00	10.00	0.20	0.30	--	--	--
	09/27/01	7.50	50	18.76	11.53	157	0.43	-23.00	4.18	0.23	0.00	--	26.40	47.4

[1] Results of laboratory analysis of total iron and alkalinity are shown for comparison to field analytical results. See Table 5 for additional data for iron and alkalinity.
ND = not detected. -- = not analyzed.

Table 4
Summary of Groundwater Field Parameters and Analysis, Third Quarter 2001
Permeable Reactive Wall, Interim Remedial Action, NECOU

Well ID	Date Collected	Groundwater Depth ft TOC	Pump Flow Rate ml/min	Temperature C	pH	Specific Conductivity uS/cm	Dissolved Oxygen mg/L	ORP mV	Turbidity NTUs	Ferrous Iron mg/L	Ferric Iron mg/L	Total Iron (Lab)[1] mg/L	Alkalinity mg/L	Alkalinity (Lab)[1] mg/L
CW8D	03/26/01	6.35	39	12.18	6.96	4252	0.60	-133.00	7.10	6.00	0.40	--	7.80	--
	07/11/01	8.19	96	18.27	8.04	469	0.09	29.00	4.80	0.80	0.06	--	--	--
	09/28/01	8.10	50	17.21	9.95	335	0.17	-75.00	7.58	0.71	0.00	--	--	--
CW8S	03/27/01	8.55	53	11.11	6.46	3252	0.76	45.00	130.00	0.40	0.00	--	12.50	--
	07/17/01	10.83	190	18.29	7.74	309	0.20	98.00	23.50	0.00	0.75	--	--	--
	09/28/01	10.11	50	21.50	9.45	299	0.21	-42.00	15.90	1.40	0.00	--	--	--
CW9D	03/30/01	8.28	57	12.71	6.13	3786	0.95	59.60	2.90	1.00	0.60	--	ND	--
	07/11/01	9.51	90	18.49	7.29	455	0.26	115.00	29.80	0.00	0.00	--	--	--
	09/28/01	9.15	100	19.49	8.97	437	0.49	40.00	16.30	1.19	0.00	--	--	--
CW9S	03/29/01	13.00	47	11.94	6.57	5292	6.13	188.20	19.00	0.40	0.00	--	ND	--
	07/17/01	13.45	95	19.38	7.50	506	1.24	209.00	2.06	0.00	0.13	--	--	--
	09/28/01	13.50	100	20.73	9.03	463	1.63	124.00	3.53	0.00	0.00	--	--	--
MW 16-2	04/09/01	8.10	100	15.22	6.48	4727	0.18	34.30	10.30	--	--	--	--	--
	07/18/01	8.51	80	23.24	7.92	622	1.10	33.00	5.69	--	--	--	--	--
	10/01/01	9.06	50	20.63	8.21	553	0.27	-35.00	4.14	--	--	--	--	--
PW1D	04/04/01	6.52	240	12.99	9.86	6361	0.87	-461.50	2.75	0.00	0.00	--	28.30	--
	07/10/01	6.71	125	18.12	10.65	459	0.11	-318.00	0.00	0.00	0.00	--	--	--
	09/21/01	5.72	100	19.39	12.00	354	0.10	-311.00	0.93	0.16	0.00	--	--	--
PW1S	04/04/01	3.80	480	11.01	10.46	5807	1.17	449.70	4.32	0.80	0.00	--	26.10	--
	07/10/01	6.57	400	16.08	10.96	472	0.43	-358.00	0.00	0.00	0.00	--	--	--
	09/21/01	5.51	100	19.74	12.30	407	0.17	-289.00	0.65	0.07	0.00	--	--	--
PW2D	04/05/01	3.20	240	16.39	9.24	2330	0.26	-191.80	17.60	1.40	0.40	--	22.60	--
	07/10/01	6.64	84	21.62	10.10	301	0.10	-90.00	3.01	0.00	0.19	--	--	--
	09/20/01	5.13	50	22.91	11.25	276	0.09	-71.00	3.37	0.05	0.00	--	ND	85.6
PW2S	04/05/01	2.70	240	16.25	7.05	6195	0.14	-218.70	36.40	4.50	3.80	--	ND	--
	07/10/01	3.55	120	20.85	8.15	660	0.06	-73.00	54.90	5.50	4.50	--	--	--
	09/20/01	2.64	100	22.46	9.36	700	0.06	-175.00	43.80	3.30	0.00	--	ND	333
PW3D	03/26/01	6.27	120	10.78	10.65	1048	0.30	-449.90	7.90	0.00	0.00	1.08	22.90	32.2
	07/11/01	5.56	180	16.39	11.27	151	0.25	-280.00	0.00	0.00	0.21	--	--	--
	09/20/01	4.70	100	21.18	12.51	277	0.14	-187.00	0.00	0.04	0.00	--	31.30	58.6
PW3S	03/26/01	5.15	120	10.25	10.86	1109	0.15	-488.20	22.00	2.00	0.00	--	19.90	--
	07/11/01	5.56	172	17.54	11.44	166	0.31	-295.00	0.00	0.00	0.02	--	--	--
	09/20/01	4.79	100	20.89	12.41	200	0.45	-212.00	0.00	0.11	0.00		20.00	47.4
PW4D	03/29/01	7.35	120	11.93	9.53	1013	0.15	17.80	5.50	--	--	--	15.70	--
	07/11/01	7.25	240	15.56	10.62	112	0.21	3.00	0.00	0.00	0.15	--	--	--
	09/19/01	6.51	100	19.65	11.27	124	0.14	93.00	0.00	0.05	0.00	--	NA	--
PW4S	03/29/01	5.50	120	9.75	9.94	943	0.15	298.00	5.40	0.60	0.00	--	8.40	--
	07/11/01	8.79	190	16.36	10.97	108	0.26	-160.00	0.00	0.00	0.00	--	--	--
	09/19/01	6.06	100	18.34	11.72	121	0.69	-76.00	0.00	0.00	0.03	--	--	--
PZ-2D	10/02/01	7.99	150	14.34	8.56	478	1.18	4.00	48.10	--	--	--	--	289
PZ-2S	10/.01/01	9.09	50	18.16	8.18	305	0.43	79.00	4.10	--	--	--	--	151
PZ-3	04/09/01	7.13	50	18.60	6.65	5577	3.74	202.30	48.70	--	--	--	--	--
	07/18/01	8.43	50	22.45	8.16	653	3.90	225.00	80.50	--	--	--	--	--
	10/01/01	12.65	50	20.43	8.33	519	1.93	172.00	12.40	--	--	--	--	293

[1] Results of laboratory analysis of total iron and alkalinity are shown for comparison to field analytical results. See Table 5 for additional data for iron and alkalinity.
ND = not detected. -- = not analyzed.

Table 5
Summary of Groundwater Inorganic Chemistry, Third Quarter 2001
Permeable Reactive Wall, Interim Remedial Action, NECOU

		DISSOLVED CATIONS								ANIONS					ALKALINITY			
Well ID	DATE COLLECTED	ALUMINUM	BARIUM	CALCIUM	IRON	MAGNESIUM	MANGANESE	POTASSIUM	SODIUM	BROMIDE	CHLORIDE	FLUORIDE	NITRATE	SULFATE	ALKALINITY	ALKALINITY, BICARBONATE	ALKALINITY, CARBONATE	ALKALINITY, HYDROXIDE
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CW-3D	4/3/01	--	--	--	--	--	--	--	--	--	--	--	--	--	376	--	--	--
CW-4D	4/5/01	ND	0.272	77.8	ND	9.26	1.95	ND	13	ND	9.49	0.328	ND	21.9	--	--	--	--
	9/26/01	ND	0.284	71.3	4.2	9.21	5.23	ND	9.6	ND	9.05	ND	ND	6.11	203	203	ND	ND
CW-4S	4/5/01	0.141	0.212	109	1.55	9.13	0.991	ND	20.4	ND	7.28	0.148	ND	14.1	--	--	--	--
	9/25/01	ND	0.223	95.1	0.725	8.6	0.644	ND	21.2	ND	13	ND	ND	7	268	268	ND	ND
CW-5D	4/5/01	ND	0.583	43.4	ND	6.17	0.612	ND	22.9	ND	12.7	1.58	ND	1.19	--	--	--	--
	9/26/01	ND	0.169	39.6	0.763	5.67	0.514	ND	21.9	ND	5.75	ND	ND	10.2	138	138	ND	ND
CW-5S	4/4/01	ND	0.0201	12.3	ND	3.36	0.0151	ND	20.8	ND	9.42	1.09	ND	1.68	--	--	--	--
	9/25/01	ND	0.0286	10.2	ND	0.159	ND	2.71	34.2	ND	5	ND	ND	13	53.9	27.9	26	ND
CW-6B	9/27/01	ND	0.32	75.8	ND	12.8	0.139	4.85	55	ND	59.8	ND	ND	6	276	276	ND	ND
CW-6D	9/27/01	2.35	0.242	76.9	3.52	11.9	3.09	ND	12.5	ND	5.15	ND	ND	10.5	240	240	ND	ND
CW-6S	4/2/01	--	--	--	--	--	--	--	--	--	--	--	--	--	215	--	--	--
	9/27/01	ND	0.242	94.1	ND	8.41	0.18	ND	13.2	ND	18.5	ND	ND	15.6	244	244	ND	ND
CW-7B	9/26/01	ND	0.125	52.7	ND	6.48	0.167	2.53	37.5	8.2	ND	ND	ND	22.5	181	176	5.58	ND
CW-7D	9/26/01	ND	0.348	58.1	0.459	7.61	5.72	ND	19.4	ND	17.8	ND	ND	14.2	187	187	ND	ND
CW-7S	9/27/01	0.163	0.0154	10.4	ND	0.402	0.066	ND	22.6	ND	25.3	ND	ND	ND	47.4	47.4	ND	ND
PW-2D	4/5/01	ND	0.0378	24.7	ND	1.58	0.0963	ND	34.7	1.39	23.7	2.26	ND	ND	--	--	--	--
	9/20/01	ND	0.0339	28.5	ND	1.31	0.0122	ND	50.2	ND	11	ND	ND	9.1	85.6	85.6	ND	ND
PW-2S	4/5/01	ND	0.411	106	4.61	9.1	2.12	ND	21.4	ND	7.19	0.162	ND	7.46	--	--	--	--
	9/20/01	ND	0.173	112	3.61	10.4	2.24	ND	22.3	ND	19	ND	ND	1.05	333	333	ND	ND
PW-3D	3/26/01	--	--	--	--	--	--	--	--	--	--	--	--	--	32.2	--	--	--
	9/20/01	0.711	0.019	9.8	ND	0.114	ND	ND	30.2	ND	22.1	ND	ND	1.66	58.6	ND	20.5	38.1
PW-3S	9/20/01	ND	0.0218	8.04	ND	0.262	ND	ND	43	ND	20.5	ND	ND	ND	47.4	15.9	33.5	ND
PZ-2D	10/2/01	ND	0.367	79.7	ND	10.9	1.78	ND	22.9	ND	ND	ND	ND	ND	151	151	ND	ND
PZ-2S	10/1/01	ND	0.166	60.3	ND	5.59	0.0804	ND	6.56	ND	ND	ND	ND	ND	289	289	ND	ND
PZ-3	10/1/01	ND	0.199	94.4	ND	16.4	0.0114	ND	18.5	ND	ND	ND	ND	ND	293	293	ND	ND

Note: Dissolved cations and anions are analyzed semiannually. ND = not detected. -- = not analyzed.

Table 6
Summary of Groundwater and Surface Water Organic Chemistry
Permeable Reactive Wall, Interim Remedial Action, NECOU

Location	Analyte	Total Volatiles	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dicholorethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,2-Dichloroethane	2-Butanone	2-Hexanone	4-Methyl-2-pentanone	Acetone	Benzene	Bromochloromethane	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Dichlordifluoromethane	m-Xylene and p-Xylene	Napthalene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Dissolved Organic Carbo
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
	Remediation Goals	--	200	5	--	7	--	5	--	--	--	--	5	--	--	--	100	--	70	--	--	--	5	1000	100	5	2	--
	DATE COLLECTED																											
CW1D	03/14/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.8
CW1D	07/09/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8
CW1D	9/25/01	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.24	19.3
CW1S	03/21/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7
CW1S	07/09/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7
CW1S	9/24/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.5
CW2D	03/21/01	197.16	ND	ND	ND	ND	ND	ND	118	ND	1.18	74.6	0.87	ND	ND	0.68	ND	ND	0.6	ND	ND	ND	ND	ND	ND	1.23	ND	90
CW2D	07/17/01	2.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.35	ND	ND	ND	0.95	ND	ND	0.33	ND	0.35	ND	0.98	ND	1.3
CW2D	9/24/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16.9
CW2S	04/04/01	43.96	1.55	ND	0.68	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.96	ND	ND	ND	**7.17**	ND	ND	**28.3**	ND	1.3
CW2S	07/17/01	31.25	1.09	ND	0.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.45	ND	ND	ND	**6.05**	ND	ND	**18.2**	ND	1.2
CW2S	9/24/01	24.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.47	ND	ND	ND	4.23	ND	ND	**14.5**	ND	16.8
CW3D	04/03/01	139.84	ND	ND	ND	ND	ND	ND	88.9	2.04	3.87	40.8	2.92	ND	0.39	ND	ND	0.92	ND	ND	ND	ND	ND	ND	ND	ND	ND	163
CW3D	07/12/01	17.16	ND	ND	ND	ND	ND	ND	10.9	ND	3.57	ND	1.25	ND	0.63	ND	ND	ND	ND	ND	ND	0.37	ND	0.44	ND	ND	ND	21.7
CW3D	9/21/01	17.31	ND	ND	ND	ND	ND	ND	10.9	ND	3.57	ND	1.4	ND	0.63	ND	ND	ND	ND	ND	ND	0.37	ND	0.44	ND	ND	ND	20.1
CW3S	04/03/01	35.3	0.93	ND	0.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.46	0.62	2.56	ND	ND	ND	2.55	ND	ND	**27.6**	ND	1.8
CW3S	07/12/01	25.89	0.64	ND	0.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.28	ND	ND	ND	2.65	ND	ND	**21**	ND	1.6
CW3S	9/24/01	11.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.62	ND	ND	**9.53**	ND	20
CW4D	04/05/01	702.52	ND	0.35	9.06	4.88	ND	0.32	ND	ND	ND	ND	0.3	ND	ND	ND	ND	ND	**148**	1.05	ND	ND	1.97	ND	2.59	**534**	ND	1.4
CW4D (BD-3)	04/05/01	801.53	ND	0.33	8.85	4.04	ND	0.33	ND	ND	ND	ND	0.31	ND	ND	ND	ND	0.55	**166**	1.01	ND	ND	1.92	ND	7.19	**611**	ND	--
CW4D	07/17/01	936.58	ND	0.49	13.9	5.68	ND	ND	ND	ND	ND	ND	0.37	ND	0.45	ND	ND	ND	**202**	1.81	ND	ND	4.33	ND	13.2	**694**	0.35	0.9
CW4D	9/26/01	438.38	ND	ND	10.9	6.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**95.6**	ND	ND	ND	**5.47**	ND	4.93	**315**	ND	43.3
CW4S	04/05/01	29.21	ND	ND	0.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.89	24.2	ND	ND	ND	ND	ND	0.78	2.38	0.44	1.9
CW4S	07/17/01	16.39	ND	ND	0.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.26	ND	ND	ND	14.8	ND	ND	ND	ND	ND	0.95	ND	ND	1.2
CW4S (BD071701)	07/17/01	15.76	ND	ND	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.5	ND	ND	ND	ND	ND	0.54	0.35	ND	--
CW4S	9/25/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18.4
CW5D	04/05/01	68.42	ND	ND	0.79	0.52	ND	ND	4.22	ND	ND	ND	0.75	ND	3.2	0.34	ND	0.4	54.6	ND	ND	ND	ND	ND	0.61	0.32	**2.67**	7
CW5D	07/13/01	11.9	ND	ND	0.46	ND	ND	ND	ND	ND	ND	ND	0.54	ND	1.72	ND	ND	ND	1.12	ND	ND	ND	ND	ND	ND	ND	**8.06**	1.9
CW5D	9/25/01	1.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.3
CW5S	04/04/01	1.99	ND	ND	ND	ND	ND	ND	1.41	ND	ND	ND	0.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	37
CW5S	07/13/01	1.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.35	ND	ND	ND	28
CW5S (BD071301)	07/13/01	1.62	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.39	ND	ND	ND	--
CW5S	9/25/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.1
CW6B	04/04/01	4.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.84	ND	0.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3
CW6B	07/16/01	1.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.42	ND	0.25	ND	ND	ND	ND	ND	ND	0.29	ND	ND	ND	0.9
CW6B	9/27/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16.5
CW6D	04/02/01	10.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.13	8.33	ND	ND	ND	ND	ND	ND	1.04	ND	1.2
CW6D	07/16/01	37.68	ND	ND	1.07	0.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	28.8	ND	ND	ND	ND	ND	0.37	**7.01**	ND	0.9
CW6D	9/27/01	62.4	ND	ND	ND	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	37.4	ND	ND	ND	ND	ND	ND	ND	ND	16.4
CW6S	04/02/01	131.11	0.6	ND	2.04	0.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.43	0.78	61.6	ND	ND	ND	1.22	ND	2.98	**60.8**	0.34	1.2
CW6S (BD-2)	04/02/01	133.62	0.62	ND	2.1	0.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.41	0.32	64.3	ND	ND	ND	1.28	ND	1.49	**62.4**	0.35	--
CW6S	07/16/01	97.51	0.43	ND	0.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.37	ND	46.6	ND	ND	ND	0.43	ND	0.97	**47.2**	0.57	1
CW6S	9/27/01	59.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35.5	ND	ND	ND	ND	ND	ND	**23.7**	ND	8.02
CW6S (CW106S)	9/27/01	57.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33.8	ND	ND	ND	ND	ND	ND	**24**	ND	--
CW7B	03/26/01	4.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.26	0.61	ND	1.21	0.38	0.91	ND	ND	ND	ND	ND	ND	1.04	ND	2.1
CW7B	07/13/01	1.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.64	ND	ND	ND	0.68	ND	ND	ND	ND	ND	ND	0.65	ND	4.6
CW7B	9/26/01	3.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.41	ND	ND	ND	ND	ND	ND	2.39	ND	14.9
CW7D	03/23/01	401.93	ND	ND	9.94	4.08	ND	ND	1.26	ND	ND	ND	0.97	ND	ND	0.72	ND	0.64	**220**	ND	ND	ND	4.81	ND	1.71	**128**	**29.8**	2.4
CW7D	07/16/01	328.24	ND	ND	8.11	3.28	ND	ND	ND	ND	ND	ND	0.58	ND	ND	0.79	ND	ND	**153**	ND	ND	ND	3.97	ND	1.91	**119**	**37.6**	2.3
CW7D	9/26/01	494.52	ND	ND	7.14	3.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.79	ND	ND	**245**	ND	ND	ND	3.79	ND	1.34	**180**	**53.2**	16.6
CW7S	03/23/01	1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.82	ND	ND	ND	ND	ND	1.08	ND	ND	ND	ND	ND	ND	ND	ND	17.1
CW7S	07/16/01	2.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.62	ND	ND	ND	ND	ND	1.8	ND	ND	ND	ND	ND	ND	0.52	ND	4.1
CW7S	9/27/01	2.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.06	ND	ND	ND	ND	ND	1.47	ND	ND	ND	ND	ND	ND	ND	ND	15.8
CW7S (CW107S)	9/27/01	2.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.08	ND	ND	ND	ND	ND	1.65	ND	ND	ND	ND	ND	ND	ND	ND	--
CW8D	03/26/01	17.05	ND	ND	2.12	0.45	ND	ND	ND	ND	ND	ND	ND	ND	0.83	0.34	ND	ND	ND	ND	ND	ND	ND	ND	0.41	**12.9**	ND	1.5
CW8D	07/11/01	46.39	ND	ND	1.53	0.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.38	ND	ND	34.3	ND	ND	ND	ND	0.38	0.27	**9.15**	ND	1.6
CW8D	9/27/01	28.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21.6	ND	ND	ND	ND	ND	ND	**6.71**	ND	11.2
CW8S	03/27/01	95.26	ND	ND	5.58	1.08	ND	ND	ND	ND	ND	ND	0.29	ND	ND	0.37	ND	ND	**72.3**	ND	ND	ND	0.32	ND	0.62	**14.7**	ND	1.4

Only analytes detected in one or more samples are shown. ND = not detected. -- = not analyzed. Bold face result indicates remediation goal is exceeded. Field duplicates are indicated by sample ID shown in parentheses with well ID.

Table 6
Summary of Groundwater and Surface Water Organic Chemistry
Permeable Reactive Wall, Interim Remedial Action, NECOU

Location	Analyte	Total Volatiles	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dicholorethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,2-Dichloroethane	2-Butanone	2-Hexanone	4-Methyl-2-pentanone	Acetone	Benzene	Bromochloromethane	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Dichlorodifluoromethane	m-Xylene and p-Xylene	Napthalene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Dissolved Organic Carbo
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
	Remediation Goals	--	200	5	--	7	--	5	--	--	--	--	5	--	--	--	100	--	70	--	--	--	5	1000	100	5	2	--
CW8S	07/17/01	54.98	ND	ND	4.24	0.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	ND	ND	39.4	ND	ND	ND	ND	ND	0.48	**9.88**	ND	1.3
CW8S	9/28/01	39.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	ND	ND	**7.01**	ND	11.5
CW9D	03/30/01	141.41	0.49	ND	3.43	0.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.71	**105**	ND	ND	ND	ND	ND	2.93	**28.6**	ND	1.2
CW9D	07/11/01	120.06	0.48	ND	2.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.71	**97.9**	ND	ND	ND	ND	ND	5.1	**13.6**	ND	1.4
CW9D	9/28/01	71.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.71	65.2	ND	ND	ND	ND	ND	2.38	3.09	ND	14.9
CW9S	03/29/01	25.9	ND	ND	1.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.82	16.5	ND	ND	ND	ND	ND	0.27	**7.07**	ND	2.1
CW9S	07/17/01	86.43	0.43	ND	2.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	43.9	ND	ND	0.33	0.54	ND	0.71	**38.1**	ND	1.6
CW9S	9/28/01	65.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32.9	ND	ND	ND	1.1	ND	ND	**31.1**	ND	15.2
MW16-2	04/09/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.8
MW16-2	07/18/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.7
MW16-2	10/1/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21.4
PW1D	04/04/01	10.83	ND	ND	ND	ND	ND	ND	9.37	ND	ND	ND	1.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190
PW1D	07/10/01	1.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	95
PW1D	9/21/01	1.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	65.6
PW1S	04/04/01	73.68	ND	ND	ND	ND	ND	ND	29.7	ND	ND	42.7	1.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	180
PW1S	07/10/01	5.23	ND	ND	ND	ND	ND	ND	3.99	ND	ND	ND	1.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	88
PW1S	9/21/01	1.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	69.9
PW2D	04/05/01	10.77	ND	ND	ND	ND	ND	ND	4.36	ND	ND	5.44	0.63	ND	ND	ND	ND	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	48
PW2D	07/10/01	9.38	ND	ND	ND	ND	ND	ND	3.21	ND	2.19	1.95	0.71	ND	ND	ND	ND	ND	ND	ND	0.28	0.55	ND	0.49	ND	ND	ND	48
PW2D	9/20/01	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	39.4
PW2S	04/05/01	13.18	ND	ND	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.72	ND	ND	ND	ND	ND	ND	ND	**3.98**	1.9
PW2S	07/10/01	3.58	ND	ND	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.23	ND	ND	ND	ND	ND	ND	ND	**2.01**	3.5
PW2S	9/20/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.1
PW3D	03/26/01	1.88	ND	ND	0.52	ND	ND	ND	ND	ND	ND	ND	0.88	ND	ND	ND	ND	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.1
PW3D	07/11/01	0.9	ND	ND	0.32	ND	ND	ND	ND	ND	ND	ND	0.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9
PW3D (BD071101)	07/11/01	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--
PW3D	9/20/01	2.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	ND	ND	ND	ND	ND	ND	ND	1.7	4.1
PW3S	03/26/01	1.19	ND	ND	0.45	ND	ND	ND	ND	ND	ND	ND	0.48	ND	ND	ND	ND	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.8
PW3S	07/11/01	1.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.51	ND	ND	ND	ND	0.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5
PW3S	9/20/01	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.82
PW3S (PW103S)	9/20/01	0.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.47
PW4D	03/29/01	1.67	ND	ND	1.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.7
PW4D	07/11/01	0.7	ND	ND	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
PW4D	9/19/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.32
PW4S	03/29/01	2.78	ND	ND	1.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54	0.95	ND	ND	ND	ND	ND	ND	ND	ND	3.3
PW4S (BD-1A)	03/29/01	2.53	ND	ND	1.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.42	0.79	ND	ND	ND	ND	ND	ND	ND	ND	--
PW4S	07/11/01	0.61	ND	ND	0.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
PW4S	9/19/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.26
PZ-3	04/09/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1
PZ-3	07/18/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.9
PZ-3	10/1/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17
SW16-01	10/1/01	40.87	ND	ND	4.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.18	ND	ND	30.1	ND	ND	ND	ND	ND	ND	1.06	**3.7**	--
SW16-02	10/1/01	23.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15.5	ND	ND	ND	ND	ND	ND	**8.37**	ND	--

Note: Only analytes detected in one or more samples are shown. ND = not detected. -- = not analyzed. Bold face result indicates remediation goal is exceeded. Field duplicates are indicated by sample ID shown in parentheses with well ID.

Table 1
Measured Depths to Groundwater
Permeable Reactive Wall, Interim Remedial Action, NECOU

Well ID	Northing (ft)	Easting (ft)	Initial TOC Elevation (ft)	Final TOC Elevation (ft)	Total Measured Depth from TOC (ft)	Depth to Water from TOC (ft)										
		Dates Measured	*1/16/01*	*5/9/01*	*2/7-13/01*	*2/7-13/01*	*3/1/01*	*3/13/01*	*4/2-9/01*	*5/1-11/01*	*6/11-13/01*	*7/2-10/01*	*8/14-23/01*	*9/17/01*	*10/16/01*	*11/15/01*
CW1D	1070731.8	2862764.2	754.01	753.99	46.10	5.12	4.85	5.48	5.48	5.60	#N/A	5.93	6.99	6.10	5.13	6.38
CW1S	1070727.7	2862760.8	754.10	754.05	20.12	5.32	5.26	5.85	5.3	5.87	#N/A	6.19	6.93	6.06	5.06	6.22
CW2D	1070795.9	2862843.9	752.53	752.14	58.60	19.22	13.86	5.6	3.1	3.24	#N/A	2.49	5.55	5.06	3.93	4.01
CW2S	1070798.9	2862846.9	752.90	752.18	18.40	0.01	0.01	0.01	0.01	0.00	#N/A	0.00	0.03	0.00	0.00	0.00
CW3D	1070804.9	2862832.3	752.35	752.02	59.58	10.80	5.71	6.46	8.15	16.90	#N/A	13.80	11.88	13.87	7.10	8.28
CW3S	1070808.2	2862836.4	752.32	751.96	18.06	9.40	6.92	10.49	9.5	6.79	#N/A	8.19	10.54	9.78	8.71	8.94
CW4D	1070865.0	2862914.0	752.27	752.15	44.36	2.16	1.91	3.34	2.32	1.36	#N/A	1.20	2.82	3.11	2.40	2.39
CW4S	1070870.4	2862917.0	752.24	752.13	18.28	0.01	0.01	0.01	0.01	0.00	#N/A	0.00	1.83	1.06	0.00	1.00
CW5D	1070876.1	2862903.1	752.15	751.80	44.50	3.40	6.11	8.1	5.59	4.50	#N/A	4.46	7.37	5.40	5.19	5.29
CW5S	1070880.0	2862906.5	752.10	751.79	18.24	0.01	0.01	0.01	0.5	0.31	#N/A	0.10	2.10	2.10	0.87	1.66
CW6B	1070930.3	2862978.5	752.89	752.51	61.90	36.88	26.56	23.19	17.81	18.50	#N/A	17.56	21.50	20.23	18.80	19.29
CW6D	1070934.4	2862982.0	752.77	752.39	38.34	17.22	10.8	3.05	2.8	1.86	#N/A	2.69	3.94	3.56	2.24	3.15
CW6S	1070938.1	2862985.5	752.84	752.41	18.40	0.01	0.01	0.01	0.01	0.00	#N/A	0.00	0.00	0.33	0.00	0.19
CW7B	1070940.0	2862965.7	752.41	752.31	61.38	37.62	19.03	19.2	18.38	18.82	#N/A	18.15	20.35	19.75	18.91	19.38
CW7D	1070943.7	2862969.6	752.44	752.28	40.10	4.50	4.7	5.46	5.5	5.71	#N/A	6.76	8.73	7.11	7.20	6.69
CW7S	1070946.8	2862973.3	752.53	752.07	15.20	4.10	8.96	7.01	6.3	5.26	#N/A	7.22	8.95	6.79	7.32	6.52
CW8D	1071000.3	2863025.1	752.18	752.14	36.62	5.84	4.52	5.94	5.92	6.03	#N/A	5.80	7.06	6.04	5.40	5.83
CW8S	1071004.7	2863029.9	752.05	752.05	17.72	7.14	8.49	8.54	8.4	8.24	#N/A	8.52	8.96	8.66	8.15	8.64
CW9D	1071046.8	2863078.1	754.75	754.70	22.08	11.42	10.26	9.68	9.03	8.33	#N/A	8.50	9.11	8.71	8.41	8.95
CW9S	1071053.8	2863085.9	755.73	755.75	20.76	14.22	13.03	12.44	11.78	11.67	#N/A	10.66	11.82	11.81	12.25	11.65
MW16-10	1070667.5	2863401.0	765.45	765.45	65.50	#N/A	9.64	9.47	9.3	9.59	9.32	10.09	11.34	11.16	10.58	10.56
MW16-14	1071139.4	2862824.3	748.69	748.69	73.70	#N/A	19.68	19.84	18.82	19.92	17.21	18.48	21.37	20.90	19.34	20.49
MW16-15	1071130.4	2862815.3	748.74	748.74	21.50	#N/A	7.71	8.22	7.62	9.46	8.16	9.54	10.90	9.98	8.70	10.20
MW16-2	1070678.4	2863387.3	764.38	764.38	35.40	#N/A	7.52	7.93	7.69	8.05	7.50	8.77	10.06	9.06	7.69	8.87
MW16-27	1070754.5	2863118.0	760.16	760.16	28.40	#N/A	4.36	5.14	4.8	5.18	#N/A	6.11	7.76	16.70	5.09	6.65
MW16-30	1070845.4	2862949.0	754.96	754.96	#N/A	#N/A	#N/A	#N/A	#N/A	7.03	#N/A	#N/A	#N/A	4.56	3.60	3.85
MW16-31	1070915.8	2863023.2	756.97	756.97	#N/A	#N/A	11.58	12.47	#N/A	17.63	#N/A	#N/A	#N/A	13.68	12.42	13.42
MW16-8	1070853.0	2862560.8	749.94	749.94	24.90	#N/A	5.76	6.17	6.26	8.31	#N/A	8.73	11.48	10.44	7.45	10.73
MW16-9	1070863.1	2862571.8	750.01	750.01	51.00	#N/A	19.01	19.51	18.61	19.71	#N/A	18.49	21.19	20.64	19.30	20.19
MW17-17	1071404.3	2863062.3	746.71	746.71	62.00	#N/A	#N/A	17.91	16.95	5.47	15.31	16.56	19.45	19.02	17.52	18.61
MW17-18	1071395.3	2863055.3	746.70	746.70	19.50	#N/A	#N/A	6.84	2.66	7.68	6.43	7.89	9.72	8.69	7.22	9.14
PW1D	1070801.4	2862836.5	756.11	755.47	60.52	9.20	5.95	6.71	6.19	6.12	#N/A	6.45	7.80	6.94	5.83	6.94
PW1S	1070805.2	2862839.5	753.92	755.67	19.76	3.68	3.36	4.22	3.19	6.04	#N/A	6.53	7.73	6.88	5.71	6.89
PW2D	1070871.7	2862905.9	753.84	755.28	44.28	2.46	2.41	3.13	2.72	4.88	#N/A	5.31	6.44	5.81	4.76	5.92
PW2S	1070876.6	2862910.4	755.55	755.13	21.68	2.66	3.04	3.27	2.57	3.25	#N/A	3.44	4.24	4.00	2.77	4.10
PW3D	1070940.5	2862972.7	757.01	755.39	45.60	6.64	5.63	6.27	6.31	4.83	#N/A	5.46	6.47	5.82	4.85	5.92
PW3S	1070943.7	2862976.5	755.90	755.53	20.48	4.54	4.56	5.19	5.16	4.95	#N/A	5.53	6.54	5.86	4.95	6.01
PW4D	1070997.8	2863028.1	756.16	755.57	39.68	6.71	6.75	7.25	7.3	6.89	#N/A	7.14	7.76	7.31	6.70	7.29
PW4S	1071002.5	2863032.7	754.16	754.92	20.18	4.92	4.95	5.39	5.44	6.49	#N/A	6.71	7.30	6.88	6.30	6.92
PZ-2D	1070625.0	2863088.7	760.55	760.55	48.90	#N/A	4.37	4.94	4.7	5.11	4.60	6.15	7.90	6.99	5.03	5.71
PZ-2S	1070621.3	2863096.7	760.80	760.80	24.40	#N/A	4.64	5.48	5.08	5.48	4.99	6.46	8.20	6.29	5.57	7.02
PZ-3	1070835.0	2863199.5	759.62	759.62	22.40	#N/A	5.2	5.7	5.75	5.71	5.47	6.41	7.70	6.70	6.13	6.82
PZ-5	1071045.2	2863118.0	747.55	747.55	9.00	#N/A	4.83	4.93	4.88	4.86	4.74	4.74	4.88	4.84	4.71	4.74

Note: TOC = Top of Casing
#N/A - Not Measured

Table 2
Groundwater Elevations
Permeable Reactive Wall, Interim Remedial Action, NECOU

Well ID	Northing (ft)	Easting (ft)	Groundwater Elevation (ft)										
		Dates Measured	*2/7-13/01*	*3/1/01*	*3/13/01*	*4/2-9/01*	*5/1-11/01*	*6/11-13/01*	*7/2-10/01*	*8/14-23/01*	*9/17/01*	*10/16/01*	*11/15/01*
CW1D	1070731.8	2862764.2	748.89	749.16	748.53	748.53	748.39	#N/A	748.06	747.00	747.89	748.86	747.61
CW1S	1070727.7	2862760.8	748.78	748.84	748.25	748.80	748.18	#N/A	747.86	747.12	747.99	748.99	747.83
CW2D	1070795.9	2862843.9	733.31	738.67	746.93	749.43	748.90	#N/A	749.65	746.59	747.08	748.21	748.13
CW2S	1070798.9	2862846.9	752.89	752.89	752.89	752.89	752.18	#N/A	752.18	752.15	752.18	752.18	752.18
CW3D	1070804.9	2862832.3	741.55	746.64	745.89	744.20	735.12	#N/A	738.22	740.14	738.15	744.92	743.74
CW3S	1070808.2	2862836.4	742.92	745.40	741.83	742.82	745.17	#N/A	743.77	741.42	742.18	743.25	743.02
CW4D	1070865.0	2862914.0	750.11	750.36	748.93	749.95	750.79	#N/A	750.95	749.33	749.04	749.75	749.76
CW4S	1070870.4	2862917.0	752.23	752.23	752.23	752.23	752.13	#N/A	752.13	750.30	751.07	752.13	751.13
CW5D	1070876.1	2862903.1	748.75	746.04	744.05	746.56	747.30	#N/A	747.34	744.43	746.40	746.61	746.51
CW5S	1070880.0	2862906.5	752.09	752.09	752.09	751.60	751.48	#N/A	751.69	749.69	749.69	750.92	750.13
CW6B	1070930.3	2862978.5	716.01	726.33	729.70	735.08	734.01	#N/A	734.95	731.01	732.28	733.71	733.22
CW6D	1070934.4	2862982.0	735.55	741.97	749.72	749.97	750.53	#N/A	749.70	748.45	748.83	750.15	749.24
CW6S	1070938.1	2862985.5	752.83	752.83	752.83	752.83	752.41	#N/A	752.41	752.41	752.08	752.41	752.22
CW7B	1070940.0	2862965.7	714.79	733.38	733.21	734.03	733.49	#N/A	734.16	731.96	732.56	733.40	732.93
CW7D	1070943.7	2862969.6	747.94	747.74	746.98	746.94	746.57	#N/A	745.52	743.55	745.17	745.08	745.59
CW7S	1070946.8	2862973.3	748.43	743.57	745.52	746.23	746.81	#N/A	744.85	743.12	745.28	744.75	745.55
CW8D	1071000.3	2863025.1	746.34	747.66	746.24	746.26	746.11	#N/A	746.34	745.08	746.10	746.74	746.31
CW8S	1071004.7	2863029.9	744.91	743.56	743.51	743.65	743.81	#N/A	743.53	743.09	743.39	743.90	743.41
CW9D	1071046.8	2863078.1	743.33	744.49	745.07	745.72	746.37	#N/A	746.20	745.59	745.99	746.29	745.75
CW9S	1071053.8	2863085.9	741.51	742.70	743.29	743.95	744.08	#N/A	745.09	743.93	743.94	743.50	744.10
MW16-10	1070667.5	2863401.0	#N/A	755.81	755.98	756.15	755.86	756.13	755.36	754.11	754.29	754.87	754.89
MW16-14	1071139.4	2862824.3	#N/A	729.01	728.85	729.87	728.77	731.48	730.21	727.32	727.79	729.35	728.20
MW16-15	1071130.4	2862815.3	#N/A	741.03	740.52	741.12	739.28	740.56	739.20	737.84	738.76	740.04	738.54
MW16-2	1070678.4	2863387.3	#N/A	756.86	756.45	756.69	756.33	756.88	755.61	754.32	755.32	756.69	755.51
MW16-27	1070754.5	2863118.0	#N/A	755.80	755.02	755.36	754.98	#N/A	754.05	752.40	743.46	755.07	753.51
MW16-30	1070845.4	2862949.0	#N/A	#N/A	#N/A	#N/A	747.93	#N/A	#N/A	#N/A	750.40	751.36	751.11
MW16-31	1070915.8	2863023.2	#N/A	745.39	744.50	#N/A	739.34	#N/A	#N/A	#N/A	743.29	744.55	743.55
MW16-8	1070853.0	2862560.8	#N/A	744.18	743.77	743.68	741.63	#N/A	741.21	738.46	739.50	742.49	739.21
MW16-9	1070863.1	2862571.8	#N/A	731.00	730.50	731.40	730.30	#N/A	731.52	728.82	729.37	730.71	729.82
MW17-17	1071404.3	2863062.3	#N/A	#N/A	728.80	729.76	741.24	731.40	730.15	727.26	727.69	729.19	728.10
MW17-18	1071395.3	2863055.3	#N/A	#N/A	739.86	744.04	739.02	740.27	738.81	736.98	738.01	739.48	737.56
PW1D	1070801.4	2862836.5	746.91	750.16	749.40	749.92	749.35	#N/A	749.02	747.67	748.53	749.64	748.53
PW1S	1070805.2	2862839.5	750.24	750.56	749.70	750.73	749.63	#N/A	749.14	747.94	748.79	749.96	748.78
PW2D	1070871.7	2862905.9	751.38	751.43	750.71	751.12	750.40	#N/A	749.97	748.84	749.47	750.52	749.36
PW2S	1070876.6	2862910.4	752.89	752.51	752.28	752.98	751.88	#N/A	751.69	750.89	751.13	752.36	751.03
PW3D	1070940.5	2862972.7	750.37	751.38	750.74	750.70	750.56	#N/A	749.93	748.92	749.57	750.54	749.47
PW3S	1070943.7	2862976.5	751.36	751.34	750.71	750.74	750.58	#N/A	750.00	748.99	749.67	750.58	749.52
PW4D	1070997.8	2863028.1	749.45	749.41	748.91	748.86	748.68	#N/A	748.43	747.81	748.26	748.87	748.28
PW4S	1071002.5	2863032.7	749.24	749.21	748.77	748.72	748.43	#N/A	748.21	747.62	748.04	748.62	748.00
PZ-2D	1070625.0	2863088.7	#N/A	756.18	755.61	755.85	755.44	755.95	754.40	752.65	753.56	755.52	754.64
PZ-2S	1070621.3	2863096.7	#N/A	756.16	755.32	755.72	755.32	755.81	754.34	752.60	754.51	755.23	753.78
PZ-3	1070835.0	2863199.5	#N/A	754.42	753.92	753.87	753.91	754.15	753.21	751.92	752.92	753.49	752.80
PZ-5	1071045.2	2863118.0	#N/A	742.72	742.62	742.67	742.69	742.81	742.81	742.67	742.71	742.84	742.81

#N/A - Not Measured

Table 3
Surface Water Weir Measurements
Permeable Reactive Wall, Interim Remedial Action, NECOU

Date	Staff Levels (ft)		Flow Rate (cfs)		Flow Rate (gpm)		Stream Gain (+) or Loss (-) (gpm)
	Downstream North Weir	Upstream South Weir	Downstream North Weir	Upstream South Weir	Downstream North Weir	Upstream South Weir	
7/21/00	0.22	0.20	0.055	0.044	24.8	19.6	5.3
7/24/00	0.17	0.15	0.029	0.021	13.0	9.5	3.5
7/25/00	0.10	0.12	0.008	0.012	3.5	5.5	-2.0
7/26/00	0.05	0.10	0.001	0.008	0.6	3.5	-2.8
7/27/00	0.20	0.20	0.044	0.044	19.6	19.6	0.0
7/28/00	0.185	0.19	0.036	0.038	16.1	17.2	-1.1
7/28/00	0.51	0.50	0.453	0.431	203.2	193.4	9.8
7/29/00	0.27	0.27	0.092	0.092	41.4	41.4	0.0
7/30/00	0.22	0.22	0.055	0.055	24.8	24.8	0.0
7/31/00	0.19	0.19	0.038	0.038	17.2	17.2	0.0
8/1/00	0.165	0.17	0.027	0.029	12.1	13.0	-0.9
8/2/00	0.15	0.15	0.021	0.021	9.5	9.5	0.0
8/3/00	0.14	0.14	0.018	0.018	8.0	8.0	0.0
8/4/00	0.10	0.13	0.008	0.015	3.5	6.7	-3.2
8/7/00	0.03	0.11	0.000	0.010	0.2	4.4	-4.2
8/8/00	0.31	0.24	0.130	0.069	58.5	30.9	27.7
8/9/00	0.19	0.15	0.038	0.021	17.2	9.5	7.7
8/10/00	0.16	0.11	0.025	0.010	11.2	4.4	6.8
8/11/00	0.10	0.11	0.008	0.010	3.5	4.4	-0.9
8/12/00	0.10	0.08	0.008	0.004	3.5	2.0	1.5
8/13/00	0.00	0.09	0.000	0.006	0.0	2.7	-2.7
8/14/00	0.00	0.08	0.000	0.004	0.0	2.0	-2.0
8/15/00	0.00	0.02	0.000	0.000	0.0	0.1	-0.1
8/16/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
8/17/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
8/18/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
8/19/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
8/21/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
8/22/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
8/23/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
8/24/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
8/25/00	0.00	0.00	0.000	0.000	0.0	0.0	0.0
3/1/01	NA*	0.36	NA	0.190	NA	85.1	NA
3/13/01	NA*	0.18	NA	0.034	NA	15.0	NA
9/17/01	0.25	NA*	0.076	NA	33.9	NA	NA
10/16/01	0.48	0.29*	0.379	NA	170.2	NA	NA

ft - feet
cfs - cubic feet per second
gpm - gallons per minute
NA - not available

* Flow measurement was not recorded or is not considered reliable due to stream bed erosion at weir.

Note: Usable data from both weirs for the period since August 2000 are not available. Erosion of the stream channels occurred at both locations during this period, preventing accurate measurement of flow.

FIGURES

Figure 1
Hydrograph of Groundwater Levels
Southwest Portion of PRW

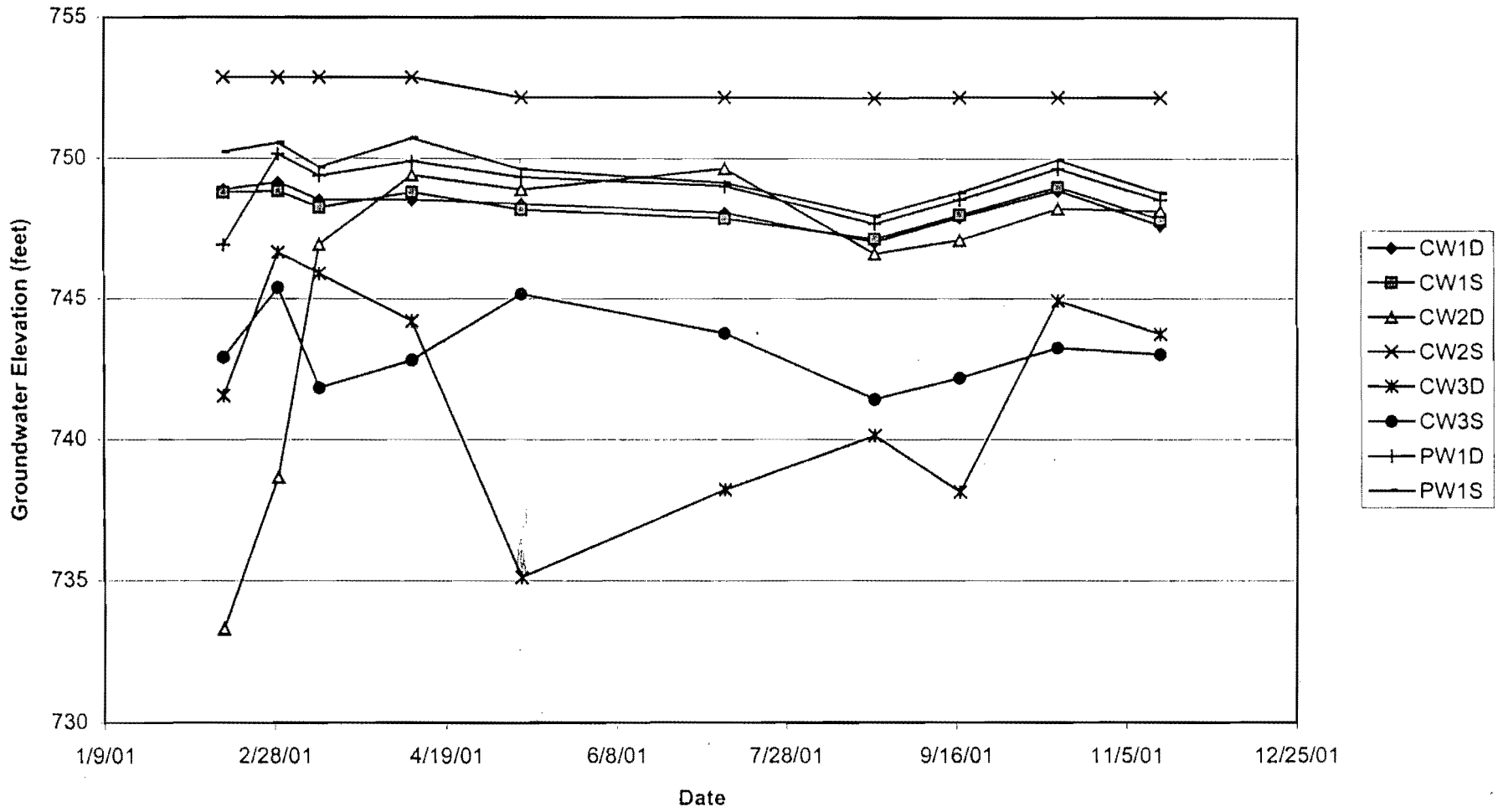


Figure 2
Hydrograph of Groundwater Levels
Central Portion of PRW

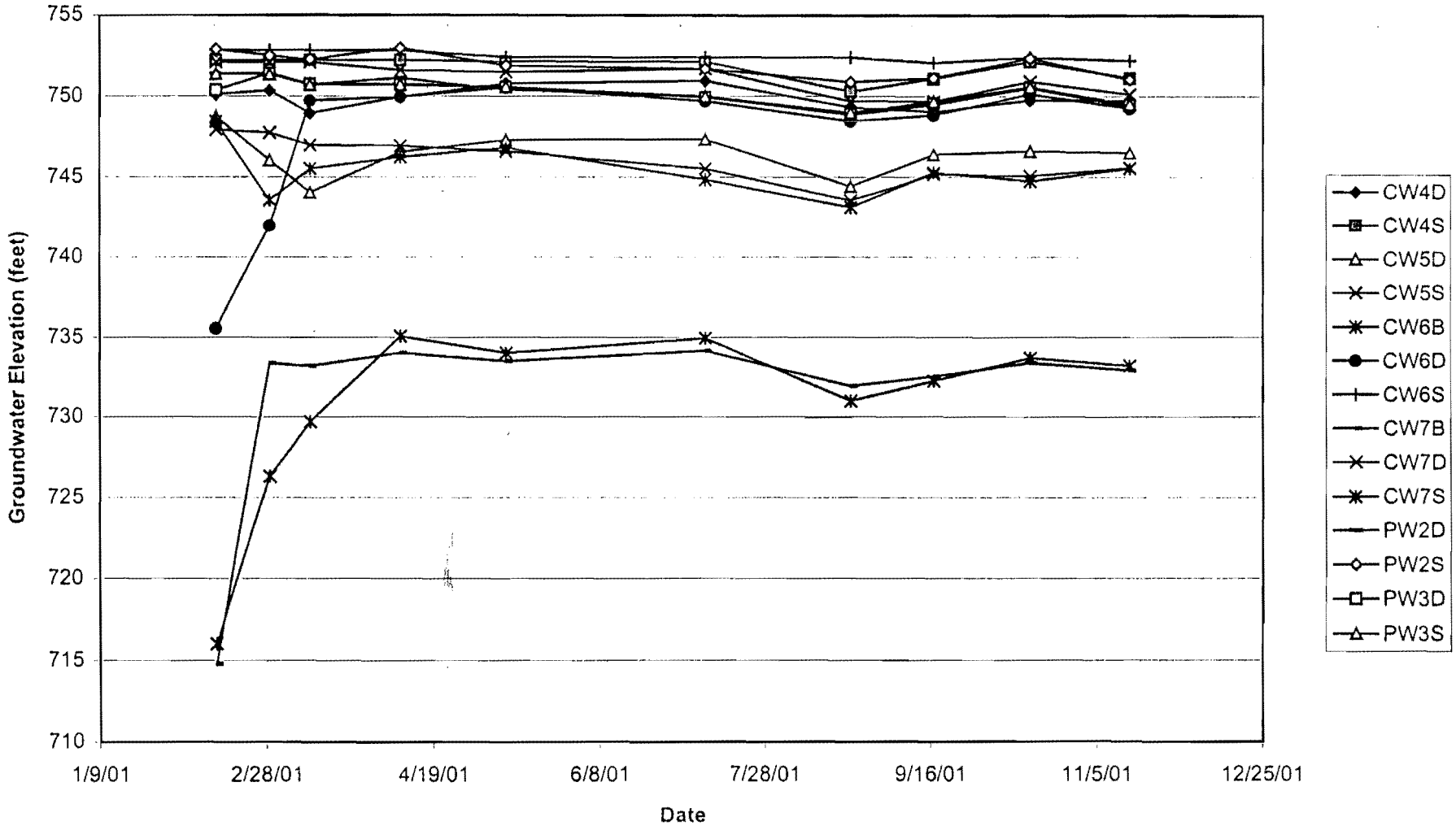


Figure 3
Hydrograph of Groundwater Levels
Northeast Portion of PRW

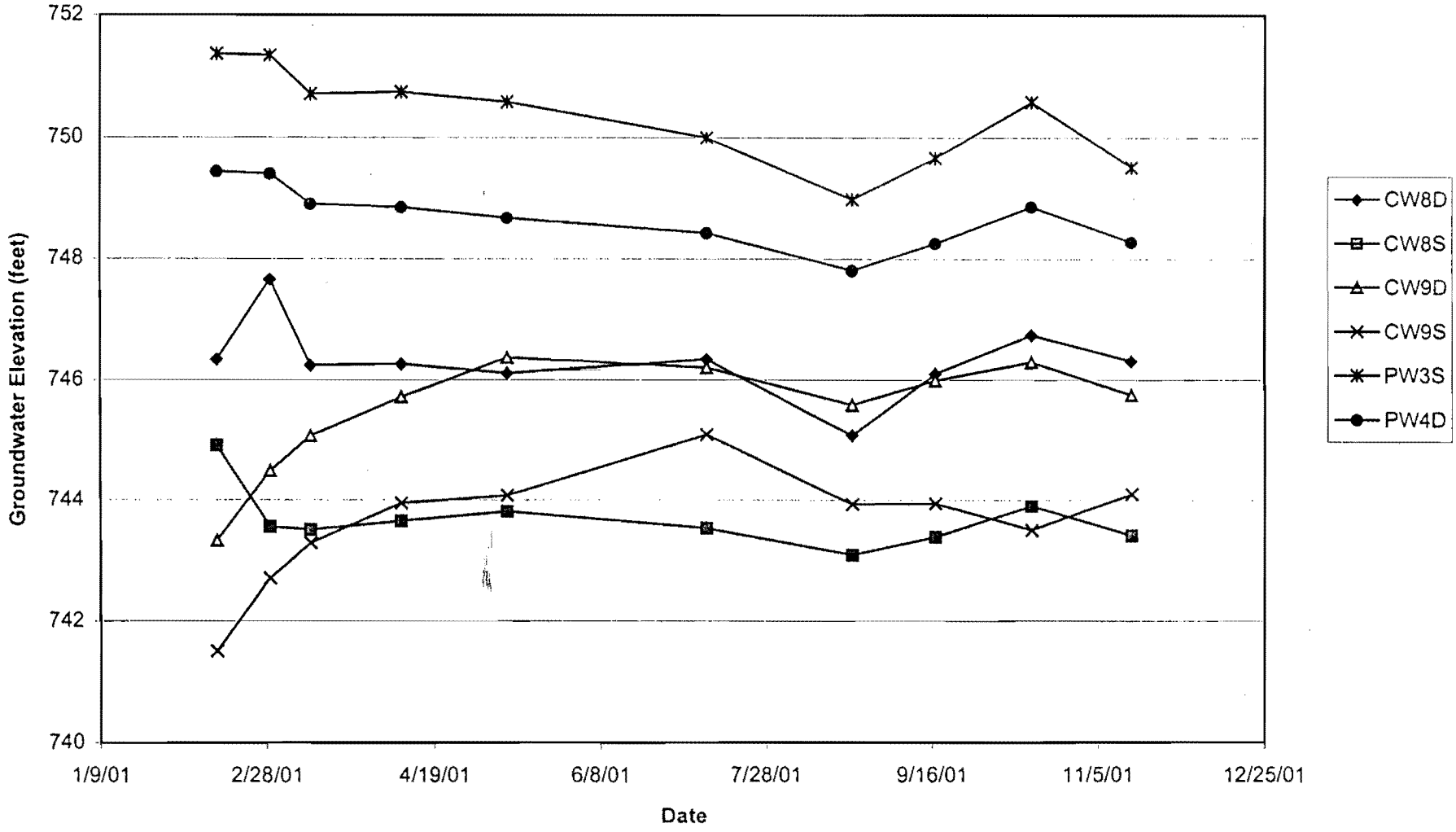


Figure 4
Head Profile Across PRW at STA 0+50 (Long View)
October 2001

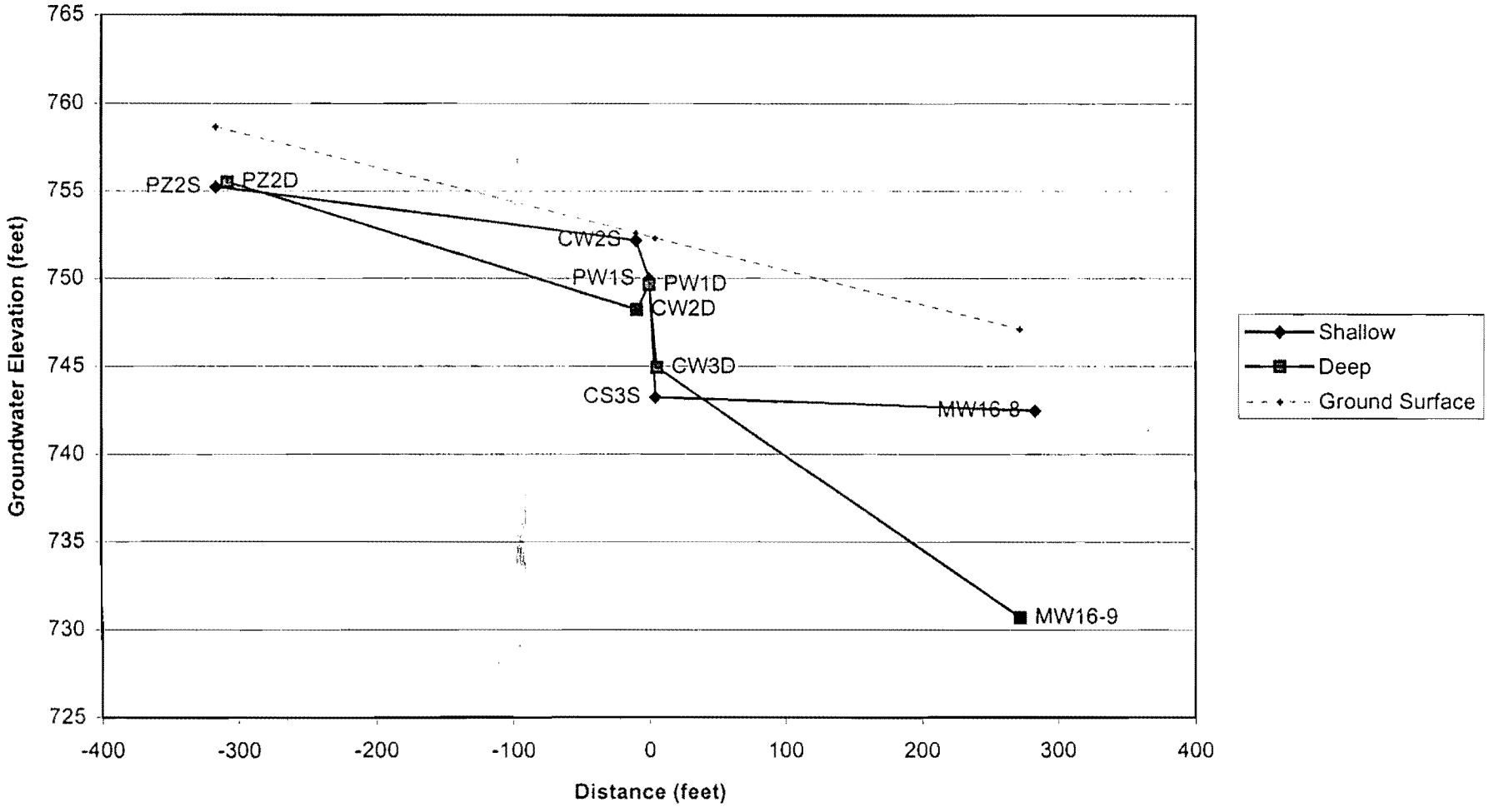


Figure 5
Head Profile Across PRW at STA 2+45 (Long View)
October 2001

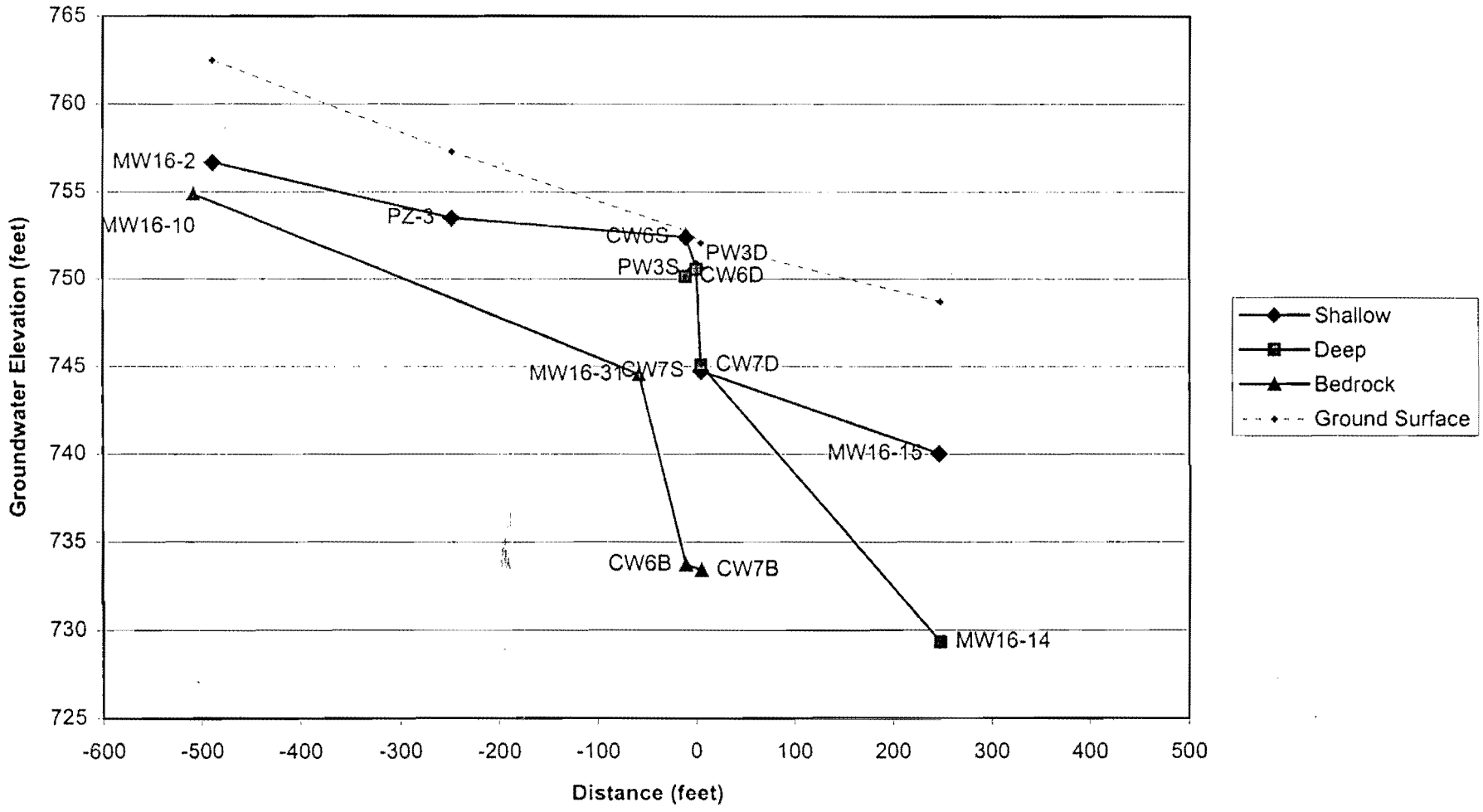


Figure 6
Head Profile Across PRW at STA 0+50
October 2001

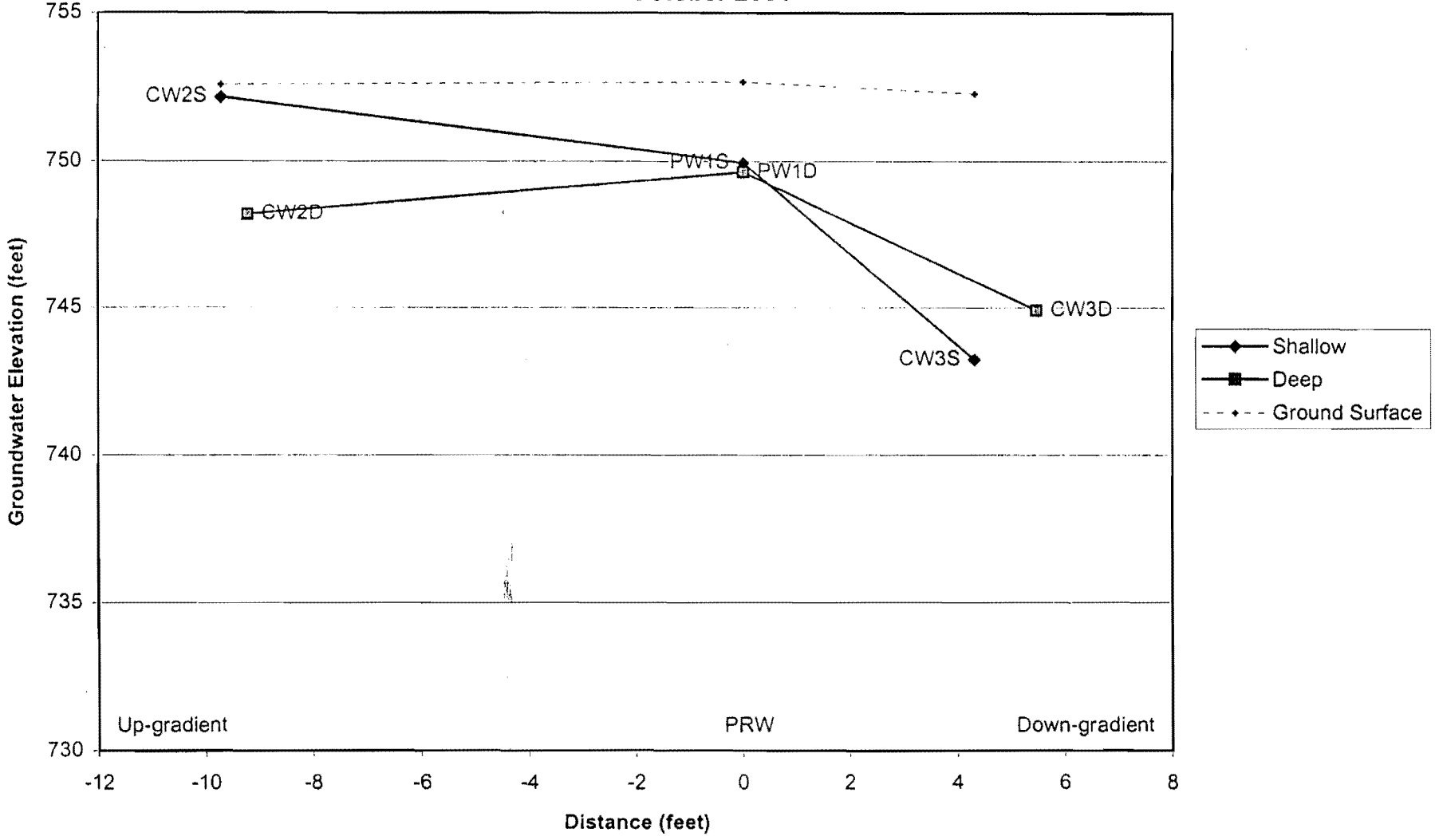


Figure 7
Head Profile Across PRW at STA 1+50
October 2001

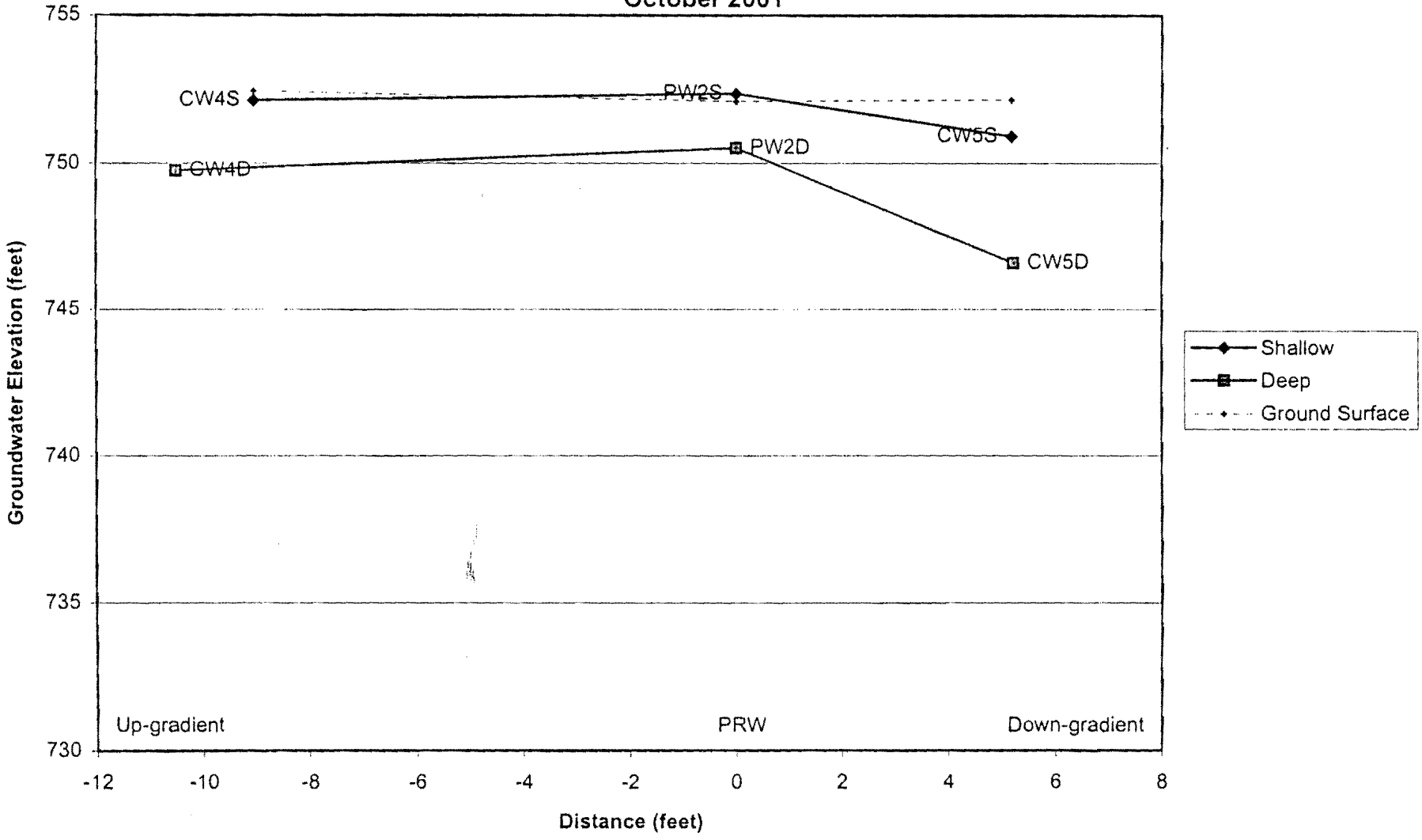


Figure 8
Head Profile Across PRW at STA 2+45
October 2001

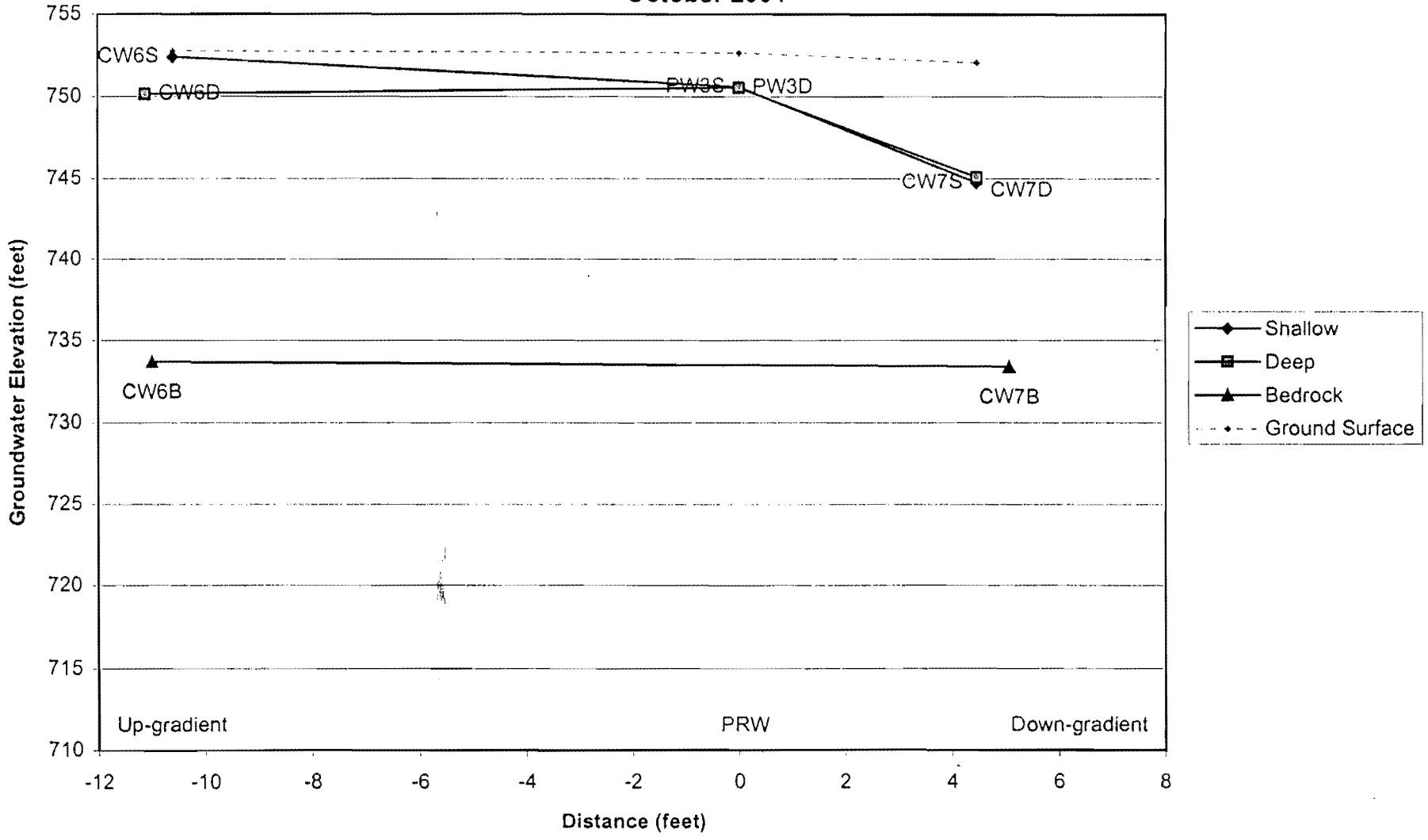


Figure 9
Head Profile Across PRW at STA 3+25
October 2001

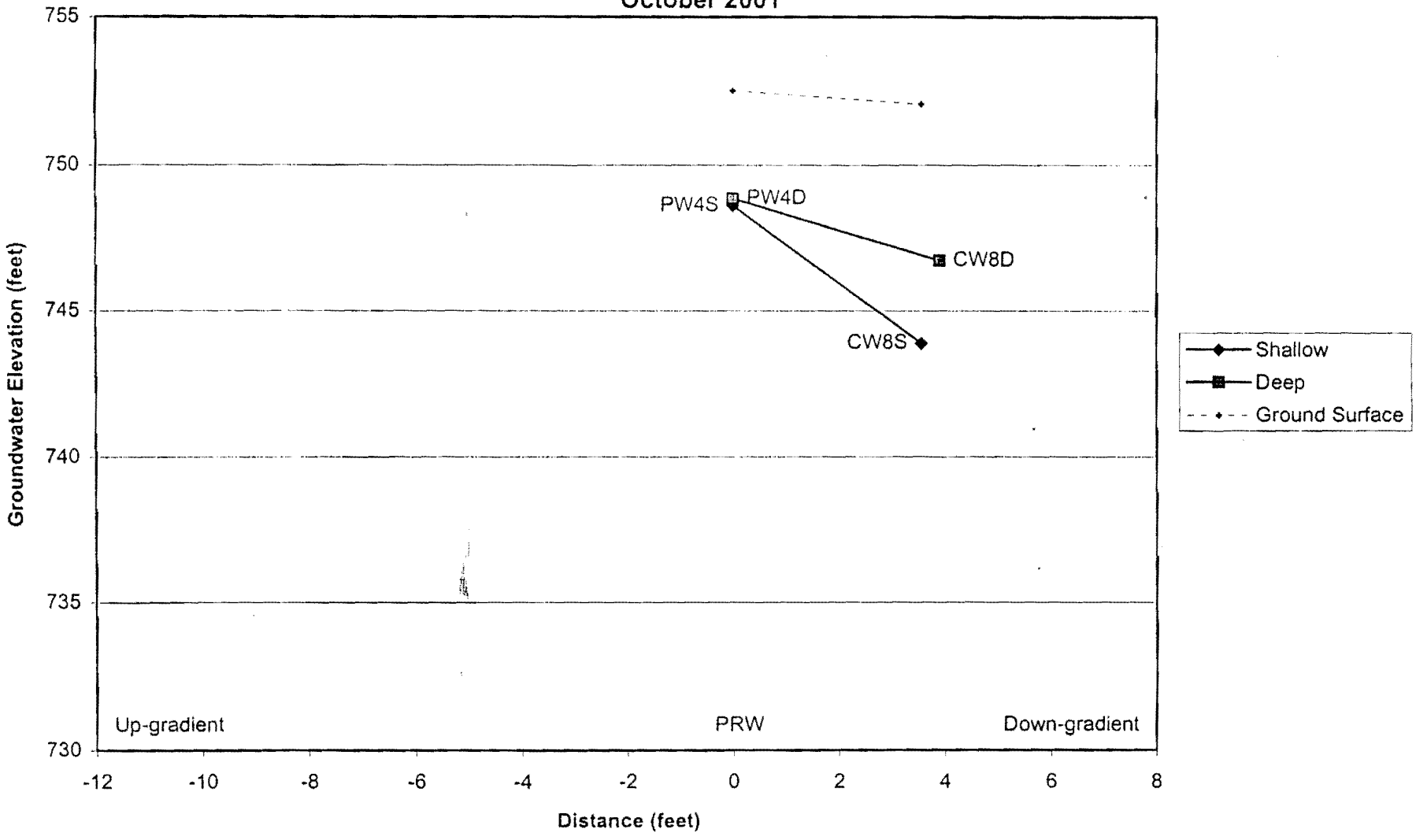


Figure 10
Head Profile Up-Gradient of PRW
October 2001

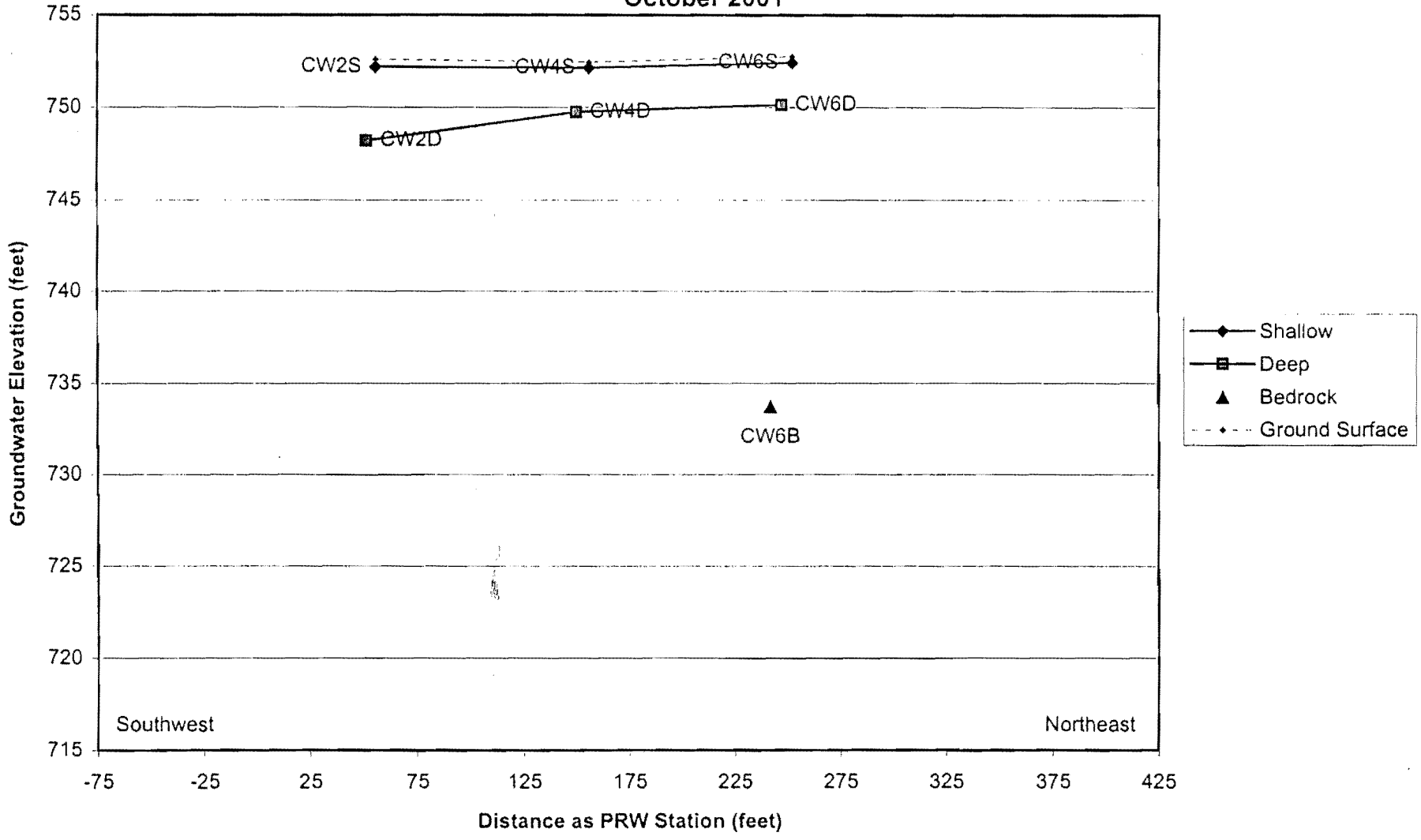


Figure 11
Head Profile Along PRW Axis
October 2001

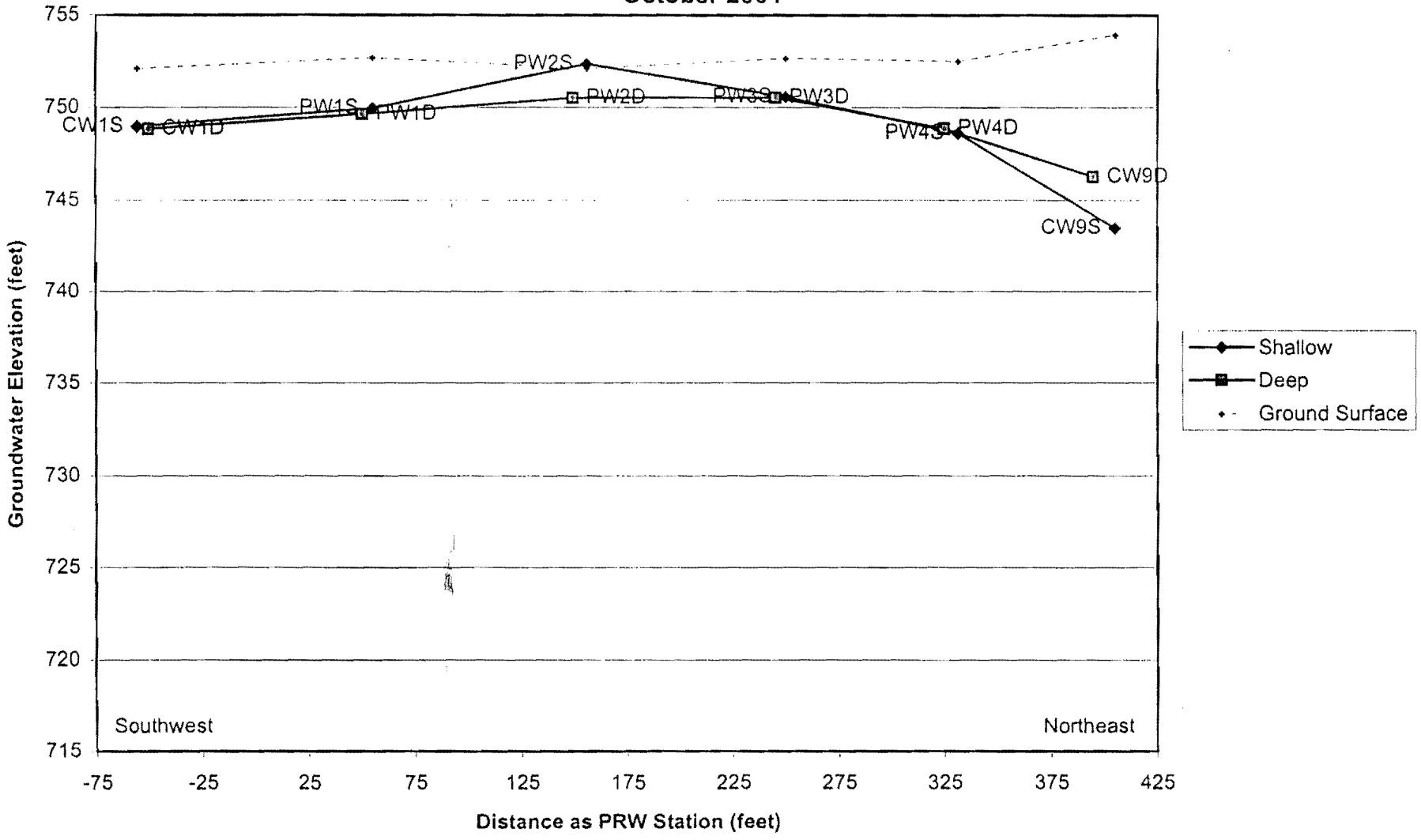


Figure 12
Head Profile Down-Gradient of PRW
October 2001

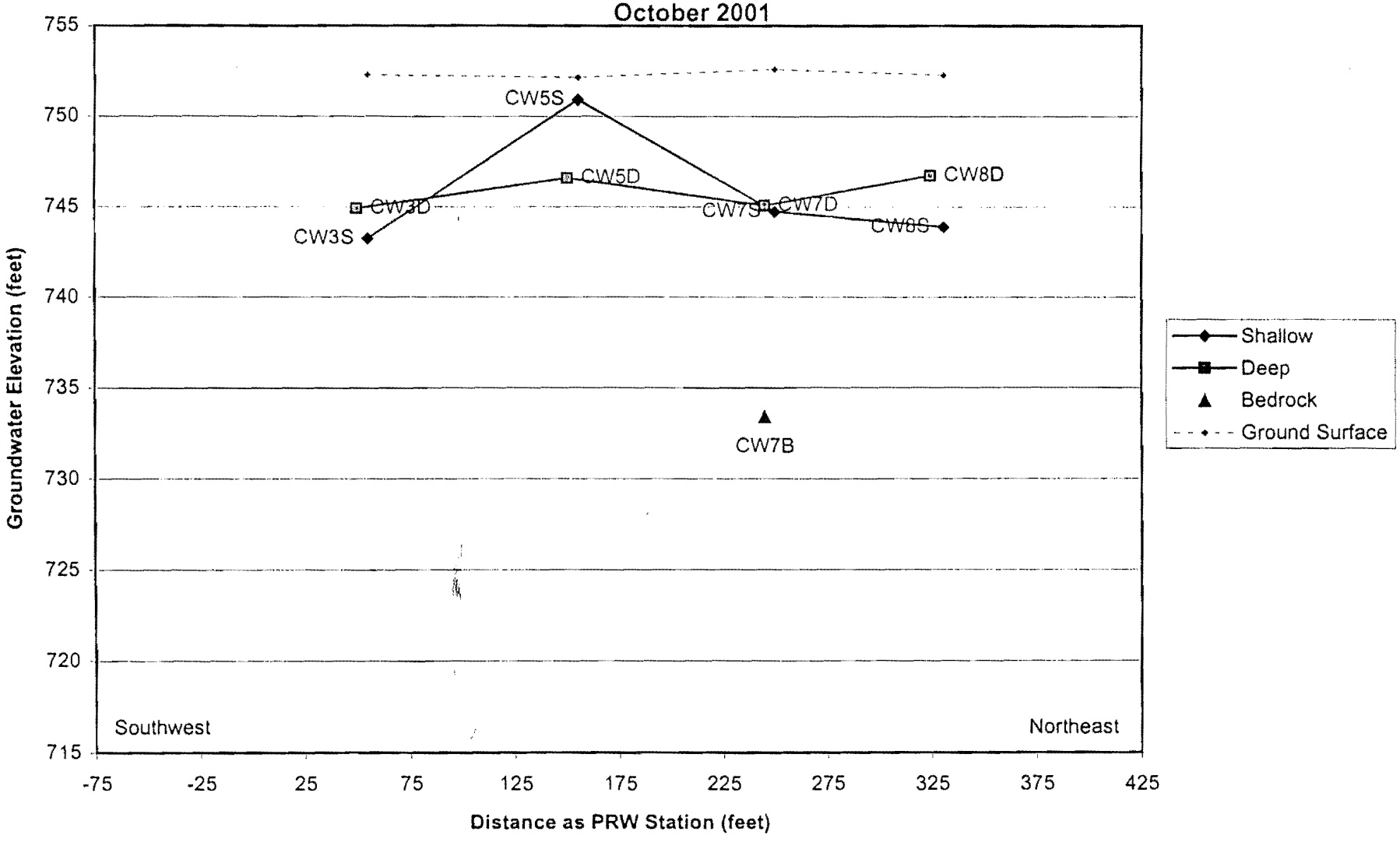
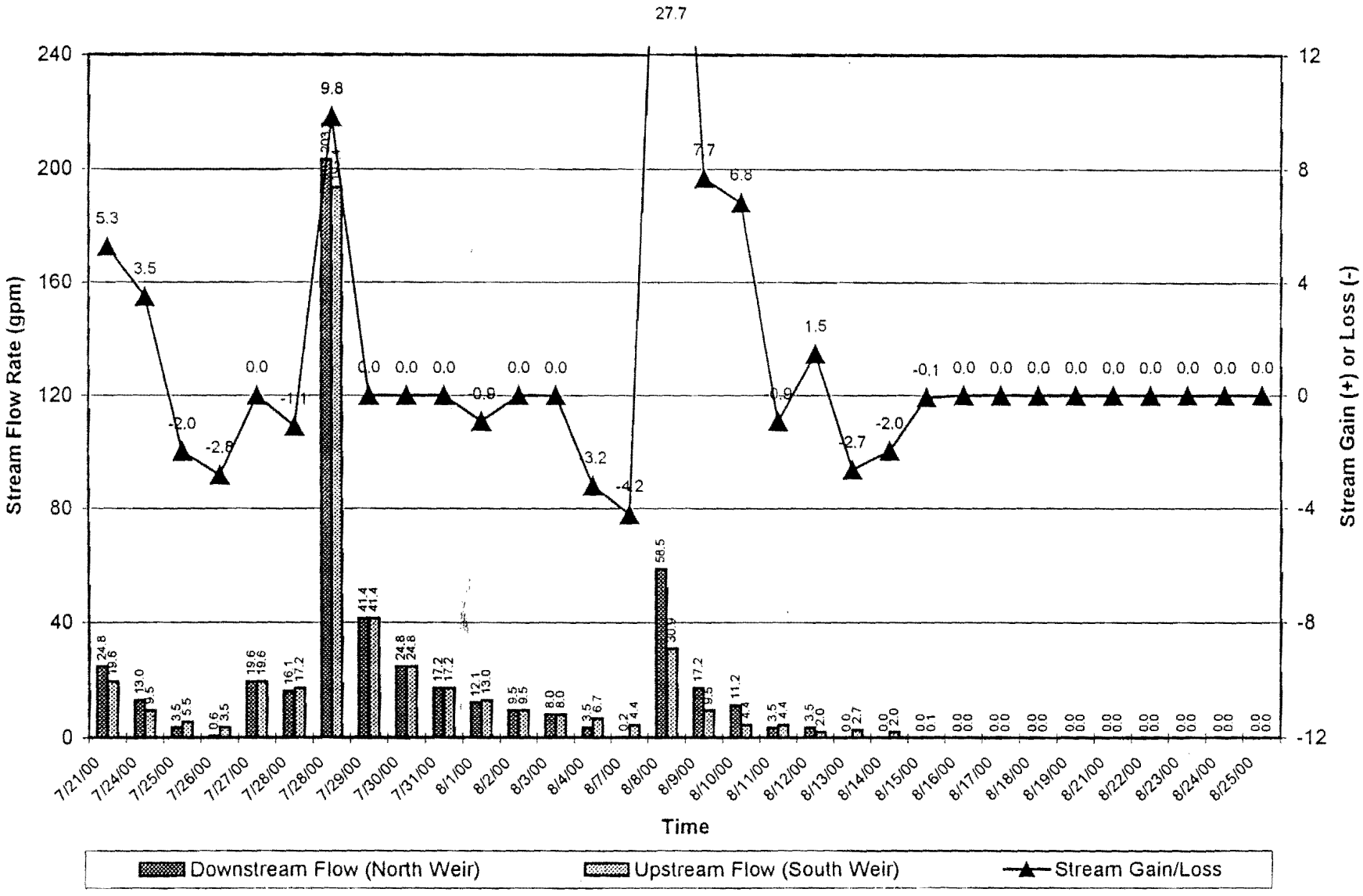


Figure 13
Stream Flow at Weirs



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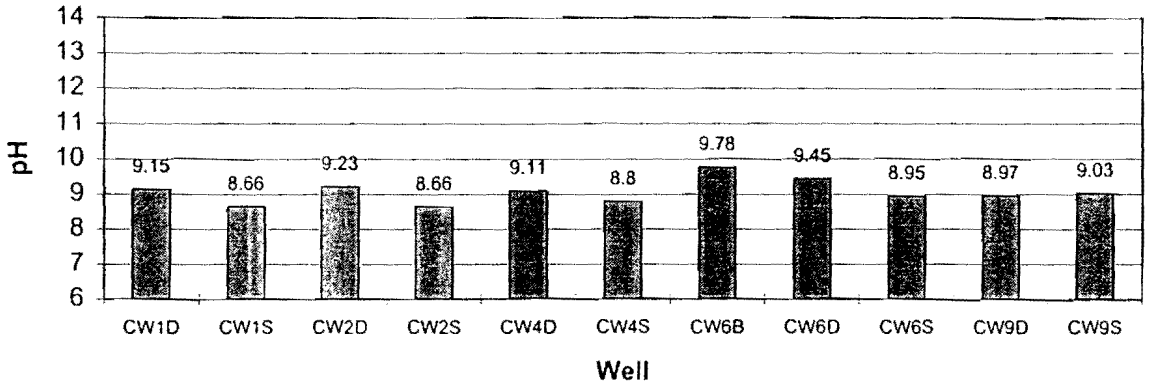
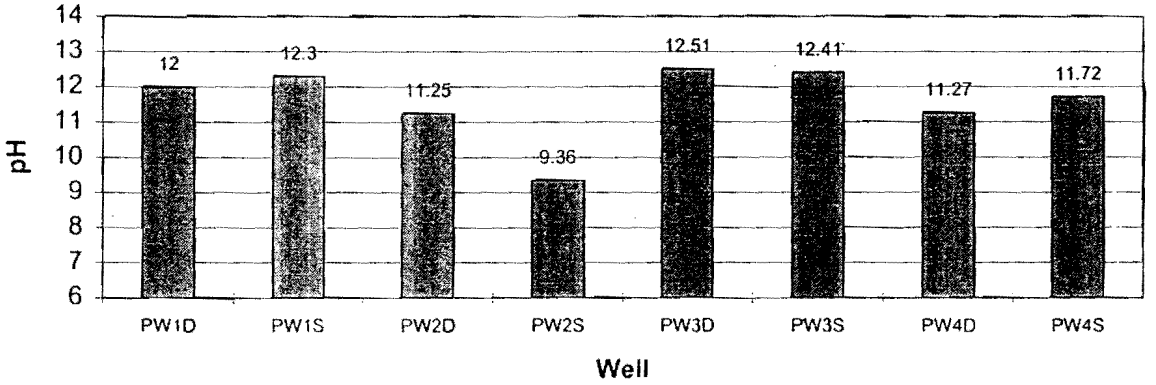
Up-Gradient & Cross-Gradient Wells



Performance Wells in PRW



Down-Gradient Wells

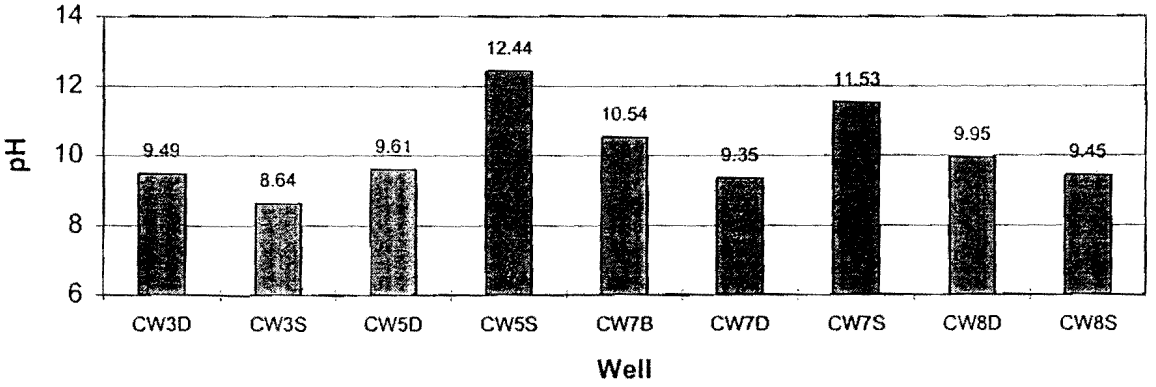


FIGURE 14

pH IN GROUNDWATER

SEPTEMBER 2001

IT CORPORATION

A Member of The IT Group

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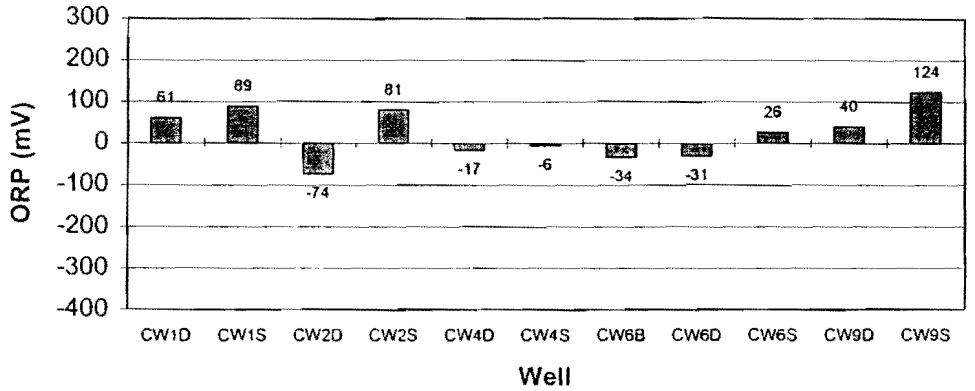
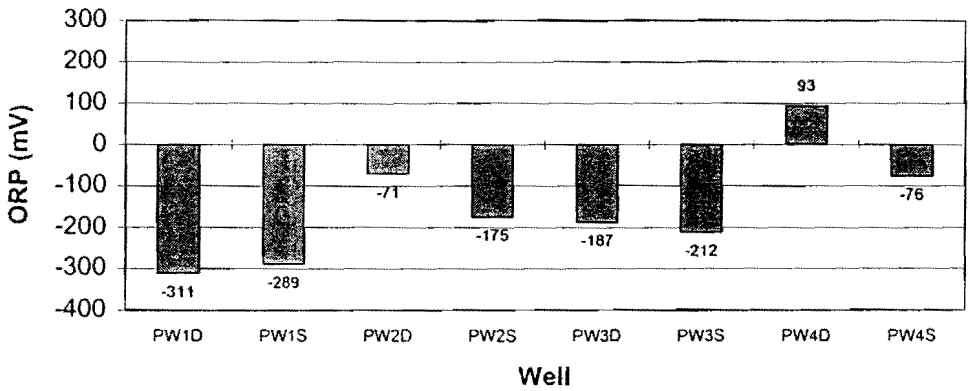
Up-Gradient & Side-Gradient Wells



Performance Wells in PRW



Down-Gradient Wells

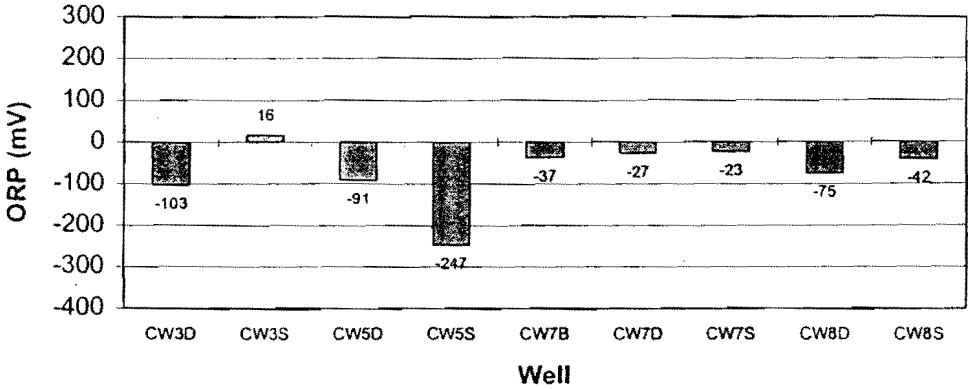


FIGURE 15

ORP IN GROUNDWATER
SEPTEMBER 2001

IT CORPORATION
A Member of The IT Group

DRAWING NUMBER 77587L-X1

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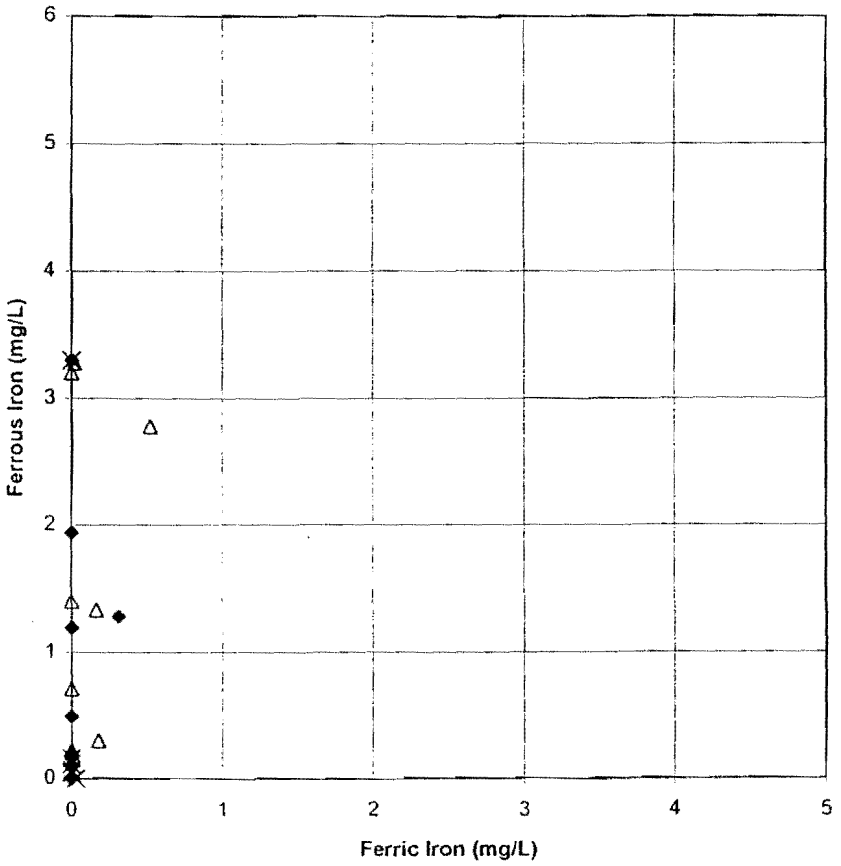

Note: Iron content of the groundwater sample from CW7B, which was very turbid, is not plotted above.

FIGURE 16

IRON SPECIATION IN GROUNDWATER

SEPTEMBER 2001

IT CORPORATION
A Member of The IT Group

DRAWING NUMBER 775871-X1

CHECKED BY / APPROVED BY

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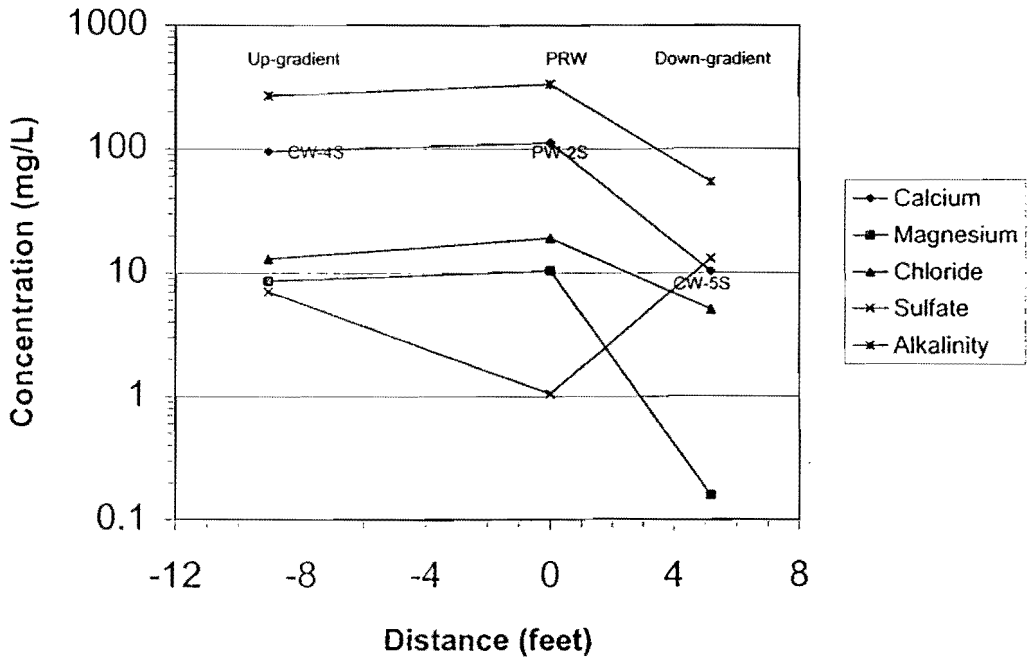
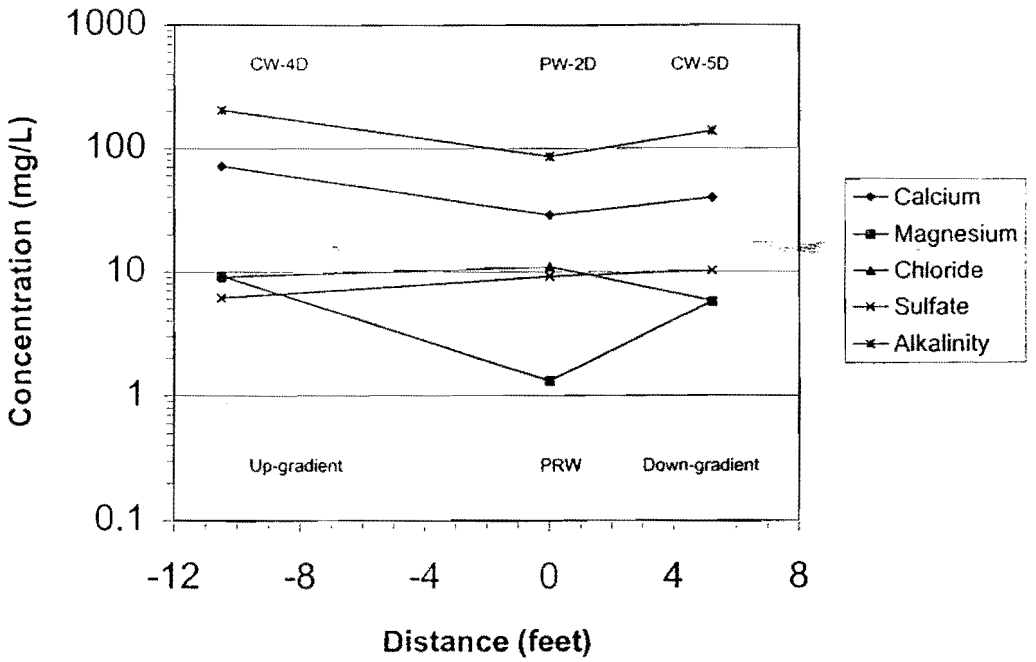
Shallow Transect at STA 1+50



Deep Transect at STA 1+50



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Note: Non-detections are plotted with a concentration of 0.1 mg/L.

FIGURE 17

MAJOR IONS IN GROUNDWATER
SEPTEMBER 2001

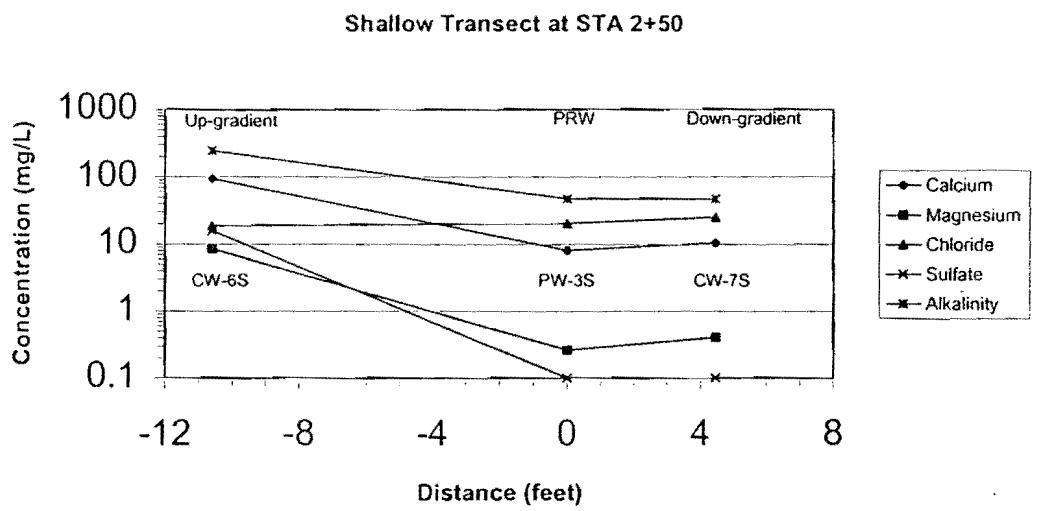
IT CORPORATION
A Member of The IT Group

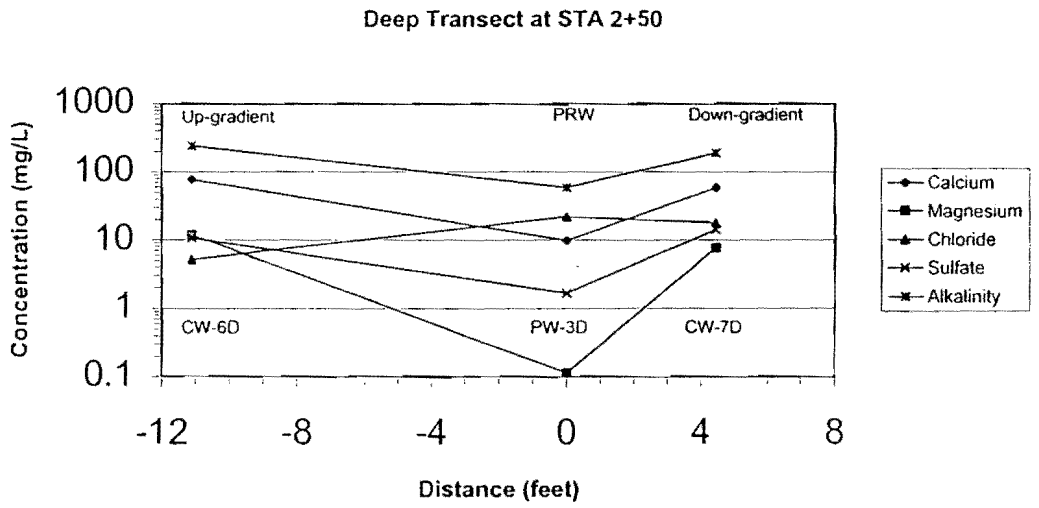
DRAWING NUMBER 77587-X1

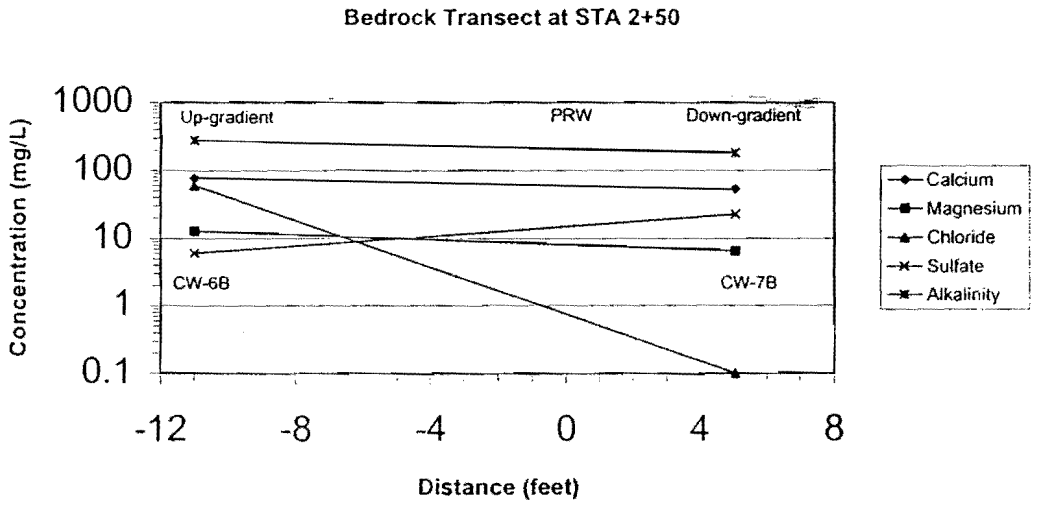
CHECKED BY / APPROVED BY

ZHT 11/7/2001

DRAWN BY







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Note: Non-detections are plotted with a concentration of 0.1 mg/L.

FIGURE 17

MAJOR IONS IN GROUNDWATER
SEPTEMBER 2001

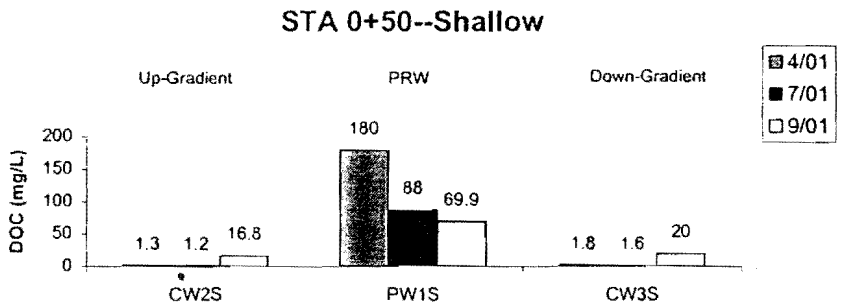
IT CORPORATION
A Member of The IT Group

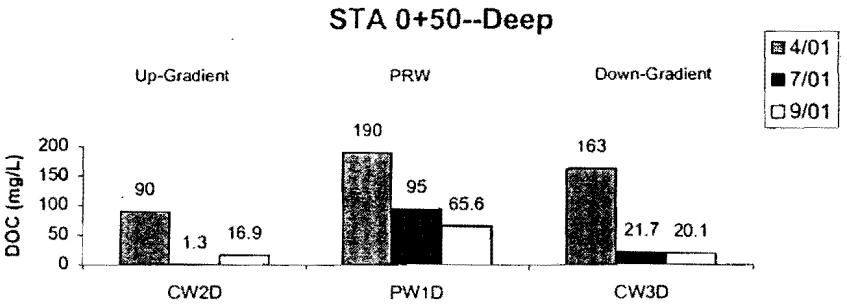
DRAWING NUMBER 77587-X1

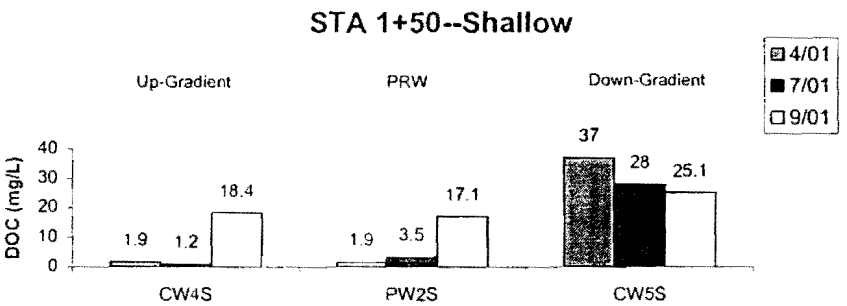
CHECKED BY APPROVED BY

ZHT 11/29/01

DRAWN BY







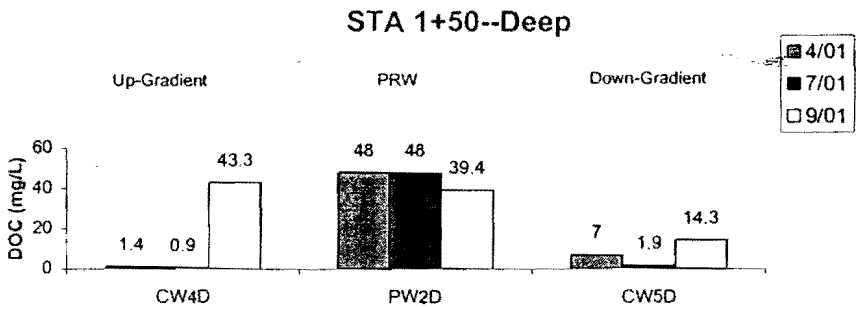


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FIGURE 18

DOC CONCENTRATIONS IN GROUNDWATER
SEPTEMBER 2001

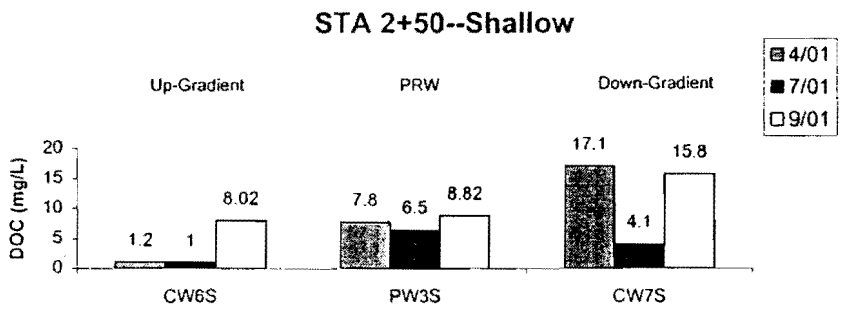
IT CORPORATION
A Member of The IT Group

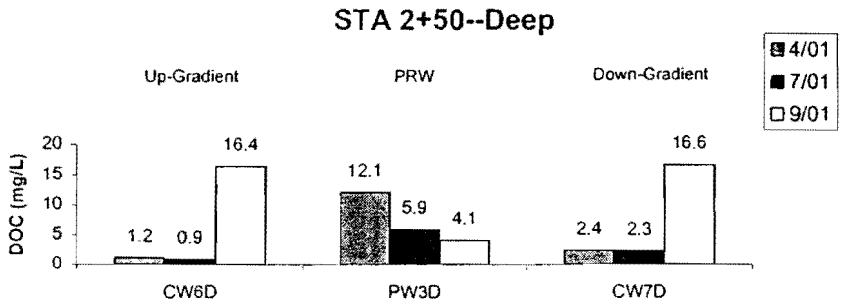
DRAWING NUMBER 775871-X1

CHECKED BY / APPROVED BY

ZHT 11/29/01

DRAWN BY





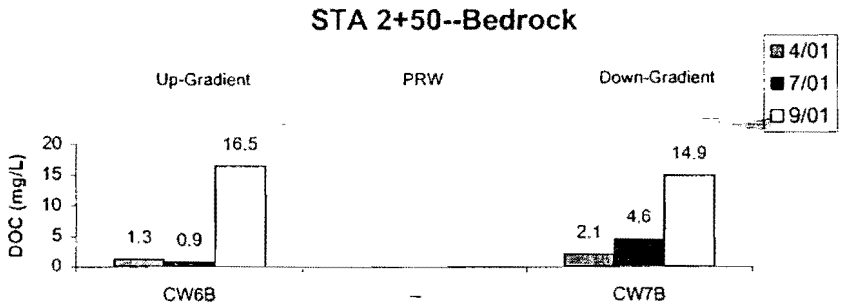


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FIGURE 18

DOC CONCENTRATIONS IN GROUNDWATER

SEPTEMBER 2001

IT CORPORATION
A Member of The IT Group

DRAWING NUMBER 775871-X1

CHECKED BY / APPROVED BY

ZHT 11/29/01

DRAWN BY

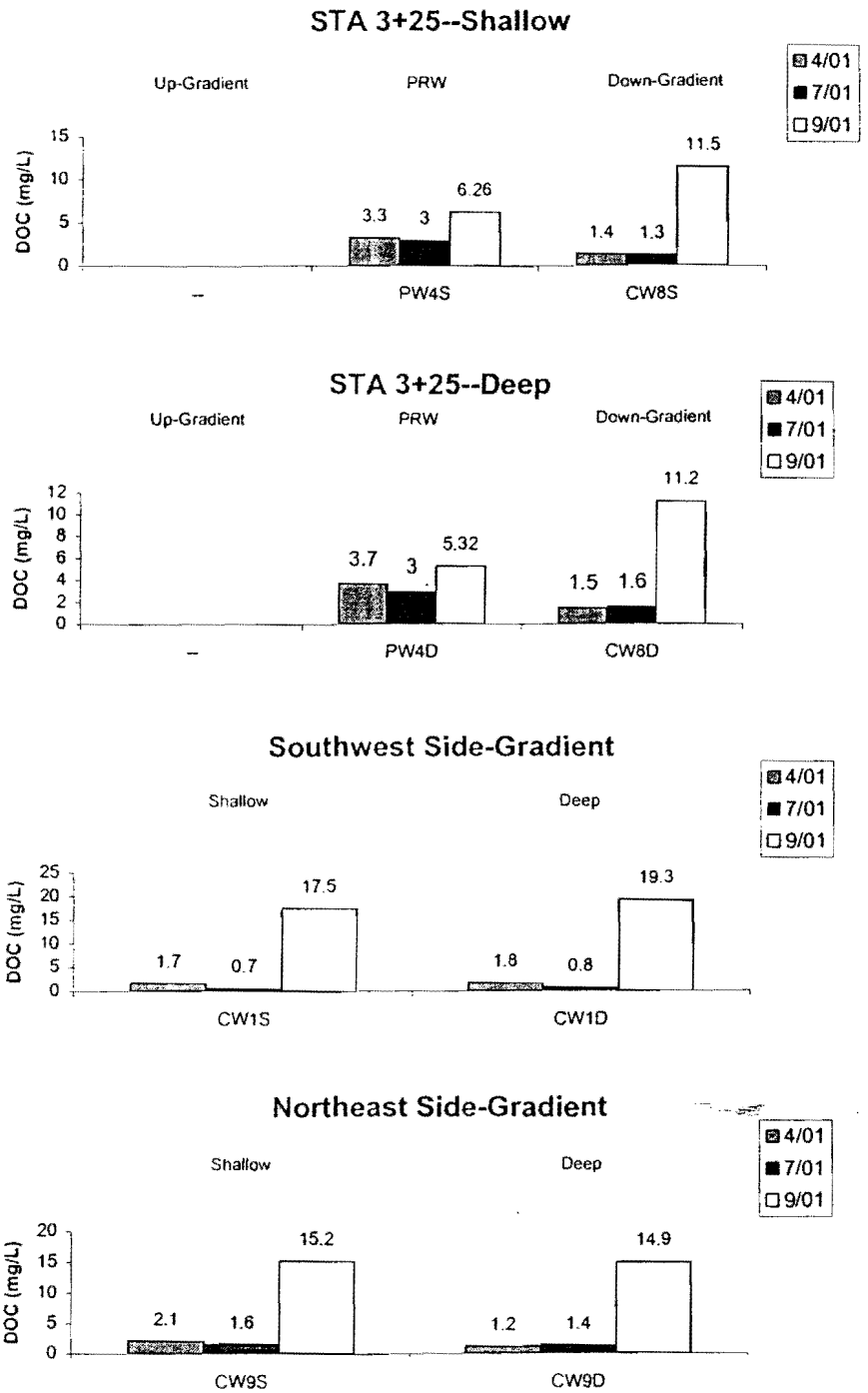

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FIGURE 18

DOC CONCENTRATIONS IN GROUNDWATER

SEPTEMBER 2001

IT CORPORATION
A Member of The IT Group

DRAWING NUMBER 775871-X1

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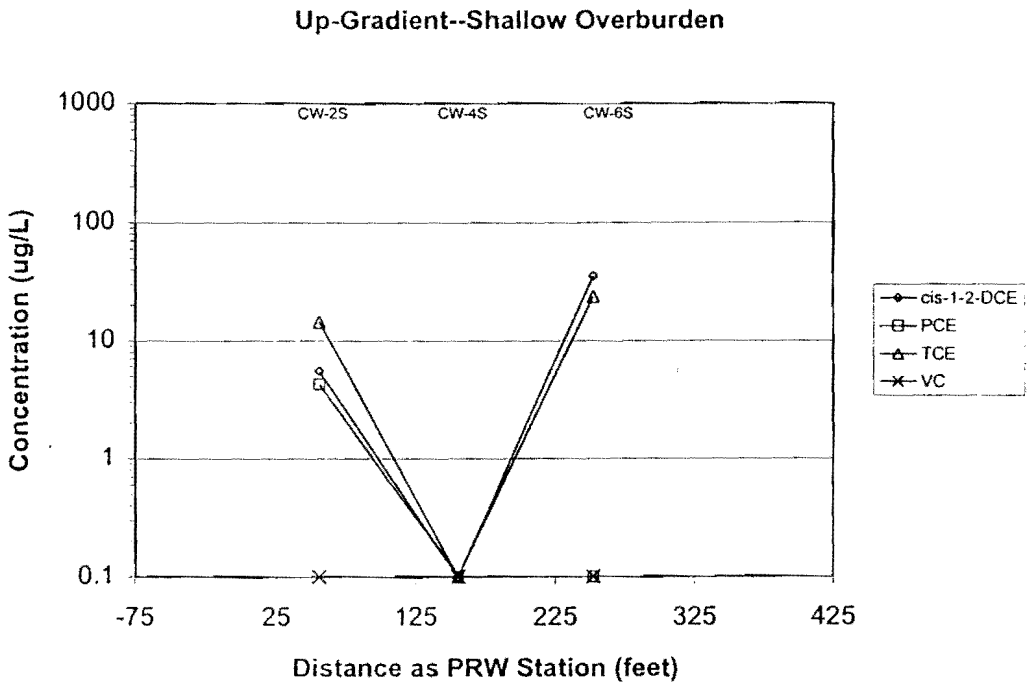
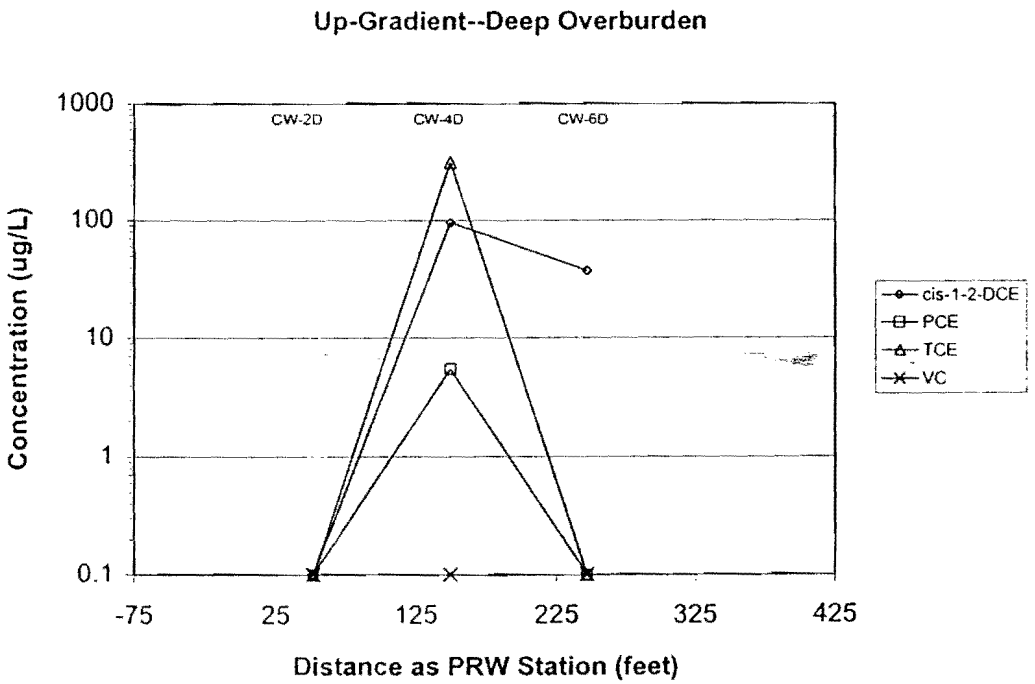




Note: Non-detections are plotted with a concentration of 0.1 ug/L.

FIGURE 19

VOC CONCENTRATIONS IN GROUNDWATER
UP-GRADIENT OF THE PRW
SEPTEMBER 2001

IT CORPORATION
A Member of The IT Group

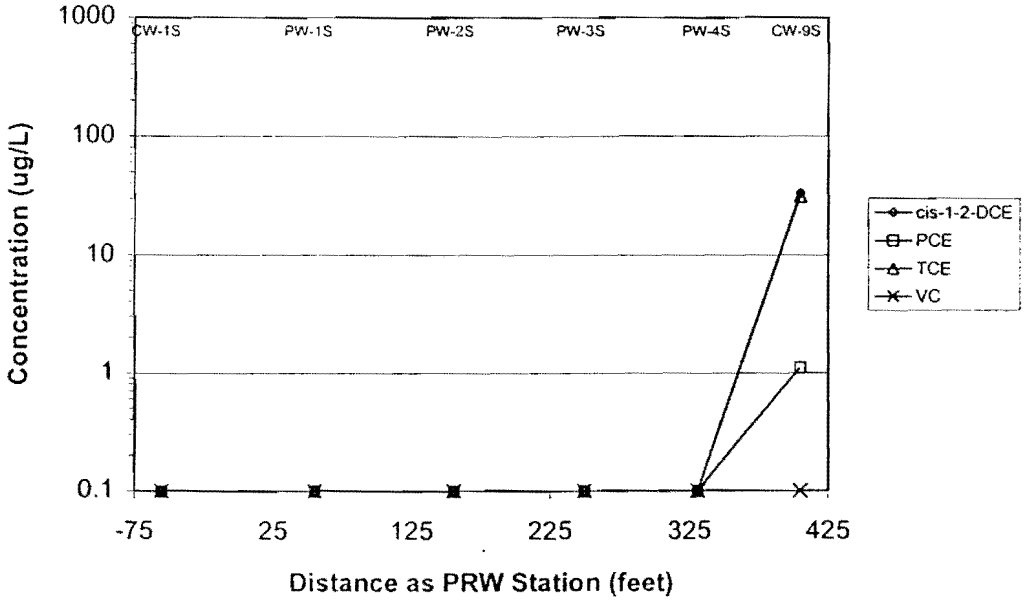
DRAWING NUMBER 77587-X1

CHECKED BY / APPROVED BY

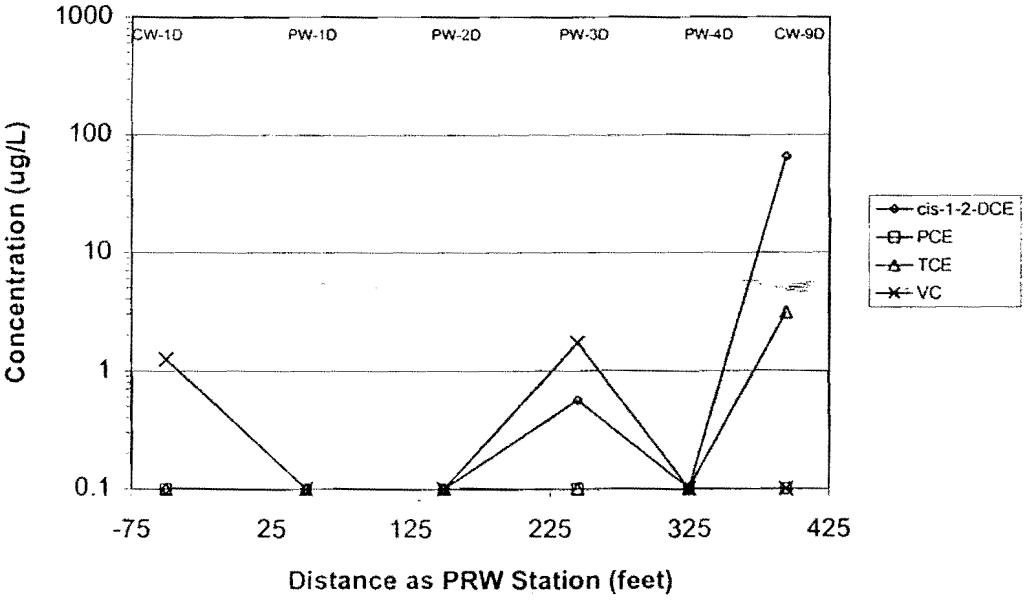
ZHT 11/7/2001

DRAWN BY

PRW Axis--Shallow Media and Overburden



PRW Axis--Deep Media and Overburden



Note: Non-detections are plotted with a concentration of 0.1 ug/L.

FIGURE 20

VOC CONCENTRATIONS IN GROUNDWATER
ALONG PRW AXIS
SEPTEMBER 2001

IT CORPORATION
A Member of The IT Group

DRAWING NUMBER 7758/71-X1

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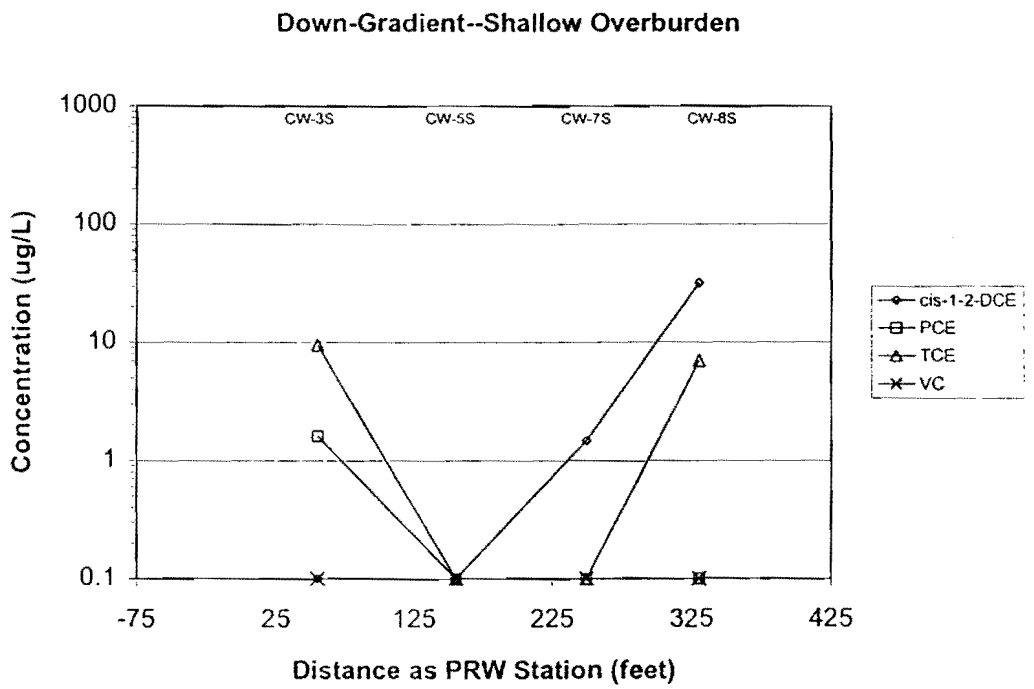
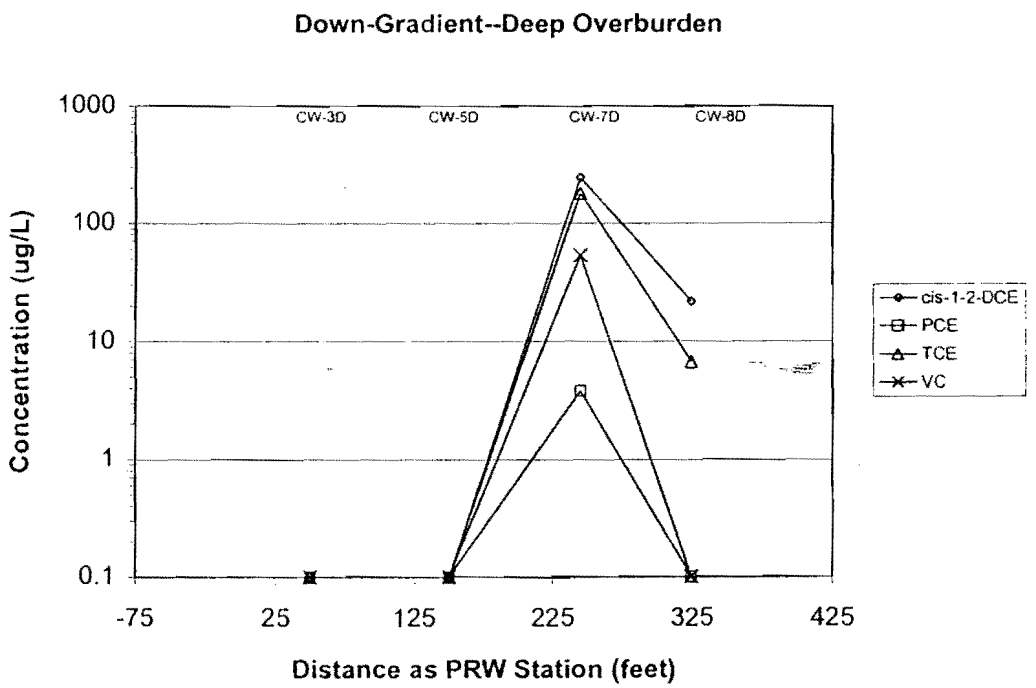




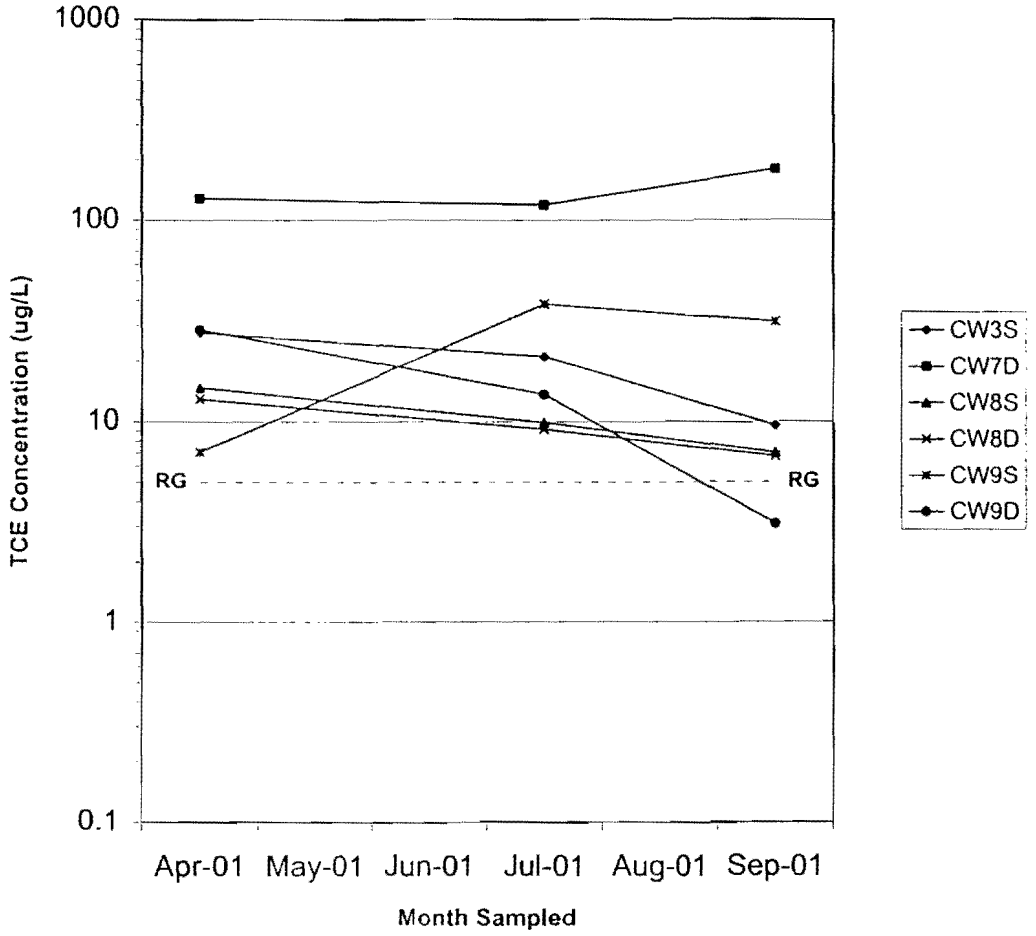
Note: Non-detections are plotted with a concentration of 0.1 ug/L.

FIGURE 21

VOC CONCENTRATIONS IN GROUNDWATER
DOWN-GRADIENT OF THE PRW
SEPTEMBER 2001

IT CORPORATION
A Member of The IT Group

DRAWN BY ZHT 11/12/01 CHECKED BY APPROVED BY DRAWING NUMBER 775871-X1



Note: Concentrations of TCE in down-gradient and side-gradient compliance wells exceeding the remediation goal (RG) of 5 ug/L are plotted.

FIGURE 22

TCE CONCENTRATION VERSUS TIME
IN GROUNDWATER
DOWN-GRADIENT AND SIDE-GRADIENT OF PRW

IT CORPORATION
A Member of The IT Group

ATTACHMENT A
WELL PURGE/SAMPLING FORMS

Well Purge/Sampling Form

Well Data

Project: LCAAP 775871 Well Number: MW16-CW-1D

Date: 9-25-01 L = Total Casing and Screen Length (ft): —

Sampler(s): B. Woody S. Smallwood W = Depth to Water (ft BTOC): 5.63 / 5.90 TOP= 36.4

PID Reading (ppm): — D = Casing diameter (in): —

Purge/Sample Method: Low Flow V = Volume of Water in Casing: —

Field Alkalinity Results: —

Field Fe II Results: FeT2 3.30 / TOTAL Fe 3.30 Total Volume Purged: 13.2 L ~ ~~20.6~~ 19.0 EV

See PW-1S for Volume Calc.

3 EV = ~~18~~ ~~+926.7~~ 2087.12ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data STARTING WATER LEVEL 5.63

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
0801	100	14.79	9.09	537	4.34	189	44.0	5.93
0804	100	15.95	9.14	524	2.36	155	26.4	5.96
0807	100	16.04	9.16	521	1.65	137	16.7	6.03
0810	100	16.05	9.17	520	1.38	131	13.3	6.03
0813	100	16.23	9.18	519	1.18	126	20.4	6.06
0816	100	16.14	9.19	526	0.96	122	31.7	6.07
0819	100	16.14	9.19	526	0.88	119	42.4	6.10
0822	100	16.25	9.19	527	0.73	116	45.0	6.12
0825	100	16.22	9.18	521	0.60	113	76.1	6.14
0828	100	16.15	9.18	521	0.58	112	95.4	6.14
0831	100	16.20	9.19	520	0.54	111	112	6.14
0834	100	16.22	9.19	523	0.48	111	125	6.14
0837	50	16.35	9.19	522	0.39	111	149	6.06
0840	50	16.47	9.19	522	0.40	110	153	5.99
0843	50	16.77	9.19	523	0.38	110	164	5.95

Observations: Very Turbid water

Sample ID: MW16-CW-1D Sample Date: 9-25-01 Sample Time: 11:55

Analytes: VOC, DOC

Well Purge/Sampling Form

Purge Data MW16-CW-1D **Page** 2 **of** 3

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
[redacted]	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
0846	50	17.12	9.18	523	0.37	109	145	5.95
0849	50	17.19	9.18	523	0.37	108	156	5.95
0852	50	17.36	9.18	524	0.36	107	139	5.95
0855	50	17.47	9.17	526	0.33	107	95.2	5.95
0858	50	17.53	9.17	526	0.33	104	105.8	5.95
0901	50	17.66	9.17	525	0.31	104	85.4	5.95
0904	50	17.70	9.17	526	0.31	103	123	5.95
0907	50	17.71	9.16	527	0.29	102	93.3	5.95
0910	50	17.71	9.16	528	0.29	100	94.1	5.95
0913	50	17.91	9.15	528	0.29	100	90.1	5.95
0916	50	17.99	9.16	530	0.29	99	81.8	5.95
0919	50	18.03	9.16	529	0.29	99	225	5.95
0922	50	18.08	9.16	530	0.27	98	219	5.95
0925	50	18.14	9.16	525	0.28	97	233	5.95
0928	50	18.19	9.16	533	0.27	97	230	5.95
0931	50	18.33	9.15	531	0.29	97	243	5.95
0934	50	18.40	9.16	533	0.27	95	225	5.95
0939	50	18.30	9.15	533	0.26	94	217	5.95
0940	50	18.38	9.15	531	0.26	93	212	5.95
0943	50	18.40	9.15	529	0.25	93	205	5.93
0946	50	18.63	9.15	529	0.24	92	197	5.93
0949	50	18.67	9.15	528	0.24	91	192	5.93
0952	50	18.60	9.15	529	0.25	89	187	5.93
0955	50	18.81	9.15	528	0.23	88	189	5.93
0958	50	18.48	9.15	529	0.25	87	180	5.93
1001	50	18.96	9.15	528	0.24	86	183	5.93
1004	50	19.03	9.15	529	0.23	85	173	5.93
1007	50	19.06	9.15	529	0.25	84	168	5.93
1010	50	19.06	9.15	528	0.24	83	169	5.93
1013	50	19.22	9.15	529	0.23	83	159	5.93
1016	50	19.39	9.15	530	0.24	82	160	5.93
1019	50	19.31	9.15	529	0.23	81	158	5.93
1022	50	19.33	9.15	528	0.23	80	150	5.93
1025	50	19.40	9.15	531	0.22	80	145	5.93
1028	50	19.42	9.15	531	0.23	79	137	5.93
1031	50	19.53	9.15	530	0.22	78	136	5.93
1034	50	19.55	9.15	533	0.21	77	133	5.93
1037	50	19.68	9.15	532	0.21	76	134	5.93
1040	50	19.74	9.15	534	0.21	75	129	5.93
1043	50	19.75	9.15	532	0.21	75	129	5.93
1046	50	19.68	9.15	532	0.22	73	121	5.93
1049	50	19.91	9.15	532	0.23	73	125	5.93
1052	50	19.89	9.15	531	0.21	72	122	5.93
1055	50	20.06	9.15	530	0.21	71	121	5.93
1058	50	20.14	9.15	531	0.20	70	114	5.93
1101	50	20.25	9.15	531	0.21	69	110	5.93

Well Purge/Sampling Form

Purge Data MW 16-CW-1D

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
1104	50	20.16	9.15	532	0.21	68	111	5.93
1107	50	20.25	9.15	537	0.21	68	109.5	5.93
1110	50	20.20	9.15	529	0.21	67	104.7	5.93
1113	50	20.13	9.15	530	0.21	67	105	5.93
1116	50	20.33	9.15	528	0.20	66	101.6	5.93
1119	50	20.37	9.15	527	0.20	66	99.4	5.93
1122	50	20.60	9.15	528	0.20	66	95.2	5.93
1125	50	20.63	9.15	525	0.19	65	96.7	5.93
1128	50	20.63	9.15	525	0.19	65	97.3	5.93
1131	50	20.69	9.15	525	0.20	64	91.1	5.92
1134	50	20.67	9.15	525	0.19	63	88.4	5.92
1137	50	20.68	9.15	525	0.19	63	82.3	5.92
1140	50	20.77	9.15	527	0.20	62	64.7	5.92
1143	50	20.98	9.15	524	0.21	62	53.0	5.92
1146	50	20.94	9.15	527	0.21	61	46.2	5.92

Well Purge/Sampling Form

Well Data

Project: LCAAP 775 871
Date: 9-24-01
Sampler(s): R. Woody S. Smallwood
PID Reading (ppm): —
Purge/Sample Method: Low Flow
Field Alkalinity Results: —
Field Fe II Results: Fe+2 0.06 / Total 0.09

Well Number: MW16-CW-1S
L = Total Casing and Screen Length (ft): —
W = Depth to Water (ft BTOC): 5.55 / 5.71 TOP = 11.75
D = Casing diameter (in): —
V = Volume of Water in Casing: —
Total Volume Purged: 36 L = ~ ~~8.8~~ 7.8 ~~10.7~~ EV

See PW-1S for Calculation

3 EV = ~~1228.1~~ ml
~~1226.7~~
1384.9

Well Volume Calculation:
$V = 0.0408(D)^2 X (L - W)$
$V = 0.0408(\ )^2 X (\ \ \ ) =$ _____ gallons

Purge Data

Starting Water level = 5.55

Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
		Water Quality Parameters						
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1612	100	18.91	8.89	337	7.04	107	7.67	5.93
1615	100	18.90	8.75	347	2.33	105	5.48	5.95
1618	100	18.92	8.71	343	2.06	102	4.80	5.97
1621	100	18.93	8.68	342	1.56	95	3.77	5.97
1624	100	18.94	8.67	346	1.15	92	3.20	5.97
1627	100	18.94	8.67	346	0.91	89	4.09	5.97
1630	100	18.99	8.66	347	0.77	87	3.88	5.97
1633	100	18.98	8.66	351	0.72	86	3.71	5.97
1636	100	18.96	8.65	350	0.59	87	3.31	5.97
1639	100	18.93	8.65	357	0.65	87	3.12	5.97
1642	100	18.88	8.66	356	0.69	88	3.25	5.97
1645	100	18.90	8.66	357	0.63	89	3.81	5.97

Observations: _____

Sample ID: MW16-CW-1S Sample Date: 9-24-01 Sample Time: 1650

Analytes: VOC, DOC

Well Purge/Sampling Form

Well Data

Project: LCAAP

Date: 9-24-01

Sampler(s): B Woody S Smallwood

PID Reading (ppm): —

Purge/Sample Method: Low Flow

Field Alkalinity Results: —

Field Fe II Results: Fe+2 3.30 / TOTAL Fe 3.30

Well Number: MW16-CW-2D

L = Total Casing and Screen Length (ft): —

W = Depth to Water (ft BTOC): 461 / 7.24 TOP = 4 8.9

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: 11.4 L = ~~14.8~~ 14.0 EV

see PW-15 for Volume Calc.

3 EV = ~~2313.4 ml~~ 2444.8 ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

Starting WL = 4.61' TOC

Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
		Water Quality Parameters						
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1312	~~100 / 4.71~~	19.71	9.03	516	2.26	-51	~~147 / 47~~	5.14
1315	100	18.65	8.92	504	1.55	-52	83.3	5.33
1318	100	18.32	8.89	510	1.18	-57	66.1	5.62
1321	100	18.28	8.89	504	0.73	-60	76.8	5.81
1324	100	18.24	8.90	501	0.59	-62	104.7	5.91
1327	100	17.96	8.91	503	0.63	-64	133	6.03
1330	100	17.95	8.92	507	0.56	-65	174	6.16
1333	100	17.86	8.93	507	0.53	-66	208	6.29
1336	100	17.86	8.95	506	0.46	-68	266	6.41
1339	100	17.83	8.96	513	0.36	-69	302	6.53
1342	100	17.78	8.98	513	0.29	-70	323	6.63
1345	100	17.70	8.99	516	0.25	-71	339	6.70
1348	100	17.66	9.01	521	0.23	-72	378	6.78
1351	100	17.71	9.02	514	0.22	-72	379	6.87
1354	100	17.68	9.03	519	0.19	-73	409	6.94

Observations: _____

Sample ID: MW16-CW-2D Sample Date: 9-24-01 Sample Time: 15:25

Analytes: VOC, DOC

Well Purge/Sampling Form

Purge Data MW16-CW-2D

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	±0.5°C	±0.1	±3%	±0.2	±10	≤ 50	<0.01 Ft Increase
1357	100	17.68	9.04	521	0.17	-73	397	7.02
1400	100	17.67	9.06	519	0.17	-74	400	7.09
1403	100	17.63	9.07	520	0.17	-74	402	7.14
1406	100	17.65	9.08	525	0.16	-75	426	7.20
1409	100	17.68	9.09	527	0.13	-75	429	7.27
1412	100	17.69	9.10	524	0.13	-75	396	7.37
1415	100	17.70	9.11	524	0.13	-75	360	7.42
1418	100	17.69	9.12	531	0.12	-75	364	7.56
1421	100	17.69	9.13	527	0.11	-76	332	7.64
1424	100	17.68	9.14	528	0.10	-76	293	7.71
1427	100	17.63	9.14	530	0.11	-76	262	7.80
1430	100	17.61	9.15	526	0.10	-76	250	7.87
1433	100	17.58	9.16	527	0.10	-76	232	7.93
1436	100	17.57	9.17	524	0.10	-76	242	7.97
1439	100	17.54	9.17	524	0.10	-75	239	8.06
1442	100	17.61	9.18	522	0.09	-75	230	8.11
1445	100	17.60	9.19	518	0.10	-75	244	8.15
1448	100	17.58	9.19	521	0.09	-75	241	8.20
1451	50	17.47	9.19	519	0.08	-75	445	8.12
1454	50	18.54	9.20	523	0.08	-76	209	7.97
1457	50	18.95	9.20	523	0.08	-76	194	7.89
1500	50	19.17	9.21	518	0.09	-76	198	7.70
1503	50	19.15	9.22	525	0.08	-76	122	7.55
1506	50	19.17	9.22	525	0.08	-76	91.4	7.43
1509	50	19.35	9.22	529	0.08	-74	55.2	7.39
1512	50	19.44	9.23	530	0.09	-74	38.3	7.30
~~1515~~	~~50~~	~~19.29~~	~~9.23~~	~~530~~	~~0.10~~	~~-73~~		~~7.24~~
~~1518~~	~~50~~	RSW						

Well Purge/Sampling Form

Well Data

Project: LCHAP 775871

Date: 9-24-01

Sampler(s): Brandy S. Smallwood

PID Reading (ppm): —

Purge/Sample Method: Low Flow

Field Alkalinity Results: —

Field Fe II Results: Fe+2 / 0.15 / Total Fe 0.18

Well Number: MW16-CW-2S

L = Total Casing and Screen Length (ft): ~~0.00~~

W = Depth to Water (ft BTOC): 0.00 / 0.00 Top = 9.6

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: 3.6 L ~ 8.2 EV

see PW-15 for Volume Calc.

3EV = 1323 ml

Well Volume Calculation:

~~V = 0.0408(D)² X (L – W)~~

~~V = 0.0408( )² X ( ) = _____ gallons~~

Purge Data

Starting WL: 0.00

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
10.59	100	18.05	8.77	494	1.37	61	2.74	0.00
1057	100	18.55	8.72	490	0.49	69	3.27	0.00
1100	100	18.64	8.70	487	0.27	74	1.35	0.00
1103	100	18.60	8.69	487	0.20	76	2.37	0.00
1106	100	18.68	8.68	486	0.18	77	0.70	0.00
1109	100	18.63	8.68	485	0.17	77	0.72	0.00
1112	100	18.65	8.68	485	0.15	78	0.72	0.00
1115	100	18.53	8.67	486	0.15	79	2.56	0.00
1118	100	18.41	8.66	483	0.14	80	2.80	0.00
1121	100	18.36	8.66	486	0.13	81	2.18	0.00
1124	100	18.18	8.67	487	0.13	81	2.16	0.00
1127	100	18.14	8.66	487	0.11	81	2.54	0.00

Observations: Well is Flowing

Sample ID: MW16-CW-2S Sample Date: 9-24-01 Sample Time: 11:33

Analytes: VOC, DOC

Well Purge/Sampling Form

Well Data

Project: 77 LCAAP 775871 | Well Number: MW16-CW-3D

Date: 9-21-01 | L = Total Casing and Screen Length (ft): ____

Sampler(s): Brandy Sz Smallwood | W = Depth to Water (ft BTOC): 6.59' / 17.69' TOC TOP=479

PID Reading (ppm): — | D = Casing diameter (in): ____

Purge/Sample Method: Low Flow | V = Volume of Water in Casing: —

Field Alkalinity Results: — | Total Volume Purged: 10.8L ~ ~~14.5~~ 13.4 EV

Field Fe II Results: Fe+2 3.30 / Total Fe 3.28

See PW-15 for Volume Calc.

3 EV = ~~2227.9 ml~~ 2415.7 ml

Well Volume Calculation:

$V = 0.0408(D)^2 \times (L - W)$

$V = 0.0408(\ )^2 \times (\quad) =$ _____ gallons

Purge Data Starting Water level 6.59' TOC

Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
		Water Quality Parameters						
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1307	100	19.63	9.29	695	0.39	-86	12.1	7.34
1310	100	18.74	9.32	571	0.22	-94	19.6	7.59
1313	100	18.46	9.33	529	0.17	-99	17.1	7.92
1316	100	18.34	9.34	510	0.14	-102	13.1	8.26
1319	50	18.44	9.33	505	0.12	-103	11.9	8.40
1322	50	19.08	9.33	494	0.11	-105	8.76	8.58
1325	50	19.26	9.33	494	0.11	-106	7.85	8.71
1328	50	19.32	9.33	487	0.10	-107	7.20	8.91
1331	50	19.25	9.33	490	0.08	-105	7.60	9.10
1334	50	19.32	9.34	496	0.08	-103	6.69	9.25
1337	50	19.43	9.35	498	0.08	-102	5.89	9.40
1340	50	19.57	9.36	494	0.07	-104	5.94	9.55
1343	50	19.39	9.36	480	0.07	-108	5.66	9.71
1346	50	19.50	9.37	490	0.07	-107	5.93	9.91
1349	50	19.41	9.38	484	0.06	-105	6.51	10.10

Observations: ~~Well would not stabilize~~ Water level would not stabilize

Sample ID: MW16-CW-3D | Sample Date: 9-21-01 | Sample Time: 1600

Analytes: VOC, DOC

Well Purge/Sampling Form

Purge Data MW16-CW-3D

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
1352	50	19.62	9.38	491	0.06	-105	6.21	10.24
1355	50	19.52	9.39	486	0.06	-106	5.37	10.36
1358	50	19.42	9.39	491	0.06	-104	5.55	10.48
1401	50	19.50	9.39	490	0.06	-98	5.83	10.60
1404	50	19.59	9.39	491	0.05	-95	5.86	10.72
1407	50	19.72	9.40	487	0.05	-96	6.29	10.84
1410	50	19.62	9.41	487	0.06	-98	5.50	10.93
1413	50	19.71	9.41	488	0.06	-98	5.56	11.02
1416	50	19.75	9.41	487	0.06	-101	6.48	11.14
1419	50	19.60	9.41	487	0.06	-101	6.09	11.26
1422	50	19.62	9.42	488	0.05	-102	6.29	11.35
1425	50	19.73	9.42	488	0.06	-103	7.12	11.48
1428		~~18.46~~	~~9.44~~			~~-104~~		
1431	100	18.57	9.44	483	0.06	-104	6.98	11.93
1434	100	17.89	9.44	483	0.05	-102	7.10	12.18
1437	100	17.69	9.43	491	0.05	-101	7.06	12.49
1440	100	17.57	9.43	493	0.05	-102	7.53	12.76
1443	100	17.63	9.44	491	0.04	-102	7.57	13.04
1446	100	17.60	9.44	486	0.04	-102	7.99	13.64
1449	100	17.66	9.44	491	0.05	-103	4.75	13.81
1452	100	17.57	9.44	493	0.05	-103	7.51	14.03
1455	100	17.54	9.45	489	0.05	-104	4.92	14.25
1458	100	17.46	9.45	485	0.04	-104	8.01	14.49
1501	100	17.23	9.46	488	0.04	-104	8.10	14.76
1504	100	17.35	9.46	491	0.05	-103	8.40	14.93
1507	100	17.37	9.46	485	0.04	-103	8.63	15.19
1510	150	17.13	9.47	481	0.05	-104	8.68	15.46
1513	150	16.95	9.47	482	0.04	-103	9.32	15.77
1516	150	16.87	9.47	485	0.05	-103	8.93	16.07
1519	150	16.17	9.47	489	0.04	-102	9.54	16.55
1522	150	16.45	9.47	489	0.04	-102	5.23	16.96
1525	150	16.46	9.47	489	0.04	-102	9.23	17.38
1528	150	16.45	9.48	484	0.04	-102	10.26	17.84
1531	150	16.45	9.48	482	0.04	-102	5.59	18.12
1534	150	16.36	9.48	485	0.05	-102	10.52	18.49
1537	150	16.43	9.48	484	0.05	-102	10.96	18.82
1540	150	16.46	9.48	483	0.04	-102	8.19	19.05
1543	150	16.33	9.49	479	0.05	-101	10.89	19.22
1546	50	17.33	9.48	482	0.05	-102	6.60	19.10
1549	50	17.84	9.49	481	0.05	-103	7.61	18.25
1552	50	18.00	9.49	481	0.05	-103	8.68	18.75
1555								
1558								

Well Purge/Sampling Form

Well Data

Project: 775 871 LCAAP
Well Number: MW 16-CW-3S
Date: 9-24-01
L = Total Casing and Screen Length (ft):
Sampler(s): B. Woody, S. Smallwood
W = Depth to Water (ft BTOC): 7.29 / 10.45 TOP = 9.46'
PID Reading (ppm): —
D = Casing diameter (in): —
Purge/Sample Method: Low Flow
V = Volume of Water in Casing: —
Field Alkalinity Results: —
Field Fe II Results: Fe_{tot} 3.20 mg/l Fe^{+2} 2.46 mg/l
Total Volume Purged: 4.5 L ~ ~~12.1~~ 10.2 EV

See PW-1S for Volume Calc.

BEV = ~~1111.9 ml~~ 1319.6 ml

Well Volume Calculation:
$V = 0.0408(D)^2 \times (L - W)$
$V = 0.0408(\ )^2 \times (\quad) =$ _____ gallons

Purge Data Starting WL = 7.29' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
0923	100	17.67	8.45	1490	0.94	42	0.20	8.42
0926	100	17.93	8.54	1480	0.44	27	1.62	8.59
0929	100	17.93	8.57	1480	0.33	17	3.74	8.69
0932	100	17.99	8.59	1480	0.28	13	0.84	8.78
0935	100	18.10	8.59	1470	0.25	8	3.34	8.90
0938		~~18.18~~ ss	~~8.56~~ ss	~~1480~~ ss	~~0.27~~ ss	~~8~~ ss		~~9.55~~
0941	100	18.18	8.56	1480	0.27	8	3.52	9.09
0944	100	18.23	8.55	1500	0.27	8	0.92	9.25
0947	100	18.23	8.56	1520	0.27	8	0.99	9.39
0950	100	18.14	8.56	1530	0.25	9	3.34	9.50
0953	100	18.16	8.58	1540	0.23	9	0.98	9.58
0956	100	18.24	8.58	1540	0.22	9	~~3.6~~ 2.63	9.70
0959	50	18.33	8.61	1540	0.17	9	0.69	9.80
1002	50	18.41	8.62	1540	0.18	9	0.65	9.86
1005	50	18.62	8.63	1540	0.18	11	2.74	9.92

Observations:

Sample ID: MW16-CW-3S
Sample Date: 9-24-01
Sample Time: 1020

Analytes: VOC / DOC

Well Purge/Sampling Form

Purge Data MW16-CW-35

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤ 50	<0.01 Ft Increase
1008	~~150~~ 50	18.85	8.63	1540	0.17	12	0.75	9.95
1011	50	18.74	8.63	1540	0.17	12	2.18	10.01
1014	50	18.47	8.63	1540	0.17	14	2.10	10.05
1017	50	18.24	8.63	1530	0.16	14	2.70	10.09
1020	50	18.28	8.64	1520	0.16	16	0.91	10.19

Well Purge/Sampling Form

Well Data

Project: LCAAP 1775871

Date: 9-26-01

Sampler(s): B. Woody, S Smallwood

PID Reading (ppm): ~

Purge/Sample Method: Low Flow

Field Alkalinity Results: Acid 0 / 0 total

Field Fe II Results: Fe+2 3.30 / Total Fe 3.30

Well Number: MW16-CW-4D

L = Total Casing and Screen Length (ft): —

W = Depth to Water (ft BTOC): 2.18' / 3.47'

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: 4.3 L ~ ~~17.1 EV~~ 16.6

See PW-15 for Volume Calculation

3 EV = ~~1975.4 ml~~ 2037.5 ml

~~Well Volume Calculation:~~

~~$V = 0.0408(D)^2 X (L - W)$~~

~~$V = 0.0408(\ )^2 X (\ \ \ ) =$ _____ gallons~~

Purge Data

Starting WL = 2.18' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
0804	100	16.91	9.13	452	1.43	75	15.7	2.76
0807	100	16.77	9.12	453	1.07	45	16.1	2.82
0810	100	16.90	9.12	452	0.87	32	13.0	2.93
0813	100	16.97	9.12	457	0.71	22	11.3	2.97
0816	100	17.01	9.12	452	0.61	16	10.8	3.04
0819	100	17.01	9.12	455	0.58	11	8.47	3.11
0822	100	17.02	9.11	454	0.48	8	8.10	3.15
0825	100	17.01	9.11	455	0.44	7	7.05	3.20
0828	100	17.03	9.11	453	0.43	3	4.80	3.25
0831	100	17.11	9.11	454	0.41	1	5.00	3.29
0834	100	17.17	9.10	454	0.34	-1	4.97	3.34
0837	100	17.16	9.10	454	0.29	-2	4.03	3.36
0840	100	17.20	9.10	456	0.27	-4	4.65	3.40
0843	100	17.20	9.10	457	0.24	-5	5.06	3.44
0846	100	17.20	9.10	456	0.23	-6	4.55	3.46

Observations: _____

Sample ID: MW16-CW-4D Sample Date: 9-26-01 Sample Time: 0936

Analytes: VOC, DOC, Alkalinity, Major Cations & Anions

Well Purge/Sampling Form

Purge Data MW16-CW-4D

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
0849	150	17.08	9.10	457	0.23	-7	3.71	3.60
0852	150	16.90	9.10	457	0.21	-8	3.85	3.71
0855	150	16.62	9.10	460	0.20	-10	3.57	3.80
0858	150	16.61	9.10	456	0.19	-10	4.35	3.90
0901	150	16.61	9.10	456	0.19	-11	4.40	3.96
0904	150	16.60	9.11	454	0.17	-12	3.47	4.02
0907	150	16.65	9.11	455	0.17	-12	2.97	4.09
0910	150	16.58	9.11	454	0.16	-13	2.98	4.15
0913	150	16.58	9.11	456	0.15	-13	2.28	4.20
0916	150	16.70	9.10	456	0.15	-14	0.53	4.23
0919	150	16.76	9.10	458	0.13	-14	1.86	4.26
0922	150	16.75	9.11	456	0.14	-15	1.85	4.29
0925	50	17.03	9.11	454	0.13	-15	1.37	4.12
0928	50	17.43	9.11	455	0.14	-16	1.25	4.00
0931	50	17.49	9.11	454	0.14	-17	3.85	3.85

Well Purge/Sampling Form

Well Data

Project: LCAAP 775871
Well Number: MW16-CW-4S
Date: 9-25-01
L = Total Casing and Screen Length (ft): —
Sampler(s): R Moody, S Smallwood
W = Depth to Water (ft BTOC): 0.00 / 0.00 ToP = 9.83
PID Reading (ppm): —
D = Casing diameter (in): —
Purge/Sample Method: Low Flow
V = Volume of Water in Casing: —
Field Alkalinity Results: 0 (As CaCO3) / 0 (Total)
Field Fe II Results: Fe12 1.59 / Total Fe 1.28
Total Volume Purged: 3.6 L = ~ 8.1 EV

See MW16-PW-1S for Volume Calc.

3 EV = 1330.2 ml

~~Well Volume Calculation:~~
~~$V = 0.0408(D)^2 X (L - W)$~~
~~$V = 0.0408(\ )^2 X (\ \ \ ) =$ _____ gallons~~

Purge Data

STARTING DEPTH " 0.00

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1554	100	20.61	9.40	580	0.86	-16	86.4	0.00
1557	100	20.61	9.17	574	0.49	-15	91.8	0.00
1600	100	20.65	9.03	571	0.36	-14	57.8	0.10
1603	100	20.62	8.94	570	0.36	-13	20.7	0.10
1606	100	20.60	8.89	571	0.26	-11	8.91	0.10
1609	100	20.55	8.85	569	0.29	-9	4.99	0.10
1612	100	20.56	8.84	570	0.28	-8	3.66	0.10
1615	100	20.55	8.82	567	0.23	-8	3.18	0.10
1618	100	20.49	8.81	567	0.19	-7	2.49	0.10
1621	100	20.47	8.81	575	0.25	-6	2.05	0.10
1624	100	20.50	8.80	571	0.19	-6	2.01	0.10
1627	100	20.47	8.80	575	0.19	-6	1.88	0.10

Observations: _____

Sample ID: MW16-CW-4S
Sample Date: 9-25-01
Sample Time: 1633

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Well Data

Project: LCAAP 77581 | Well Number: MW 16 - CW - 5D

Date: 9-25-01 | L = Total Casing and Screen Length (ft): —

Sampler(s): B. Veoody, S. Smallwood | W = Depth to Water (ft BTOC): 4.90' / 5.05

PID Reading (ppm): — | D = Casing diameter (in): —

Purge/Sample Method: Low Flow | V = Volume of Water in Casing: —

Field Alkalinity Results: ~~Phen~~ As CaCO3 0.0 mg/l total 0.0 mg/l 5.7

Field Fe II Results: Fe^{+2} 3.30 mg/l 2.78 tot | Total Volume Purged: 3.9L ~ ~~6.2~~ EV

See PW-15 for Volume Calc.

3 EV = ~~1899.3 ml~~ 2038.9 ml

Well Volume Calculation:

~~$V = 0.0408(D)^2 X (L - W)$~~

~~$V = 0.0408(\ )^2 X (\quad) =$~~ _____ gallons

Purge Data Starting WL = 4.90' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1324	100	19.31	9.26	352	2.66	5	36.3	5.07
1327	100	18.76	9.29	357	1.77	-27	41.3	5.12
1330	100	18.76	9.34	354	1.31	-40	38.2	5.14
1333	100	18.98	9.41	344	1.05	-53	38.8	5.20
1336	100	18.91	9.45	336	0.78	-62	37.5	5.21
1339	100	18.97	9.48	336	0.75	-66	38.5	5.23
1342	100	18.77	9.51	331	0.58	-72	45.4	5.25
1345	100	18.67	9.53	328	0.77	-75	43.3	5.30
1348	100	18.74	9.55	323	0.76	-80	41.9	5.30
1351	100	18.68	9.57	325	0.72	-84	41.4	5.32
1354	100	18.69	9.59	320	0.54	-86	35.0	5.32
1357	100	18.62	9.60	322	0.44	-89	37.0	5.32
1400	100	18.58	9.61	319	0.51	-91	36.8	5.32

Observations: _____

Sample ID: MW16-CW-5D | Sample Date: 9-25-01 | Sample Time: 14:05

Analytes: VOC, DOC, Alkalinity, Major Cations + Anions

Well Purge/Sampling Form

Well Data

Project: LCAAP 775871
Well Number: MW16-CW-5S
Date: 9-25-01
L = Total Casing and Screen Length (ft): —
Sampler(s): B. Woody S. Smallwood
W = Depth to Water (ft BTOC): 1.01' / 0.91' TOC OP Top = 9.5'
PID Reading (ppm): —
D = Casing diameter (in): —
Purge/Sample Method: Low Flow
V = Volume of Water in Casing: —
Field Alkalinity Results: $ASCO_3$ 9.3 / TOTAL 10.9
Field Fe II Results: Fe^{+2} .05 / TOTAL .20
Total Volume Purged: 3.6L ~ ~~8.3~~ 8.2 EV

Volume Calculation See MW-15

3 EV = ~~1294.5 ml~~ 1323.3 ml

~~Well Volume Calculation:~~
~~$V = 0.0408(D)^2 X (L - W)$~~
~~$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons~~

Purge Data

Starting WL = 1.01' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1442	100	21.77	11.63	211	0.73	-117	11.8	1.07
1445	100	21.93	12.10	214	0.55	-156	5.50	1.07
1448	100	21.87	12.24	213	0.38	-182	5.43	1.07
1451	100	21.93	12.33	212	0.30	-201	6.75	1.07
1454	100	21.97	12.37	213	0.25	-216	8.54	1.07
1457	100	21.95	12.39	216	0.26	-225	9.17	1.07
1500	100	21.93	12.40	219	0.25	-232	8.71	1.07
1503	100	22.03	12.41	224	0.20	-236	8.00	1.07
1506	100	22.05	12.42	226	0.18	-240	7.61	1.07
1509	100	22.03	12.43	226	0.16	-243	7.17	1.07
1512	100	22.13	12.43	231	0.18	-245	6.86	1.07
1515	100	22.10	12.44	225	0.16	-247	6.21	1.07

Observations: Water level Rising After Sampling

Sample ID: MW16-CW-5S Sample Date: 9-25-01 Sample Time: 15:22

Analytes: VOC, DOC, Alkalinity, Major Cations + Anions

Well Purge/Sampling Form

Well Data

Project: LCAAP 1775871

Well Number: MW16-CW-6B

Date: 9-27-01

L = Total Casing and Screen Length (ft): —

Sampler(s): Bloody S. Smallwood

W = Depth to Water (ft BTOC): 19.06 / 26.80

PID Reading (ppm): —

D = Casing diameter (in): —

Purge/Sample Method: Low Flow

V = Volume of Water in Casing: —

Field Alkalinity Results: As CaCO3 0/ 27.0 total

Field Fe II Results: Fe+2 0.20/ Total Fe 0.49

Total Volume Purged: 6.8L ~ ~~10.+~~ 8.0 EV

See PW-15 for Volume Calc.

3 EV = ~~2000.5 ml~~ 2543.7ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

STARTING DEPTH 19.06

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1330	100	18.76	9.42	680	5.27	86	7.94	19.94
1333	100	17.92	9.43	670	3.32	38	25.5	20.44
1336	100	17.54	9.47	672	2.44	14	23.7	20.85
1339	100	17.43	9.50	675	3.95	5	17.5	21.21
1342	100	17.52	9.53	676	1.63	-3	15.7	21.67
1345	100	17.30	9.55	670	1.18	-9	16.9	22.12
1348	100	17.28	9.57	670	1.08	-12	19.3	22.45
1351	100	17.22	9.58	683	1.05	-14	21.2	22.69
1354	100	17.30	9.59	679	0.92	-17	22.7	22.95
1357	100	17.20	9.61	687	0.84	-19	21.7	23.21
1400	100	17.28	9.63	679	0.73	-21	22.4	23.45
1403	100	17.26	9.64	677	0.56	-23	24.9	23.80
1406	100	17.26	9.65	675	0.61	-24	25.7	24.03
1409	100	17.30	9.67	671	0.52	-26	26.9	24.36
1412	100	17.26	9.68	671	0.52	-27	25.8	24.51

Observations: _____

Sample ID: MW16-CW-6B

Sample Date: 9-27-01

Sample Time: 1503

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Purge Data MW16-CW-16B

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	±0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
1415	150	17.13	9.69	683	0.49	-27	26.3	24.83
1418	150	16.80	9.70	672	0.46	-28	28.1	25.18
1421	150	16.73	9.71	680	0.42	-28	20.1	25.51
1424	150	16.68	9.71	672	0.38	-28	27.2	25.89
1427	150	16.66	9.72	670	0.38	-28	24.9	26.12
1430	150	16.69	9.73	672	0.35	-29	24.9	26.41
1433	150	16.72	9.74	670	0.34	-29	26.1	26.70
1436	150	16.58	9.74	670	0.34	-29	26.6	26.92
1439	150	16.71	9.75	678	0.36	-30	28.8	27.21
1442	150	16.72	9.76	670	0.33	-30	27.9	27.48
1445	50	16.63	9.76	670	0.29	-30	30.7	27.52
1448	50	18.57	9.76	673	0.25	-32	28.5	27.40
1451	50	19.32	9.77	667	0.31	-33	28.3	27.30
1454	50	19.76	9.77	660	0.30	-33	28.2	27.15
1457	50	19.80	9.78	667	0.28	-34	24.2	27.03

Well Purge/Sampling Form

Well Data

Project: LCAAP 1775971
Well Number: MW16-CW-6D
Date: 9-27-01
L = Total Casing and Screen Length (ft):
Sampler(s): B. Moody S. Smallwood
W = Depth to Water (ft BTOC): 2.70 / 3.99
PID Reading (ppm):
D = Casing diameter (in):
Purge/Sample Method: Low Flow
V = Volume of Water in Casing:
Field Alkalinity Results: CaCO3 0 / 36.3 CaCO3 total
Field Fe II Results: Fe+2 1.40 / Total Fe 1.94
Total Volume Purged: 5.4 L ~ ~~8.8~~ 8.5 EV

See PW-1S for Volume Calc.

3 EV = ~~1839.2 ml~~ 1916.12 ml

~~Well Volume Calculation:~~
~~$V = 0.0408(D)^2 X (L - W)$~~
~~$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons~~

Purge Data

Starting Water level 2.70' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1015	100	18.54	9.99	460	2.31	18	20.9	3.07
1018	100	18.21	9.71	449	1.17	1	49.8	3.20
1021	100	18.09	9.61	447	0.78	-7	52.7	3.29
1024	100	18.03	9.55	450	0.57	-13	41.7	3.38
1027	100	18.05	9.50	451	0.51	-18	34.6	3.49
1030	100	17.91	9.49	446	0.42	-20	29.2	3.58
1033	100	17.95	9.48	447	0.36	-22	23.7	3.59
1036	100	17.89	9.47	451	0.35	-23	23.6	3.63
1039	100	17.86	9.46	452	0.30	-24	25.1	3.71
1042	100	17.86	9.45	450	0.30	-25	24.8	3.79
1045	100	17.93	9.46	450	0.25	-26	23.6	3.81
1048	100	17.85	9.45	451	0.23	-26	24.2	3.81
1051	100	17.93	9.45	453	0.21	-27	27.2	3.85
1054	150	17.80	9.45	455	0.25	-27	23.9	3.98
1057	150	17.45	9.45	453	0.24	-27	25.3	4.05

Observations:

Sample ID: MW16-CW-6D
Sample Date: 9-27-01
Sample Time: 9:27

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Purge Data MW16-CW-(e1) **Page** 2 **of** 2

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
1100	150	17.47	9.45	461	0.24	-28	25.6	4.10
1103	150	17.42	9.45	457	0.25	-28	26.4	4.14
1106	150	17.41	9.45	458	0.21	-28	27.5	4.20
1109	150	17.46	9.45	461	0.19	-29	30.4	4.24
1112	150	17.47	9.45	461	0.21	-29	33.4	4.29
1115	50	18.25	9.45	459	0.16	-30	32.6	4.17
1118	50	18.45	9.45	462	0.17	-31	32.6	4.10
1121	50	18.67	9.45	460	0.18	-31	29.4	4.08

Well Purge/Sampling Form

Well Data

Project: LCAAP / 775871

Date: 9-27-01

Sampler(s): B. Wendy S. Smallwood

PID Reading (ppm): —

Purge/Sample Method: Low Flow

Field Alkalinity Results: CaCO3 0.00 / 27.5 total

Field Fe II Results: Fe+2 0.00 / Total Fe 0.19

Well Number: MW16-CW-6S

L = Total Casing and Screen Length (ft): —

W = Depth to Water (ft BTOC): 0.00 / 0.00

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: 3.6L ~ 8.1 EV

See PW-1S for Volume Calc.

3 EV = 1329.6 ml

~~Well Volume Calculation:~~

~~$V = 0.0408(D)^2 X (L - W)$~~

~~$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons~~

Purge Data

Starting WL = 0.00' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	±0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1530	100	21.16	9.33	509	4.50	21	8.86	0.00
1533	100	20.26	9.08	515	2.55	39	4.08	0.00
1536	100	20.25	9.00	523	1.40	49	3.08	0.00
1539	100	20.23	8.95	521	1.11	55	2.38	0.00
1542	100	20.31	8.95	525	0.74	58	1.71	0.00
1545	100	20.31	8.94	527	0.60	60	1.24	0.00
1548	100	20.32	8.94	526	0.49	60	0.90	0.00
1551	100	20.44	8.94	527	0.53	53	0.60	0.00
1554	100	20.41	8.94	527	0.57	44	0.46	0.00
1557	100	20.37	8.94	523	0.36	34	0.35	0.00
1600	100	20.36	8.94	522	0.43	30	0.69	0.00
1603	100	20.38	8.95	526	0.29	26	0.60	0.00

Observations: Well is flowing

Sample ID: MW16-CW-6S
MW16-CW-106S (Duplicate)

Sample Date: 9-27-01

Sample Time: 1610

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions, ~~Filtered~~ Collect Duplicate Sample MW16-CW-106S for VOC. Time is 1615

Well Purge/Sampling Form

Well Data

Project: LCAAP 775871
Well Number: MW16 - CW-7B
Date: 9-26-01
L = Total Casing and Screen Length (ft): —
Sampler(s): Bloody S. Smallwood
W = Depth to Water (ft BTOC): 18.92 / 43.96 TOP 52.31
PID Reading (ppm): —
D = Casing diameter (in): —
Purge/Sample Method: Low Flow
V = Volume of Water in Casing: —
Field Alkalinity Results: 0 / 50.0 (As CaCO3) total
Field Fe II Results: FE+2 0.48 / TOTAL 0.30
Total Volume Purged: 32.4L ~ ~~48.6~~ EV 38.3 ml

~~Pump Volume 375 ml~~
Line Volume
See PW-15 for Volume Calc.
3 EV = ~~2001.6 ml~~ 2540.8 ml

Well Volume Calculation:
$V = 0.0408(D)^2 X (L - W)$
$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

Starting Water level = 18.92' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1409	200	15.80	9.85	451	2.60	120	797.2	20.91
1412	200	15.51	9.88	451	1.49	114	423	22.02
1415	200	15.46	9.89	447	1.68	107	176	23.03
1418	200	15.38	9.89	440	1.33	102	93.3	23.98
1421	200	15.35	9.89	434	0.96	97	75.0	24.71
1424	200	15.35	9.89	434	1.02	93	75.6	25.55
1427	200	15.40	9.90	435	0.63	87	76.1	26.36
1430	200	15.40	9.91	439	0.57	83	69.5	26.80
1433	200	15.53	9.91	439	0.56	76	580	27.43
1436	200	15.54	9.93	436	0.51	64	973	28.03
1439	200	15.47	9.94	437	0.47	52	794	28.54
1442	200	15.46	9.96	439	0.38	43	668	29.05
1445	200	15.40	9.97	437	0.46	33	573	29.65
1448	200	15.34	9.98	437	0.48	28	490	30.21
1451	200	15.34	9.99	436	0.51	22	443	30.76

Observations: Turbidity problem

Sample ID: MW16-CW-7B
MW16-CW-7 MS/MSD for AML
Sample Date: 9-26-01
Sample Time: 1655

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Purge Data MW16-CW-7B

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤ 50	<0.01 Ft Increase
1454	200	15.34	10.00	439	0.57	19	404	31.35
1457	200	15.30	10.01	439	0.55	16	343	31.85
1500	200	15.35	10.02	436	0.51	13	305	32.35
1503	200	15.27	10.04	438	0.50	11	299	32.85
1506	200	15.27	10.05	438	0.51	9	299	33.30
1509	200	15.26	10.06	441	0.61	7	257	33.85
1512	200	15.26	10.07	437	0.53	5	245	34.32
1515	200	15.23	10.08	440	0.55	4	225	34.78
1518	200	15.17	10.09	438	0.50	3	232	35.22
1521	200	15.15	10.09	441	0.53	2	222	35.61
1524	200	15.16	10.10	441	0.46	1	216	36.02
1527	200	15.20	10.11	439	0.52	-1	207	36.55
1530	200	15.17	10.12	440	0.48	-2	200	36.91
1533	200	15.14	10.12	441	0.47	-3	190	37.32
1536	200	15.10	10.13	442	0.46	-4	181	37.78
1539	200	15.18	10.14	441	0.45	-5	173	38.17
1542	200	15.17	10.14	443	0.48	-6	159	38.50
1545	200	15.10	10.16	436	0.48	-6	150	38.92
1548	200	15.17	10.16	435	0.48	-6	155	39.20
1551	200	15.17	10.17	428	0.42	-7	135	39.72
1554	200	15.13	10.18	424	0.49	-10	139	39.94
1557	200	15.09	10.18	420	0.48	-12	138	40.30
1600	200	15.06	10.19	411	0.42	-14	145	40.62
1603	200	15.06	10.20	404	0.43	-16	164	40.97
1606	200	15.06	10.21	400	0.45	-18	164	41.26
1609	200	15.06	10.22	397	0.47	-21	146	41.66
1612	200	15.08	10.24	393	0.47	-22	154	41.89
1615	200	15.05	10.25	394	0.45	-25	136	42.19
1618	200	15.03	10.26	397	0.50	-26	142	42.49
1621	200	15.01	10.29	394	0.45	-28	123	42.74
1624	200	14.99	10.32	395	0.48	-30	105.5	43.06
1627	200	14.99	10.34	399	0.52	-31	105.1	43.31
1630	200	14.99	10.37	399	0.48	-32	107.6	43.56
1633	200	14.95	10.40	399	0.43	-33	90.8	43.84
1636	200	14.93	10.43	404	0.44	-34	68.6	44.06
1639	200	14.95	10.46	408	0.47	-35	56.1	44.40
1642	200	14.92	10.49	414	0.45	-36	49.9	44.59
1645	200	14.91	10.51	421	0.50	-36	40.0	44.80
1648	200	15.38	10.51	418	0.54	-36	44.3	44.61
1651	100	15.41	10.54	422	0.49	-37	44.8	44.41
1654								
1657								
1700								

Well Purge/Sampling Form

Well Data

Project: 775871 / LCAAP

Well Number: MW16-CW-7D

Date: 9-26-01

L = Total Casing and Screen Length (ft):

Sampler(s): B. Woody S. Smallwood

W = Depth to Water (ft BTOC): 6.22' / 6.67 TOP = 32.4'

PID Reading (ppm): —

D = Casing diameter (in): —

Purge/Sample Method: Low Flow

V = Volume of Water in Casing: —

Field Alkalinity Results: ~~total 270m 22 mg/l~~ As CaCO3 0mg/l 21.3 ~~36.2~~ 32.9

Field Fe II Results: Fe^{+2} = 1.49 mg/l Fe_{tot} 1.33 mg/l Total Volume Purged: ~~7.7~~ L ~ ~~13.1~~ EV

See PW-15 for Volume Calc.

3 EV = ~~1767.1 ml~~ 1944.3 ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

Starting WL = 6.22' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1025	100	18.50	9.17	508	1.44	22	398	6.35
1028	100	17.91	9.15	539	0.88	14	890	6.36
1031	100	17.66	9.16	546	0.57	7	1356	6.36
1034		~~16.35~~ 160				~~7~~ 160		
1037	200	16.35	9.16	551	0.46	1	364	6.50
1040	200	16.44	9.18	531	0.38	-4	365	6.57
1043	200	16.48	9.20	515	0.33	-7	318	6.61
1046	200	16.49	9.23	510	0.29	-8	258	6.63
1049	200	16.54	9.23	504	0.27	-9	238	6.64
1052	200	16.54	9.24	497	0.22	-10	203	6.64
1055	200	16.57	9.25	492	0.21	-11	181	6.64
1058	200	16.58	9.25	486	0.20	-13	166	6.66
1101	200	16.59	9.26	487	0.17	-14	145	6.68
1104	200	16.99	9.27	473	0.17	-15	139	6.70
1107	200	16.35	9.27	467	0.13	-17	124	6.75

Observations: Turbidity Problem

Sample ID: MW16-CW-7D Sample Date: 9-26-01 Sample Time: 12:24

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Purge Data MW 16-CW-7D

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
1110	200	16.41	9.28	459	0.14	-18	119	6.75
1113	200	16.37	9.28	458	0.14	-19	117	6.75
1116	200	16.42	9.29	452	0.14	-20	108.5	6.75
1119	200	16.41	9.29	453	0.12	-20	101.6	6.75
1122	200	16.34	9.30	451	0.12	-21	93.4	6.75
1125	200	16.38	9.30	449	0.13	-22	91.3	6.75
1128	200	16.40	9.30	447	0.11	-22	87.2	6.75
1131	200	16.44	9.30	446	0.11	-22	85.0	6.75
1134	200	16.49	9.31	440	0.11	-23	86.2	6.75
1137	200	16.43	9.32	437	0.10	-24	88.0	6.78
1140	200	16.40	9.33	431	0.09	-25	90.0	6.82
1143	200	16.51	9.34	430	0.08	-25	83.7	6.82
1146	200	16.44	9.35	428	0.07	-25	83.8	6.82
1149	200	16.42	9.35	424	0.07	-25	89.6	6.82
1152	200	16.43	9.36	427	0.11	-26	83.4	6.82
1155	200	16.45	9.35	420	0.07	-26	75.3	6.82
1158	200	16.48	9.35	419	0.07	-26	70.7	6.82
1201	200	16.44	9.35	419	0.06	-26	73.2	6.84
1204	200	16.44	9.35	417	0.07	-26	66.9	6.84
1207	200	16.46	9.35	416	0.06	-27	61.0	6.87
1210	200	16.48	9.35	414	0.07	-27	62.4	6.87
1213	200	16.50	9.35	414	0.07	-27	60.4	6.87
1216	200	16.40	9.35	415	0.07	-27	45.7	6.87
1219								

Well Purge/Sampling Form

Well Data

Project: LCAAP / 775871
Well Number: MW16-CW-75
Date: 9-27-01
L = Total Casing and Screen Length (ft): —
Sampler(s): B. Wood, S. Smallwood
W = Depth to Water (ft BTOC): 5.30' / 5.41'
PID Reading (ppm): —
D = Casing diameter (in): —
Purge/Sample Method: Low Flow
V = Volume of Water in Casing: —
Field Alkalinity Results: As CaCO3 0 / 26.4 total
Field Fe II Results: Fe+2 0.03 / TOTAL Fe ~~0.03~~ 0.33
Total Volume Purged: 4.1 L ~ ~~10.5~~ 9.3 EV

See PW-1S for Volume Calc

3 EV = ~~1160.3 ml~~ ~~1311.8 ml~~ 1311.4 ml

Well Volume Calculation:
V = 0.0408(D)^2 X (L – W)
V = 0.0408( )^2 X ( ) = _____ gallons

Purge Data

Starting LWL = 5.30' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
0845	100	18.53	10.59	161	2.82	77	22.9	6.06
0848	100	18.78	11.25	159	2.23	58	19.2	6.44
0851	100	18.66	11.41	160	1.69	44	14.7	6.66
0854	100	18.58	11.48	159	1.68	35	12.2	6.89
0857	100	18.54	11.51	159	1.28	24	14.2	6.96
0900	100	18.46	11.53	159	1.07	20	9.62	7.14
0903	100	18.40	11.54	163	0.96	13	10.90	7.20
0906	100	18.34	11.55	158	0.88	6	7.58	7.31
0909	100	18.35	11.55	159	0.77	0	6.60	7.50
0912	100	18.33	11.56	158	0.77	-5	5.15	7.57
0915	100	18.33	11.56	158	0.63	-9	5.13	7.63
0918	100	18.32	11.56	158	0.57	-13	4.66	7.70
0921	50	18.27	11.55	157	0.52	-17	4.10	7.62
0924	50	18.35	11.54	157	0.49	-19	4.10	7.58
0927	50	18.76	11.53	157	0.43	-23	4.18	7.50

Observations: _____

Sample ID: MW16-CW-75 Sample Date: 9-27-01 Sample Time: 0931
MW16-CW-1075 (duplicate) 0935

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions
MW16-CW-1075 VOC

Well Purge/Sampling Form

Well Data

Project: LCAAP 775871

Date: 9-28-01

Sampler(s): J. KAUFFMAN, S. SMALLWOOD

PID Reading (ppm): —

Purge/Sample Method: LOW FLOW

Field Alkalinity Results: —

Field Fe II Results: FE2 0.00 / TOTAL FE 0.71

Well Number: MW16-CW-8B

L = Total Casing and Screen Length (ft): —

W = Depth to Water (ft BTOC): 5.82 / 7.85 TOP = 28.0

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: 54L ~ ~~9.6~~ 8.8 EV

See MW-15 for Volume Calc.

3 EV = ~~1683.3 ml~~ 1849.14 ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

STARTING DEPTH 5.82

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
0821	~~100~~ 108	16.02	9.75	347	2.28	-30	29.2	6.68
0824	100	16.05	9.79	338	1.91	-40	22.4	6.73
0827	100	16.08	9.83	329	1.39	-48	15.7	6.89
0830	100	15.99	9.86	327	1.21	-53	10.03	6.94
0833	100	15.94	9.87	326	1.04	-56	6.37	6.99
0836	100	16.02	9.89	326	0.87	-60	7.21	7.04
0839	100	16.00	9.90	324	0.77	-62	7.07	7.11
0842	100	16.00	9.91	325	0.68	-63	8.26	7.21
0845	100	15.93	9.92	322	0.57	-66	8.01	7.32
0848	100	16.01	9.93	321	0.48	-68	6.64	7.38
0851	100	16.04	9.94	321	0.42	-69	7.72	7.45
0854	100	16.01	9.94	323	0.38	-70	7.16	7.51
0857	150	15.82	9.95	325	0.34	-72	10.68	7.72
0900	150	15.80	9.95	321	0.29	-73	8.64	7.83
0903	150	15.83	9.96	322	0.26	-74	8.51	7.96

Observations: _____

Sample ID: MW16-CW-8D Sample Date: 9-28-01 Sample Time: 0940

Analytes: VOC, DOC

Well Purge/Sampling Form

Purge Data MW16-CW-9D

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
0906	150	15.80	9.96	322	0.24	-74	5.42	8.07
0909		~~15.89~~	~~9.94~~	~~334~~	~~0.20~~	~~-75~~		8
0912								
0915	150	15.89	9.94	334	0.20	-75	13.4	8.34
0918	150	15.80	9.95	326	0.19	-75	14.1	8.44
0921	150	15.77	9.95	333	0.17	-76	13.6	8.53
0924	50	15.80	9.95	328	0.16	-76	10.35	8.41
0927	50	16.51	9.95	328	0.16	-76	9.61	8.30
0930	50	17.00	9.95	330	0.18	-76	7.44	8.22
0933	50	17.14	9.95	335	0.17	-76	9.54	8.14
0936	50	17.21	9.95	335	0.17	-75	7.58	8.10

Well Purge/Sampling Form

Well Data

Project: ICAAP 775871

Date: 9-28-01

Sampler(s): B. Woody, S Smallwood

PID Reading (ppm): —

Purge/Sample Method: Low Flow

Field Alkalinity Results: HA

Field Fe II Results: Fe+2 1.0 / Total Fe 1.40

Well Number: MW16 - CW - 8S

L = Total Casing and Screen Length (ft): —

W = Depth to Water (ft BTOC): 8.58'/9.70' TOP= 10.15

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: 4.91 ~ ~~13.6~~ 11.1 EV

See PW-15 for Volume Calculation

EV = ~~1094.8 ml~~ 1339.28 ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

STARTING DEPTH 8.58

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1036	100	20.88	9.62	319	1.71	-28	20.6	8.89
1039								
1042	100	20.00	9.37	343	0.76	-25	41.0	9.20
1045	100	20.00	9.34	348	0.59	-28	46.8	9.30
1048	100	20.03	9.32	345	0.45	-31	43.7	9.42
1051	100	20.02	9.32	346	0.42	-33	41.8	9.56
1054	100	20.09	9.32	350	0.40	-34	37.9	9.61
1057	100	20.19	9.32	349	0.32	-35	31.7	9.69
1100	100	20.26	9.33	355	0.27	-36	26.8	9.73
1103	100	20.29	9.33	362	0.27	-37	23.8	9.76
1106	100	20.22	9.35	365	0.24	-39	19.4	9.82
1109	100	20.27	9.36	363	0.22	-40	17.5	9.87
1112	150	20.00	9.37	365	0.22	-41	16.5	10.01
1115	150	19.85	9.38	359	0.21	-41	15.6	10.10
1118	150	19.88	9.39	356	0.20	-43	13.2	10.19

Observations: Water level was slow to stabilize.

Sample ID: MW16-CW-8S Sample Date: 9-28-01 Sample Time: 11:40

Analytes: VOC / DOC

Well Purge/Sampling Form

Purge Data MW16-CW-GS

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
11.21	150	19.92	9.41	347	0.22	-44	11.5	10.30
1124	150	19.89	9.42	339	0.22	-45	10.91	10.39
1127	150	19.91	9.43	329	0.21	-45	11.2	10.48
11.30	150	19.96	9.44	317	0.20	-45	11.4	10.55
1133	50	20.67	9.44	311	0.18	-45	13.8	10.37
1136	50	21.33	9.45	306	0.18	-45	13.6	10.28
1139	50	21.45	9.45	302	0.18	-44	16.1	10.20
1142	50	21.50	9.45	299	0.21	-42	15.9	10.11

Well Purge/Sampling Form

Well Data

Project: LCAAP / ~~MW~~ 775871 Well Number: MW16-CW-9D

Date: 9-28-01 L = Total Casing and Screen Length (ft): —

Sampler(s): B Woody S Smallwood W = Depth to Water (ft BTOC): 8.75 / 8.95 TOP = 3340

PID Reading (ppm): — D = Casing diameter (in): —

Purge/Sample Method: Low Flow V = Volume of Water in Casing: —

Field Alkalinity Results: NA 7.5

Field Fe II Results: Fe II 1.0 / Total Fe 1.19 Total Volume Purged: 36 L ~ 9.1 EV

See PW-1S for Volume Calc.

3EV = ~~1152.58 ml~~ 1431.9 ml

~~Well Volume Calculation:~~

~~$V = 0.0408(D)^2 X (L - W)$~~

~~$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons~~

Purge Data Starting WL = 8.75' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1333	~~100~~ 100	20.44	9.01	445	4.36	110	18.7	9.11
1336	100	19.80	8.96	454	3.03	95	25.9	9.11
1339	100	19.52	8.95	453	1.85	76	28.6	9.15
1342	100	19.46	8.94	453	1.37	66	21.7	9.15
1345	100	19.40	8.94	445	1.09	60	16.8	9.15
1348	100	19.41	8.94	442	0.92	57	21.1	9.15
1351	100	19.42	8.94	439	0.94	56	22.2	9.15
1354	100	19.38	8.94	439	0.63	54	21.2	9.15
1357	100	19.50	8.94	440	0.65	50	19.2	9.15
1400	100	19.60	8.96	439	0.58	47	18.5	9.15
1403	100	19.58	8.96	438	0.50	42	15.8	9.15
1406	100	19.49	8.97	437	0.49	40	16.3	9.15

Observations: _____

Sample ID: MW16-CW-9D Sample Date: 9-28-01 Sample Time: 1410

Analytes: VOC, DOC

Well Purge/Sampling Form

Well Data

Project: LCAAP / 775871

Well Number: MW16-CW-9S

Date: 9-28-01

L = Total Casing and Screen Length (ft):

Sampler(s): B. Woody S. Smallwood

W = Depth to Water (ft BTOC): 11.20 / 13.605 Top = 11.85

PID Reading (ppm):

D = Casing diameter (in):

Purge/Sample Method: Low Flow

V = Volume of Water in Casing:

Field Alkalinity Results:

Field Fe II Results: FE+2 0.00 / TOTAL FE 0.00 Total Volume Purged: 4.2 L ~ ~~11.8~~ 9.1 EV

See MW16-PW-1S for Volume Calc.

3 EV = ~~1069.5 ml~~ 1387.7 ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\ \ ) =$ _____ gallons

Purge Data

Starting Water Level = 11.20' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1436	100	20.87	9.15	532	2.36	88	8.37	11.75
1439	100	20.80	9.10	518	1.57	83	7.65	11.87
1442	100	20.72	9.08	499	1.63	86	6.58	12.00
1445	100	20.76	9.07	475	2.46	93	3.22	12.15
1448	100	20.77	9.07	455	3.15	100	2.08	12.32
1451	100	20.77	9.06	443	3.65	105	4.30	12.50
1454	100	20.77	9.05	437	3.66	111	4.10	12.62
1457	100	20.80	9.04	437	3.55	115	2.80	12.70
1500	100	20.77	9.03	442	3.49	118	3.19	12.83
1503	100	20.78	9.02	444	2.93	120	3.21	13.00
1506	100	20.80	9.02	447	2.46	123	3.27	13.15
1509	100	20.76	9.02	453	2.12	124	2.62	13.25
1512	100	20.73	9.03	455	1.92	126	2.98	13.37
1515	100	20.73	9.03	463	1.63	124	3.53	13.50
1518								

Observations: Stop purging before water level reaches pump at 14.10' TOC.

Sample ID: MW16-CW-9S Sample Date: 9-28-01 Sample Time: 15:20

Analytes: VOC, DOC

Well Purge/Sampling Form

Well Data

Project: LCAAP 1775871

Date: 10-01-01

Sampler(s): Bwoody S. Swallwood

PID Reading (ppm): —

Purge/Sample Method: Low Flow

Field Alkalinity Results: —

Field Fe II Results: —

Well Number: MW16-2

L = Total Casing and Screen Length (ft): 25.31

W = Depth to Water (ft BTOC): 8.78'/8.78 TOP= 20.0

D = Casing diameter (in): 4"

V = Volume of Water in Casing: —

Total Volume Purged: 5.3L ~ 11.5 EV

See Back of P2-3 for Volume Calc

3 EV = 1369.8 ml

~~Well Volume Calculation:~~

~~$V = 0.0408(D)^2 X (L - W)$~~

~~$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons~~

Purge Data

Starting WL = 8.78' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1354	100	22.41	8.20	539	2.49	7	5.59	8.78
1357	100	20.36	8.17	544	1.62	-4	4.90	8.80
1400	100	19.69	8.16	544	1.36	-9	1.48	8.84
1403	100	19.16	8.16	549	1.13	-12	4.25	8.92
1406	100	19.01	8.16	545	0.94	-16	3.99	8.98
1409	100	18.93	8.16	544	0.85	-19	1.00	9.02
1412	100	18.92	8.17	545	0.74	-21	1.11	9.05
1415	100	18.89	8.17	547	0.66	-23	0.84	9.07
1418	100	18.81	8.17	542	0.62	-24	4.66	9.09
1421	100	18.62	8.18	547	0.56	-26	3.76	9.11
1424	100	18.70	8.18	546	0.49	-27	3.65	9.14
1427	100	18.63	8.19	546	0.45	-28	4.69	9.14
1430	150	17.99	8.19	547	0.44	-29	3.99	9.18
1433	150	17.49	8.19	545	0.41	-29	0.86	9.23
1436	150	17.46	8.19	545	0.39	-30	4.19	9.28

Observations: _____

Sample ID: MW16-2 Sample Date: 10-01-01 Sample Time: 15:05

Analytes: DOC

Well Purge/Sampling Form

Purge Data MW16-2

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	±0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
1439	150	17.40	8.20	546	0.34	-30	4.33	9.31
1442	150	17.43	8.20	545	0.33	-30	0.82	9.34
1445	150	17.35	8.20	547	0.34	-31	4.04	9.36
1448	50	19.00	8.20	542	0.31	-31	1.11	9.26
1451	50	19.83	8.20	547	0.27	-33	1.30	9.19
1454	50	20.60	8.21	547	0.30	-34	0.85	9.14
1457	50	20.58	8.21	548	0.26	-34	4.39	9.09
1500	50	20.63	8.21	553	0.27	-35	4.14	9.06

Well Purge/Sampling Form

Well Data Page 1 of 1

Project: LCHAP 775871
Date: 9-21-01
Sampler(s): B. Woody S. Smallwood
PID Reading (ppm): —
Purge/Sample Method: Low Flow
Field Alkalinity Results: —
Field Fe II Results: Fe+2 0.01 / TOTAL Fe 0.16

Well Number: MW 16- PW- 10
L = Total Casing and Screen Length (ft): —
W = Depth to Water (ft BTOC): 5.55/5.63 TOP = 5.6
D = Casing diameter (in): —
V = Volume of Water in Casing: —
Total Volume Purged: ~3.6 L ~ ~~4.6~~ 4.3 EV

See PW-15 for Volume Calculation (EV)
3 equipment vol. = ~~2360 ml~~ 2526.3 ml

Well Volume Calculation:
$V = 0.0408(D)^2 X (L - W)$
$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

Starting WL = 5.55' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1019	100	19.83	11.70	388	0.97	-236	1.39	5.65
1022	100	19.96	11.95	364	0.48	-266	1.06	5.67
1025	100	19.46	11.99	356	0.33	-280	0.73	5.69
1028	100	19.37	12.00	355	0.25	-288	0.73	5.70
1031	100	19.44	12.00	355	0.20	-293	0.73	5.70
1034	100	19.47	12.00	352	0.16	-299	0.97	5.70
1037	100	19.44	12.00	353	0.14	-302	0.07	5.72
1040	100	19.38	12.01	352	0.12	-305	0.61	5.72
1043	100	19.28	12.01	353	0.10	-307	1.08	5.72
1046	100	19.34	12.01	353	0.11	-308	0.99	5.73
1049	100	19.41	12.00	353	0.10	-310	1.09	5.72
1052	100	19.39	12.00	354	0.10	-311	0.93	5.72

Observations: _____

Sample ID: MW16- PW- 10 Sample Date: 9-21-01 Sample Time: 10:55

Analytes: VOC, DOC

Well Purge/Sampling Form

Well Data **Page 1 of 1**

Project: LCAHP / 775871
Well Number: MW16-PW-1S
Date: 9-21-01
L = Total Casing and Screen Length (ft): —
Sampler(s): B. Woody, S Smallwood
W = Depth to Water (ft BTOC): 5.50 TOC / 5.51
PID Reading (ppm): —
D = Casing diameter (in): —
Purge/Sample Method: Low Flow
V = Volume of Water in Casing: —
Field Alkalinity Results: —
Field Fe II Results: Fe+2 0.00 / TOTAL Fe 0.07
Total Volume Purged: ~ 4.2 L ~~10~~ 8.8 equipment volume

TOP of Re (TOP) = 13.4

(See back)
Pump volume = 350 ml
Line volume = (Top of pump) - (Water level)' • 9.5 ml / foot

Well Volume Calculation:
$V = 0.0408(D)^2 X (L - W)$
$V = 0.0408(\ )^2 X (\ \ ) =$ _____ gallons

1 equipment volume = pump volume (ml) + line volume (ml)
350 ml + 74.86 ml = 424.86 ml
3 equipment vol = 1274

= 13.38 feet - 5.50' • 9.5 ml/ft = 74.86 ml Starting WL = 5.50 TOC

Purge Data

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
0815	100	18.39	11.15	392	2.85	-170	1.73	5.52
0818	100	18.72	11.90	398	1.95	-207		
0916	100	20.23	12.23	405	1.42	-207	1.35	5.51
0919	100	19.68	12.28	405	1.09	-228	1.41	5.51
0922	100	19.56	12.29	407	0.79	-257	1.30	5.51
0925	100	19.54	12.30	406	0.62	-268	0.91	5.51
0928	100	19.57	12.30	406	0.54	-277	0.86	5.51
0931	100	19.60	12.30	406	0.46	-280	0.76	5.51
0934	100	19.61	12.28	407	0.41	-283	0.60	5.51
0937	100	19.63	12.30	406	0.35	-285	4.77	5.51
0940	100	19.67	12.30	406	0.32	-286	1.67	5.51
0943	100	19.70	12.30	407	0.30	-287	0.70	5.51
0946	100	19.70	12.30	407	0.20	-288	0.53	5.51
0949	100	19.74	12.30	407	0.17	-289	0.65	5.51

Observations: _____

Sample ID: MW16-PW-1S Sample Date: 9-21-01 Sample Time: 10:00

Analytes: VOC, DOC

Well Purge/Sampling Form

Well Data Page 1 of 1

Project: LCAAP

Date: 9-20-01

Sampler(s): B. Woody S. Smallwood

PID Reading (ppm):

Purge/Sample Method: Low Flow

Field Alkalinity Results: 0 mg/l CaCO3 / 0 mg/l total

Field Fe II Results: Fe+2 0.04 mg/L / TOTAL FE 0.05 mg/L

Well Number: ~~MW16-PW-3D~~ ~~2D~~ MW16-PW-2D

L = Total Casing and Screen Length (ft):

W = Depth to Water (ft BTOC): 4.49 / 5.07 TOP = 79.8

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: ~3.9 L = ~ ~~5.5~~ 5.2 EV

see PW-1S for volume calculation

EV = ~~2057 ml~~ 2182.9 ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1549	100	21.53	9.64	285	0.44	10	6.86	4.64
1552	100	21.57	10.13	282	0.30	-11	5.36	4.67
1555	100	21.60	10.64	280	0.21	-39	3.84	4.72
1558	~~100~~ 100	21.91	10.95	279	0.16	-53	3.55	4.82
1601	100	21.90	11.09	280	0.12	-61	3.38	4.90
1604	100	22.08	11.13	279	0.12	-63	3.46	4.93
1607	100	22.03	11.15	279	0.11	-64	3.38	4.96
1610	100	22.00	11.17	277	0.11	-67	3.68	4.99
1613	100	22.05	11.19	281	0.10	-67	3.85	5.01
1616	100	21.99	11.21	279	0.09	-70	3.52	5.04
1619	100	22.07	11.24	279	0.09	-71	3.54	5.09
1622	100	22.22	11.23	278	0.09	-71	3.68	5.12
1625	50	22.76	11.23	277	0.09	-72	3.74	5.13
1628	50	22.79	11.24	276	0.08	-71	3.38	5.13
1631	50	22.91	11.25	276	0.09	-71	3.37	5.13

Observations:

Sample ID: MW16-PW-2D Sample Date: 9-20-01 Sample Time: 16:41

Analytes: VOCs, DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Well Data

Project: LCAAP 775871

Well Number: MW16-PW-2S

Date: 09-20-01

L = Total Casing and Screen Length (ft): —

Sampler(s): B. Woody, S. Smallwood

W = Depth to Water (ft BTOC): 2.54 / 2.50 top = 12.7

PID Reading (ppm): —

D = Casing diameter (in): —

Purge/Sample Method: Low Flow

V = Volume of Water in Casing: —

Field Alkalinity Results: Total = 0 mg/l

Field Fe II Results: Fe+2 3.30 mg/L / Total Fe 3.30

Total Volume Purged: 5.1 L (~~11.5~~ 10.9 EV)

See PW-1S for Volume Calc.

3 EV = ~~1776~~ ml 1409.2

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

WATER LEVEL 2.54' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1419	100	23.81	9.09	655	1.52	-71	22.3	2.60
1422	100	23.01	9.11	681	1.11	-101	48.1	2.61
1425	100	22.74	9.21	692	0.83	-148	56.6	2.61
1428	100	22.66	9.27	695	0.71	-162	62.6	2.62
1431	100	22.61	9.31	692	0.64	-173	81.5	2.63
1434	100	22.60	9.35	690	0.14	-179	59.6	2.64
1437	100	22.58	9.37	689	0.11	-185	50.9	2.64
1440	100	22.70	9.38	697	0.09	-189	59.3	2.64
1443	100	22.68	9.38	698	0.08	-186	71.7	2.64
1446	100	22.62	9.37	702	0.08	-181	62.6	2.64
1449	100	22.60	9.35	699	0.07	-177	57.4	2.64
1452	100	22.66	9.35	697	0.07	-175	61.7	2.64
1455	100	22.68	9.35	697	0.07	-175	61.9	2.64
1458	100	22.67	9.35	697	0.07	-175	64.3	2.64
1501	100	22.59	9.36	697	0.06	-175	48.3	2.64

Observations: _____

Sample ID: MW16-PW-3S

Sample Date: 9-20-01

Sample Time: 15:15

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Purge Data MW16-PW-25

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤ 50	<0.01 Ft Increase
1504	100	22.59	9.36	698	0.06	-175	36.0	2.64
1507	100	22.46	9.36	700	0.06	-175	43.8	2.64

Well Purge/Sampling Form

Well Data Page 1 of 1

Project: ALCAAP 775871 Well Number: MW16-PW-3D

Date: 9-20-01 L = Total Casing and Screen Length (ft): —

Sampler(s): B. Woody, S. Smallwood W = Depth to Water (ft BTOC): 4.67' / 4.69' TOP = 35.6

PID Reading (ppm): — D = Casing diameter (in): —

Purge/Sample Method: Low Flow V = Volume of Water in Casing: —

Field Alkalinity Results: ~~Total = 0 mg/l~~ As CaCO3 = 316.3 0 mg/l

Field Fe II Results: FE II 0.04 mg/L / TOTAL FE 0.04 mg/L Total Volume Purged: ~3.6 L = ~~5.6~~ 5.2 EV

See PW-15 for Volume Calc

~~3 EV~~

3 EV = ~~643.7 ml~~ 2064.0 ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data WL = 4.67' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1256	100	23.77	11.83	179	1.11	3	0.25	4.69
1259	100	21.50	12.36	265	0.36	-75	1.18	4.69
1302	100	21.34	12.41	274	0.27	-113	0.76	4.69
1305	100	21.26	12.44	275	0.22	-134	0.17	4.70
1308	100	21.06	12.46	276	0.20	-151	0.00	4.70
1311	100	21.06	12.47	277	0.19	-160	0.00	4.70
1314	100	20.98	12.48	278	0.17	-170	0.00	4.70
1317	100	21.06	12.49	277	0.16	-174	0.00	4.70
1320	100	21.03	12.50	278	0.15	-179	0.00	4.70
1323	100	20.98	12.50	278	0.14	-182	0.00	4.70
1326	100	21.03	12.50	277	0.15	-185	0.00	4.70
1329	100	21.18	12.51	277	0.14	-187	0.00	4.70

Observations: _____

Sample ID: MW16-PW-3D Sample Date: 9-20-01 Sample Time: 13:37

Analytes: VOC, DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Well Data

Project: 775871 / LCAAP
Well Number: MW16-PW-3S
Date: 9-20-01
L = Total Casing and Screen Length (ft): —
Sampler(s): R. Woody, S. Smallwood
W = Depth to Water (ft BTOC): 4.76' / 4.79 TOP = 11.
PID Reading (ppm): —
D = Casing diameter (in): —
Purge/Sample Method: Low Flow
V = Volume of Water in Casing: —
Field Alkalinity Results: ~~Total Alk~~ Alk As CaCO3 = 2.0 mg/l (RPW) Total Alk As CaCO3 = 20. mg/l (RPW)
Field Fe II Results: FE II 0.00 / TOTAL FE 0.11 Total Volume Purged: ~3.0 L ~~7.2~~ 6.5 EV

See PW-1S G. Volume Calc.

3 EV = ~~1254~~ ml
1389.7

Well Volume Calculation:
$V = 0.0408(D)^2 X (L - W)$
$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

Starting WL = ~~5~~ 4.76' TOC (RPW)

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
0839	110	20.19	12.03	191	3.05	-94	0.00	4.76
0842	110	20.41	12.27	193	2.15	-143	0.0	4.78
0845	110	20.50	12.34	195	1.66	-172	0.0	4.79
0848	100	20.60	12.37	195	1.33	-186	0.0	4.79
0851	100	20.65	12.39	197	1.19	-192	0.0	4.79
0854	100	20.72	12.40	197	0.95	-197	0.0	4.79
0857	100	20.79	12.42	197	0.82	-201	0.0	4.79
0900	100	20.81	12.42	199	0.72	-204	0.0	4.79
0903	100	20.88	12.42	200	0.66	-205	0.0	4.79
0906	100	20.89	12.42	200	0.55	-207	0.0	4.79
0909	100	20.88	12.42	199	0.51	-209	0.0	4.79
0912	100	20.89	12.41	200	0.45	-212	0.0	4.79

Observations: _____

Sample ID: MW16PW-PW-3S Sample Date: 9-20-01 Sample Time: 10:00
Collect duplicate MW16-PW-103S & MS/MSD MW16-PW-3S MS/MSD
Analytes: _____

Well Purge/Sampling Form

Well Data Page 1 of 1

Project: LCAAP 775871
Date: 9/19/01
Sampler(s): B. Wood, S. Smallwood
PID Reading (ppm): —
Purge/Sample Method: Low Flow
Field Alkalinity Results: —
Field Fe II Results: 0.01 FeII / 0.05 Total Fe

Well Number: MW16-PW-4D
L = Total Casing and Screen Length (ft): —
W = Depth to Water (ft BTOC): 6.46' / 6.48 TOP = 32.
D = Casing diameter (in): —
V = Volume of Water in Casing: —
Total Volume Purged: ~3.1 L = ~~5.2~~ 4.8 EV

See PW-15 ~~not~~ for Volume Calculation

EV = ~~1796.7~~ ml
1980.81

Well Volume Calculation:
$V = 0.0408(D)^2 X (L - W)$
$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data Starting WL = 6.46' TOC

Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
15:30	140	19.49	10.76	119	0.54	100	0.0	6.56
1534	100	19.70	11.00	121	0.26	83	0.0	6.51
15:37	100	19.91	11.07	121	0.22	76	0.0	6.51
1540	100	19.87	11.11	121	0.20	68	0.0	6.52
1543	100	19.54	11.16	122	0.17	66	0.0	6.51
1546	100	19.62	11.18	121	0.16	56	0.0	6.51
1549	100	19.33	11.21	122	0.15	54	0.0	6.51
1552	100	19.44	11.21	122	0.15	76	0.0	6.51
1555	100	19.72	11.24	123	0.16	89	0.0	6.51
1558	100	19.63	11.26	124	0.14	92	0.0	6.51
1601	100	19.65	11.27	124	0.14	93	0.0	6.51

Observations: _____

Sample ID: MW 16-PW-4D Sample Date: 9-17-01 Sample Time: 16:06

Analytes: VOC DOC

Well Purge/Sampling Form

Well Data

Project: LCAAP / 775871

Date: 9-19-01

Sampler(s): R. Woody, S. Smallwood

PID Reading (ppm): —

Purge/Sample Method: Low Flow

Field Alkalinity Results: —

Field Fe II Results: ~~0.03 mg/L Fe~~

Well Number: MW 16-PW-45

L = Total Casing and Screen Length (ft): —

W = Depth to Water (ft BTOC): 6.02 / ~~6.46~~ 6.02 Top = 12.

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: ~2.7L = ~~6.6~~ 5.8 EV

See PW-15 for Volume Calculation

Ferric 0.03 mg/l
Ferric 0.0 mg/l

3EV = ~~1230.7~~ ml
1402.26

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

Starting WL = 6.02' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
8:03	100	18.27	11.05	123	2.89	20	0.0	6.06
8:10	100	18.25	11.45	122	2.08	-12	0.0	6.09
8:18	100	18.31	11.62	123	1.38	-42	0.0	6.02
8:21	100	18.34	11.63	123	1.21	-51	0.0	6.04
0824	100	18.30	11.66	122	1.10	-57	0.0	6.04
0827	100	18.31	11.67	122	0.95	-63	0.0	6.06
0830	100	18.34	11.70	121	0.82	-69	0.0	6.06
0833	100	18.31	11.72	121	0.75	~~-74~~ -74	0.0	6.06
0836	100	18.34	11.72	121	0.69	-76	0.0	6.06

Observations: _____

Sample ID: MW16-PW-45 Sample Date: 9-19-01 Sample Time: 08:43

Analytes: VOC, DOC

Well Purge/Sampling Form

Well Data

Project: LCAAP / 77587 | Well Number: P2-2D

Date: 10-02-01 | L = Total Casing and Screen Length (ft): 51.95' TOC

Sampler(s): B. Wood, S. Smallwood | W = Depth to Water (ft BTOC): 6.37' / 7.35' TOP = 47.0'

PID Reading (ppm): — | D = Casing diameter (in): 2"

Purge/Sample Method: Low Flow | V = Volume of Water in Casing: —

Field Alkalinity Results: —

Field Fe II Results: — | Total Volume Purged: 13.2 L ~ 24.2 EV

See Back of P2-3 for Volume Calc.

3 EV = 867.2 ml

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data Starting Water Level = 6.37' below TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
0848	100	13.42	8.67	463	5.23	159	448	6.62
0851	100	13.45	8.63	466	3.80	146	902	6.64
0854	150	14.26	8.60	467	2.42	96	495	7.01
0857	150	14.22	8.59	464	1.98	77	229	7.19
0900	150	14.27	8.59	467	1.94	55	158	7.26
0903	150	14.15	8.58	465	1.78	43	128	7.36
0906	150	14.15	8.58	467	1.56	30	118	7.47
0909	150	14.10	8.57	474	1.64	22	96.2	7.52
0912	150	14.11	8.56	469	1.48	17	82.2	7.59
0915	150	14.14	8.57	469	1.32	15	73.6	7.64
0918	150	14.10	8.56	470	1.39	12	68.2	7.69
0921	150	14.11	8.56	467	1.26	11	69.3	7.70
0924	150	14.11	8.56	467	1.37	9	62.0	7.74
0927	150	14.12	8.56	467	1.29	8	60.8	7.77
0930	150	14.12	8.56	468	1.34	6	54.9	7.80

Observations: _____

Sample ID: P2-2D | Sample Date: 10-02-01 | Sample Time: 1020

Analytes: Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Purge Data

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
0933	150	14.12	8.56	468	1.32	6	63.8	7.83
0936	150	14.10	8.56	470	1.32	6	62.8	7.85
0939	150	14.10	8.56	471	1.36	6	66.2	7.89
0942	150	14.13	8.56	476	1.29	5	69.4	7.89
0945	150	14.13	8.56	472	1.26	5	69.4	7.89
0948	150	14.11	8.56	472	1.32	5	67.7	7.91
0951	150	14.11	8.57	473	1.33	5	69.6	7.95
0954	150	14.18	8.57	474	1.33	5	71.5	7.99
0957	150	14.18	8.57	472	1.28	5	71.0	7.99
1000	150	14.26	8.56	471	1.33	5	69.4	7.99
1003	150	14.23	8.56	472	1.33	4	64.7	7.99
1006	150	14.30	8.57	478	1.31	4	57.7	7.99
1009	150	14.32	8.57	472	1.29	4	59.8	7.99
1012	150	14.31	8.56	470	1.29	4	55.6	7.99
1015	150	14.34	8.56	478	1.18	4	48.1	7.99

Well Purge/Sampling Form

Well Data

Project: LCAAD 177571 | Well Number: P2-2S

Date: 10-01-01 | L = Total Casing and Screen Length (ft): 26.74'

Sampler(s): B. Woody, S. Smallwood | W = Depth to Water (ft BTOC): 6.64' / 8.98' TOP = 21.8

PID Reading (ppm): — | D = Casing diameter (in): 2"

Purge/Sample Method: Low Flow | V = Volume of Water in Casing: —

Field Alkalinity Results: —

Field Fe II Results: — | Total Volume Purged: 5.7L ~ 18.6 EV

See Back of P2-3 for Volume Calc.

3 EV = 921.30

~~Well Volume Calculation:~~

~~$V = 0.0408(D)^2 \times (L - W)$~~

~~$V = 0.0408(\ )^2 \times (\quad) =$ _____ gallons~~

Purge Data Starting Water Level = 6.64' TOC

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1542	100	20.57	8.26	303	3.21	113	36.1	6.64
1545	100	18.72	8.20	305	1.79	117	85.2	7.02
1548	100	17.87	8.17	304	~~304~~ 1.44	119	105.8	7.41
1551	150	17.29	8.16	304	1.14	119	108.7	7.84
1554	150	16.59	8.15	303	1.13	119	94.4	8.26
1557	150	16.38	8.16	303	1.08	118	93.9	8.64
1600	150	16.20	8.15	304	0.95	114	41.2	9.08
1603	150	16.07	8.15	308	0.95	109	25.3	9.44
1606	150	16.13	8.16	309	0.81	106	17.3	9.59
1609	150	16.11	8.16	304	0.79	103	14.2	9.79
1612	150	16.00	8.16	304	0.67	99	11.6	9.92
1615	150	15.95	8.16	303	0.67	96	10.14	10.08
1618	50	16.70	8.16	303	0.61	93	9.69	9.86
1621	50	17.40	8.16	304	0.53	91	6.25	9.62
1624	50	17.79	8.17	304	0.53	86	5.05	9.41

Observations: _____

Sample ID: P2-2S | Sample Date: 10-01-01 | Sample Time: 1637

Analytes: Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Purge Data P2-2S

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
16.27	50	18.24	8.18	307	0.42	82	4.49	9.21
16.30	50	18.16	8.18	305	0.43	79	4.10	9.09

Well Purge/Sampling Form

Well Data AT

Project: LCMAP / 775871

Date: 9/10-01-01

Sampler(s): Brandy S. Smallwood

PID Reading (ppm): —

Purge/Sample Method: Low Flow

Field Alkalinity Results:

Field Fe II Results:

Well Number: C2-3

L = Total Casing and Screen Length (ft): ~~29.94~~ 24.9

W = Depth to Water (ft BTOC): 6.57' / 12.71" TOP = 19.9

D = Casing diameter (in): 2"

V = Volume of Water in Casing: —

Total Volume Purged: 5.7L ~ ~~25.2~~ 19.7 EV

See Back

~~Well Volume Calculation:~~

~~V = 0.0408(D)² X (L - W)~~

~~V = 0.0408( )² X ( ) = _____ gallons~~

Purge Data Starting WL = 6.57' TOC

Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
		Water Quality Parameters						
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
1003	100	18.77	8.18	546	4.59	173	19.7	6.76
1006	100	18.55	8.23	553	4.21	175	22.4	7.45
1009	100	18.96	8.25	553	4.01	176	23.7	7.72
1012	100	18.62	8.26	553	3.95	177	22.4	8.05
1015	100	18.55	8.27	553	4.07	177	21.2	8.37
1018	100	18.48	8.28	551	4.00	178	22.1	8.69
1021	100	18.57	8.29	551	3.99	179	17.7	8.98
1024	100	18.56	8.29	555	4.02	179	17.7	9.23
1027	100	18.62	8.29	557	3.93	179	16.0	9.45
1030	100	18.62	8.29	553	3.76	179	16.6	9.69
1033	100	18.59	8.30	558	3.59	179	17.4	9.92
1036	100	18.71	8.30	554	3.66	179	19.1	10.12
1039	150	18.42	8.30	557	3.54	179	18.4	10.45
1042	150	18.18	8.31	559	3.66	178	15.6	10.91
1045	150	18.10	8.31	553	3.58	179	16.7	11.28

Observations:

Sample ID: C2-3 Sample Date: 10-10-01 Sample Time: 1102

Analytes: DOC, Alkalinity, Major Cations, Major Anions

Well Purge/Sampling Form

Purge Data PZ -3

		Water Quality Parameters						
Time	Pump Flow Rate (ml/min)	Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10		<0.01 Ft Increase
1048	150	18.51	8.32	554	3.22	178	16.4	11.57
1051	150	18.16	8.32	546	3.22	178	15.5	11.86
1054	150	18.07	8.31	546	3.40	178	13.5	12.17
1057	150	18.00	8.33	541	3.52	178	14.5	12.49
1100	150	18.06	8.33	539	3.52	178	13.4	12.78
1103	50	18.79	8.33	539	3.05	177	13.5	12.78
1106	50	19.30	8.33	535	2.46	176	10.29	12.77
1109	50	19.57	8.33	531	2.36	176	12.7	12.72
1112	50	20.21	8.33	527	2.03	173	13.8	12.69
1115	50	20.39	8.33	523	1.98	172	13.5	12.68
1118	50	20.43	8.33	519	1.93	172	12.4	12.65
1121								

Surface Water

~~Well Purge~~/Sampling Form

Well Data

Project: LCAAP 775971

~~Well~~ Number: SW16-01

Date: 10-01-01

L = Total Casing and Screen Length (ft): —

Sampler(s): B. Woody Scott Smallwood

W = Depth to Water (ft BTOC): —

PID Reading (ppm): —

D = Casing diameter (in): —

~~Purge~~/Sample Method: Grab

V = Volume of Water in Casing: —

Field Alkalinity Results: —

Field Fe II Results: —

Total Volume Purged: —

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons

Purge Data

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	± 0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
09:07		12.11	7.70	742				

Observations: Location is At the South Weir. Water is Clear & Colorless.

Sample ID: SW16-01

Sample Date: 10-01-01

Sample Time: 09:07

Analytes: VOC

Surface Water

~~Well Purge~~/Sampling Form

Well Data **Page 1 of ____**

Project: LCAAP 775971

Date: 10-01-01

Sampler(s): B.Wood, S Smallwood

PID Reading (ppm): —

~~Purge~~/Sample Method: Grab

Field Alkalinity Results: —

Field Fe II Results: —

Well Number: ~~P~~SW16-02 ~40' North of PRW

L = Total Casing and Screen Length (ft): —

W = Depth to Water (ft BTOC): —

D = Casing diameter (in): —

V = Volume of Water in Casing: —

Total Volume Purged: —

Well Volume Calculation:

$V = 0.0408(D)^2 X (L - W)$

~~$V = 0.0408(\ )^2 X (\quad) =$ _____ gallons~~

Purge Data

Time	Pump Flow Rate (ml/min)	Water Quality Parameters: Temperature (°C)	pH	Specific Conductivity (µS /cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Depth to GW (ft BTOC)
	Zero Drawdown	±0.5°C	±0.1	±3%	±0.2	±10	≤50 NTU	<0.01 Ft Increase
13:07		20.6	8.46	10				

Observations: Sample location Marked with yellow Caution Tape. Located ~ 40' North of PRW in Stream East of PRW. Water is clear + colorless

Sample ID: SW16-02 Sample Date: 10-01-01 Sample Time: 13:07

Analytes: VOC

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE

(Read instructions on the reverse side prior to initiating this form)

DATE 11/29/01

TRANSMITTAL NO. 37

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TO: US Army Engineer District, Kansas City
Attn: CENWK (Mr. K. Boese)
700 Federal Building
601 E. 12th Street
Kansas City, MO 64106-2896

FROM:
J. Keith Walker
Sr. Project Manager

CONTRACT NO
DACW41-98-D-9006,
Task Order #003
WAD 005

CHECK ONE:
[X] THIS IS A NEW TRANSMITTAL
[ ] THIS IS A RESUBMITTAL OF TRANSMITTAL

SPECIFICATION SEC. NO.
Draft-Final RAMP and Draft-Final RAR

PROJECT TITLE AND LOCATION:
Lake City Army Ammunition Plant
Independence, Missouri

ITEM NO a.	DESCRIPTION OF ITEM SUBMITTED (Type, size, model number, etc.) b.	MFG. OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. (See Instruction No. 8) c.	NO. OF COPIES d.	CONTRACT REFERENCE DOCUMENT SPEC. PARA. NO. e.	CONTRACT REFERENCE DOCUMENT DRAWING SHEET NO. f.	FOR CONTRACTOR USE CODE g.	VARIATION (See Instruction No. 6) h.	FOR C E USE CODE i.
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	3rd Quarter							
	Quarterly Data Summary							
	August to October 2001							
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REMARKS

QC CERTIFICATION

_____This item(s) has been reviewed in detail and is correct and in strict conformance with the contract drawings and specifications.

_____Approved with corrections as noted on submittal data and/or attached sheet(s)

SIGNATURE: _____
TITLE: _____
DATE: _____

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.
IT Corporation

for J. Keith Walker

NAME AND SIGNATURE OF CONTRACTOR

Same 11/14

Section II - APPROVAL ACTION

ENCLOSURES RETURNED (List by Item No.)	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE

REPLICA OF ENG FORM 4025, May 91

JOHN MOYLAN
CONSULTING GEOLOGIST

5306 West 57th Street
Shawnee Mission, Kansas 66205
(913) 262-1557

August 1, 2002

Mr. Keith Walker
Shaw Environmental & Infrastructure
4400 College Blvd., Suite 150
Overland Park, Kansas 66211

Dear Mr. Walker:

I am pleased to transmit the Independent Evaluation Report for the LCAAP Northeast Operable Unit Permeable Reactive Wall. Copies of the report and of this letter have been transmitted directly to the following addressees.

Thomas Buechler, Dept. of the Army, LCAAP (2 copies)

Kirk Boese, U. S. Army Engineer District, Kansas City (5 copies)

Scott Marquess, U. S. Environmental Protection Agency (1 copy)

Mitch Scherzinger, Missouri Department of Natural Resources (2 copies)

Scott Honig, Federal Facilities Section, Hazardous Waste Program, MDNR (2 copies)

Bryan Rundell, TechLaw (1 copy)

Jeff Armstrong, U. S. Army Environmental Center (2 copies)

Kenneth G. Barnes, USA Operations Support Command (1 copy)

Gaynor Dawson, PPC (1 copy)

Gary Gaillot, Shaw E&I (2 copies)

Keith Walker, Shaw E&I (3 copies)

I would like to thank all of the members of the project team who provided assistance and input for this evaluation. Should you or any of the project team have questions, please feel free to contact me at (913) 262-1557 or e-mail at johnmoylan@att.net.

Sincerely,

John E. Moylan

John E. Moylan, R.G., C.E.G.
Consulting Geologist

PERMEABLE REACTIVE WALL INDEPENDENT EVALUATION REPORT

NORTHEAST OPERABLE UNIT, LAKE CITY AAP, INDEPENDENCE, MO.

Prepared for
Shaw Environmental and Infrastructure
Under P.O. 194608

August 2002
Prepared by
John E. Moylan, R.G., C.E.G.
Consulting Geologist

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Figure 7-32 PW-4D Pump Test, PW-4S Time-Drawdown Plot

Figure 7-33 PW-4D Pump Test, PZL-20D Time-Drawdown Plot

Figure 7-34 PW-4D Pump Test, PW-3D Time-Drawdown Plot

Figure 9-1 Recommended Geoprobe™ Locations

Figure 9-2 Recommended Monitoring Well/Piezometer Locations

EXECUTIVE SUMMARY

The report presents the results of an independent evaluation of the performance of the Permeable Reactive Wall (PRW) at the Northeast Corner Operable Unit at the Lake City Army Ammunition Plant in Independence, Missouri. All of the available data from the pre-design investigations, design, construction, and performance monitoring of the PRW were reviewed and used in this evaluation.

All types of the available data were integrated in making a comprehensive evaluation. The report discusses each type of data separately. However, the conclusions are based on the integrated evaluation of the data. The data clearly show that the PRW is not performing as intended. The conclusions of the evaluation are as follows.

- A significant but unknown portion of the plume is bypassing the PRW. The flow pattern that has developed since the PRW was constructed is complex.

- The chlorinated hydrocarbon contamination in the portion of the plume that is currently passing through the PRW appears to be degrading to below MCLs.

- There are three major causes of the plume bypass.
    - The PRW is not aligned parallel to the pre-construction equipotential contours.
    - The hydraulic conductivity of the PRW backfill is low and varies laterally.
    - There is a low conductivity skin at the PRW trench walls.

- Limited pre-design investigation and delayed implementation of the performance monitoring program (PW and CW wells) have hindered timely recognition of the performance problems and understanding the causes and effects of the bypass.

- The wells in the in the CW-PW transects are not located along flow lines due to the flow redistribution.

- The end stop and clay sliver near the location of PW-2 has little effect on the performance of the PRW.

- Non-chemical PRW deficiencies overshadowed the question of the effective life of the PRW.

In accordance with the scope of work, recommendations have been developed regarding if and how the PRW can be modified to passively treat the VOC plume without allowing plume bypass or either upgradient or sidegradient groundwater discharge to the ground surface.

It is unlikely that an economical and effective modification of the PRW that guaranteed total plume capture and treatment is possible. However, it is considered potentially more feasible to allow the as-constructed PRW to treat the flux that is now passing through and to supplement the PRW with one or more remedial add-ons to capture and treat the bypass plume flow. It might also be possible to construct upgradient lateral collection trenches that direct the plume into iron filled gates constructed through the existing PRW. It is possible that trenches and gates would not have to extend to bedrock.

Before any of the above remedies could be seriously evaluated, considerable additional site characterization is needed to define the problem in detail. It might be wise to conduct a study using 'Value Engineering' methods. The team would be comprised of a number of technical experts and the stakeholders. Selection of a qualified facilitator is required in this very effective means of solving difficult problems.

In addition, the report contains recommendations for additional investigations needed to remediate the plume. It must be recognized that the current groundwater flow pattern at the site is different than the flow pattern prior to construction of the PRW and that the plume shape and dimensions is likely changing at various rates in response to the new flow regime. The current flow pattern will change little if any unless it is further modified. However, the contaminant pattern should continue to change for some unknown time into the future. Once the flow pattern is characterized, then predictions of the resulting plume configuration(s) can be made. The chemical data would be used primarily to estimate the nature and extent of the pre-construction plume, whether there were one or multiple plumes, and to locate the sources of the groundwater contamination plume(s).The following are three major goals of the additional investigations.

- Collect enough chemical data to define the lateral and vertical limits of the contaminated groundwater plume and to determine whether there are one or multiple plumes.
- Collect enough water level data to define the current potentiometric surface and groundwater flow pattern.
- Determine the effect of the ditch on groundwater flow and contaminant migration in the vicinity of the northeast end of the PRW.

Section 9 includes specific investigations needed to fill important data gaps.

1 INTRODUCTION

1.1 General

The purpose of this report is to present the results of an independent evaluation of the performance of the Permeable Reactive Wall (PRW) at the Northeast Corner Operable Unit at the Lake City Army Ammunition Plant (LCAAP) in Independence, Missouri. The evaluation was conducted under contract to Shaw Environmental and Infrastructure Inc. (Shaw E&I). However, the review and evaluation were conducted independently without input or review by Shaw E&I, the U.S. Army, U.S. Environmental Protection Agency (EPA), the Missouri Department of Natural Resources (MDNR), or any of the other parties involved in the remediation project. All of the conclusions are those of the author and are based on the data provided for the review and evaluation.

The author would like to state that this evaluation was done with the benefit of hindsight and it should be recognized that permeable reactive barrier design and performance evaluation is a new area of remedial engineering. Few detailed case studies are available on which to base designs.

1.2 Scope of Services

The scope of work for the evaluation contained four specific tasks.

1. Attend presentation of the PRW Hydrologic Assessment Report at LCAAP on June 10, 2002.
2. Review the history of the wall from concept through design to construction and subsequent monitoring. This would include a review of documents including but not limited to:
   - The Record of Decision for the interim action, including any documents referenced therein as deemed necessary by the consultant.
   - The Remedial Action Management Plan (RAMP) and related design documents and pre-design investigation reports. Construction documents such as the Interim Remedial Action Report (Construction Summary Report), field notes, testing procedures and results, and other construction records.
   - Performance monitoring plans and results to date, including recently completed hydraulic testing results.
   - Interviews, as required, with the individuals involved with the planning, design, construction and monitoring of the PRW as deemed necessary.
3. Perform a field inspection of the PRW to become familiar with the field terrain, location of the hydraulic features such as drainage channels, etc., and the location of monitoring wells, piezometers, and other collection points.

   Determine the adequacy of existing monitoring network and all sampling and testing conducted to date on the PRW with respect to the validation or confirmation of the performance of the PRW. If necessary, recommend additions

to the site monitoring network or additional sampling and testing that are required due to known construction deficiencies and hydraulic issues.

Assess the performance of the wall relative to its intended function. Should it be deemed not to be performing as intended, recommend actions that should be considered to improve its hydraulic performance to include technologies to be used.

Evaluate the impact of the efficiency of treatment of VOCs and life expectancy of the PRW due to low iron content in portions of the PRW. If necessary, recommend actions to be taken to improve treatment of VOCs and increase life expectancy of the PRW.

4. Prepare a technical report summarizing work performed and documenting conclusions and recommendations. Consultant shall be required to present findings to the FFA Team that includes representatives of the USEPA, MDNR, and LCAAP.

1.3 Report Organization

The subsequent sections of this report present evaluations of the various aspects of the investigation, design, construction, and performance monitoring of the PRW.

Section 2	Pre-Design Investigations
Section 3	Design
Section 4	Construction
Section 5	Groundwater Level Elevations
Section 6	Chemical Data
Section 7	Pump Test
Section 8	Conclusions
Section 9	Recommendations

The conclusions contained in Section 8 will be conclusions that integrate the observations made in Sections 2 through 7 into summary conclusions regarding the PRW and its effectiveness.

1.4 References

The documents and correspondence used as reference material for the performance of the evaluation are listed at the end of the report.

2 PRE-DESIGN INVESTIGATIONS

The top of bedrock in the vicinity of the PRW was clearly defined by the numerous cone penetrometer probes. The cone data also show that there are no major changes in soil type across the length of the PRW alignment. The general geologic cross-section along the PRW alignment is shown on Figure 2-1.

It would have been helpful to have had water level and chemical data from more locations both along the PRW alignment and from both upgradient and downgradient of the PRW alignment. The potentiometric surface maps that were available for the design of the PRW (Figures 2-2 and 2-3) show approximately 2.5 feet of difference in groundwater surface elevation over the length of the PRW in the shallow zone and approximately 5 feet in the deep zone. Differences in groundwater level along the length of a permeable reactive barrier can cause flow redistribution in the vicinity of the barrier. This will be discussed in more detail later in this report. Groundwater level elevations from more locations would have provided better definition of the potentiometric surface in the vicinity of the PRW.

The chemical data would have been adequate for designing the flow through thickness of the PRW if it could be assumed that the contaminant concentrations detected in the monitoring wells were indeed the maximum concentration along the width of the PRW. Generally it appears that the plume both upgradient of the PRW and along the PRW was not well defined (Figure 2-4). Without fairly precise definition of the concentration distribution both vertically and laterally along the PRW alignment, placement of performance monitoring wells is difficult and any post-construction plume distribution is nearly impossible to assess with accuracy. This aspect is discussed later sections in more detail.

The exploratory trenches that were excavated along the PRW alignment provided important information about the secondary porosity features in the uppermost soil as well as how the soil tends to perform in a trench excavation. The reviewed did not see the trenches; however, the photographs did not show much evidence of smearing. This might be partially attributable to the very silty nature of the soil.

Since a permeable reactive barrier (PRB) is a passive system, it is necessary in most cases to have better site characterization than what is needed to design an active hydraulic containment system. The reason is that the PRB utilizes the natural flow system and, therefore, must be designed to not alter that flow system since control of the flow cannot be easily regained. As a general rule it is wise to have borings approximately every 30 to 50 feet along the proposed alignment. It is clear that the lack of sufficient pre-design water level and chemical data have made it difficult to evaluate the performance of the PRW.

3 DESIGN

The design process is well documented in the Final Remedial Action Plan, Interim Remedial Action, Northeast Corner Operable Unit dated June 2000. The design carefully considered nearly all of the site parameters as defined by the accepted site characterization model at the time. An appropriate level of conservatism and adequate factors of safety were applied to the design to assure an effective PRB.

However, there is no indication that the orientation of the PRW relative to the contours of the potentiometric surface contours was considered. As discussed previously, the groundwater elevation varied considerably along the alignment of the PRW. This indicates that the PRW is not aligned parallel to the groundwater contours. This factor can have a great influence on the effectiveness of a PRB and is discussed in detail in later sections of this report.

4 CONSTRUCTION

4.1 General

With one exception, the design of the PRW was prudent and carefully considered the site characteristics. However, many of the uncertainties about the performance of the PRW stem from problems during the construction of the PRW. Specific aspects of the construction that might have affected the effectiveness of the completed PRW include:

- Slurry Level/Water Table Relationship
- Trencher Verticality
- Slurry Density
- Skin Formation
- Non-Uniform Iron Distribution
- End Stop and Clay Sliver

4.2 Slurry Level/Water Table Relationship

It appeared that most parties agreed that the much of the trench instability was due to the work bench surface being too close to the water table elevation. The intent was to keep the bench surface at least three feet higher than the water table. The design document recognized that the water table fluctuated by at least 6 feet. Gilbert Tallard (1992) recommended that the slurry level in polymer slurry trenches should be kept 5 feet above the water table since the density of polymer slurry is somewhat less than that of bentonite slurry. Tallard is a geotechnical engineer who is well known as a specialist in slurry wall construction. The 3 foot tolerance has come from bentonite slurry trenching experience and is also commonly accepted for polymer trench excavation.

4.3 Trencher Verticality

If the trencher is not vertical, the trench walls will not be vertical and the hanging wall of the trench will be stressed due to a greater gravitational force acting on that wall. This problem becomes worse as the trench depth increases. Considering the very weak nature of the soft silty clay, this must be considered a major potential cause of the trench instability that occurred especially before the time that the work bench was raised and stabilized.

4.4 Slurry Density

Polymer slurries tend to keep clay from being wetted and therefore, less likely to disperse into the slurry. This is a generally accepted principle and is used to advantage when

polymer slurries are used as drilling mud when drilling certain sensitive clay and shale deposits. The soils at the LCAAP PRW project are classified as clay under the Unified Soil Classification System. However, this system is based on the plasticity of fine-grained soils rather than strictly on particle size and/or percent of actual clay mineral. The gradations and word descriptions of the site soils indicate that silt-size particles form a larger percentage of the total than do the clays.

Stiff plastic clays will tend to remain as chunks when excavated with little being dispersed into the slurry. Silty materials, especially low density silty soils, will tend to disaggregate and disperse into the slurry. The greater the fines load in the slurry; the greater the density of the slurry. The viscosity of the slurry will tend to keep the particulate material in suspension but the particles will eventually tend to settle to the lower portions of the trench especially in the portion that has been excavated the longest (the portion being backfilled).

The construction slurry density data indicate that the slurry contained up to approximately 20 percent soil solids. The slurry density samples were reportedly taken only within four feet of the slurry surface. It is likely that higher density slurry existed near the trench bottom. When the slurry invaded the pore space of the newly dumped sand/iron mix, the result could be that at least 20 percent of the pore space of the resulting backfill contained soil fines. The percent of fines can be calculated using the following equation.

% of fines = porosity x % solids in slurry / (1-porosity) + (porosity x % solids in slurry)

The in-place dry density of iron or sand/iron backfill in PRBs seldom exceeds 50 percent. The following are approximations of the percent fines in a sand/iron mix of 50 percent porosity if slurry containing 10 percent and 20 percent fines was trapped in the pore space.

% Fines in Slurry	% Fines in Backfill Soils
10	9
20	17

Cedergren (1967) presents a table that demonstrates the effect of the addition of fines on the hydraulic conductivity of a typical washed filter aggregate.

% Passing the 100 Sieve	Hydraulic Conductivity, ft/day
0	80 to 300
2	10 to 100
4	2 to 50
6	0.5 to 20
7	0.2 to 3

4.5 Tremie Placement/Dumping

A tremie pipe is commonly used to place granular backfill or concrete in deep excavations or trenches in order to prevent segregation by particle size during free fall. In the case of an iron/sand mix the tendency to segregate is compounded due to the difference in density between the sand particles and the iron particles (approximate specific gravities of 2.6 and 5+ respectively). The result of particle segregation is non-uniform distribution of the iron and separate layers of finer and coarser sand.

Krug (2001) reported that clean water was added to the sand/iron mix as the mixture entered the top of the tremie pipe at the Sommersworth Superfund Site. The Sommersworth site is the most widely reported polymer slurry PRB of comparable dimensions to the LCAAP PRW. Water was added in order to displace the biopolymer from the bottom of the trench as the sand/iron mix was added and to reduce the potential for entrapment of air in the PRB. Both of these advantages are potentially very important. The first helps keep the sediment laden polymer slurry from entering the pore space of the backfill which would tend to reduce the hydraulic conductivity of the backfill and potentially delay or retard the reactivity of the iron. Unsaturated iron/sand backfill can fall to the lower portions of the trench without becoming saturated. Backfill with air-filled pores will have very low hydraulic conductivity and will actually keep the contaminated groundwater from coming in contact with the reactive material (zero valent iron).

The LCAAP specifications called for tremie placement of the iron/sand backfill. Introduction of the iron/sand backfill through a tremie pipe was briefly attempted but quickly abandoned due to bridging problems. There was apparently no attempt to add water at the top of the tremie. After failure of the dry tremie method, the slump placement method was then used to introduce the sand/iron backfill into the trench. This method is commonly and successfully used for the introduction of soil/bentonite in soil/bentonite slurry walls. There are significant differences in the desired properties of a soil/bentonite wall and a PRB. One is designed to be impermeable and the other is required to be permeable. The soil/bentonite backfill is first sluiced with bentonite slurry prior to placement and it will therefore, slump as a viscous mudwave into the trench. Unsaturated iron or iron/sand mix will not move as a viscous mudwave. As a result, the material may remain unsaturated with air-filled pore space and size and density segregation can be anticipated. The polymer slurry that does migrate into the pore space can be expected to be much more difficult to break since the iron in the mix increases the pH of the slurry. The placement of water saturated iron/sand backfill through a tremie has the advantage of maximizing the displacement of the polymer slurry with the water saturated iron/sand material.

4.6 Skin Formation

The large head differentials between the immediately upgradient monitoring wells and the monitoring wells in the trench and the head differential between the trench wells and

the monitoring wells immediately downgradient of the trench, indicate the presence of a skin or low conductivity zone at the interface between the trench and the formation.

The cause of the skin is not known with certainty. Smearing seems to be the cause most often attributed to low conductivity zone. The term 'smearing' has been commonly applied almost indiscriminately to the skin problem. Even though there is the potential for smearing, the low conductivity skin was due to other causes at all of the PRBs that the author has evaluated to date. The author is aware of at least two other causes of the low conductivity zone. One is densification of loose saturated sands when a vibratory pile hammer is used to the drive sheet piles used to support the trench excavation. The second is due to the migration of fines suspended in the polymer slurry into the walls of the trench. The slurry wants to flow into the formation in response to the excess head that must be maintained in the trench in order to support the trench walls. The greatest infiltration potential is into the most conductive layers. These are also the layers that carry the highest groundwater flow rates into the PRB and will have the greatest influence on PRB effectiveness. Breaking the polymer slurry will not remove the infiltrated fines from the formation.

Whatever the cause of the skin, it is very difficult to remove in a PRB. In water wells or in drainage curtains, a certain amount of hydraulic development can be accomplished in order to cause the particulate fines to migrate back out of the formation. However, it is not practical to develop a PRB.

4.7 Non-Uniform Iron Distribution

Descriptions from post-construction logs of borings in the PRW as well as laboratory analyses from these same borings clearly show that the iron is not uniformly distributed through the trench. They also show rather substantial vertical intervals of little or no iron. In addition, the apparent layers of segregated sand ranging from very fine sand to medium sand are potential sources of performance problems. If the layers pass through the full width of the PRW, the coarser layers will form preferential pathways resulting in higher than anticipated flow through velocities and less than anticipated residence times in the PRW.

4.8 End Stop and Clay Sliver

An H-beam end stop and a clay sliver have been determined to be in the completed trench at approximate Station 1+55. The presence of both of these items is a violation of the specifications. Both the clay sliver and the H-beam would tend to impede flow through the PRW at their location. The potential impact of the clay sliver and the beam will be discussed in the conclusions section.

4.9 Construction Conclusions

Several of the problems causing less than optimal PRW performance are the result of PRW construction. The reduced hydraulic conductivity of the PRW backfill and the apparent backfill segregation are largely the result of not sluicing the sand/iron backfill through a tremie with water. The fines content in the polymer slurry contributed to the low hydraulic conductivity of the PRW backfill and is also the most likely cause of the low hydraulic conductivity skin at the trench walls.

5 GROUNDWATER LEVELS

5.1 General

Groundwater level data are often the most important information available for evaluating the effectiveness of a PRB. Figures 2-2 and 2-3 show the conceptual potentiometric surfaces in the shallow and deep zones respectively at the time that the PRW was designed. These potentiometric maps were developed using the August 1999 groundwater level measurements. Both the pre-construction and post-construction water level data will be discussed in this section.

5.2 Evaluation of August 1999 Groundwater Level Data

5.2.1 Shallow Zone (Figure 2-2)

As discussed in Section 2, the static water level elevation along the PRW alignment differed by approximately 2.5 feet. It was at approximate elevation 744 at the southwest end of the alignment dropping to approximately elevation 741.5 somewhere between PW-2 and PW-3. The groundwater elevation remained at approximately 741.5 along the remainder of the alignment.

If a PRB is not aligned parallel to the equipotential contours, significant flow redistribution may occur after the PRB is constructed. Therefore, the pre-construction water level maps were reviewed in order to attempt to predict what changes might occur as a result of building along this alignment. The magnitude and extent of flow redistribution is affected by the hydraulic conductivity contrast between the formation and the PRB backfill. If the difference in conductivity is small, the effects are subdued. The following projections resulted from the review and they assume that the PRW backfill is significantly more conductive than the formation.

- The groundwater level in the PRW would be at approximately elevation 742 throughout the length of the PRW
- The width of capture would increase at the southwest end of the PRW including a small zone of downgradient capture
- The PRW would possibly form a hydraulic barrier at the northeast end with flow redistribution and plume bypass

5.2.2 Deep Zone (Figure 2-3)

The static water level along the length of the PRW alignment differed by approximately 5 feet. The groundwater level elevation was at elevation 740 to 741 northeastward of approximately PW-3 and dropped to less than elevation 736 at the southwest end of the PRW alignment. It should be noted that the difference between the pre-construction

water levels in the upper and lower zones was greatest at the southwest end of the alignment. This is attributed to the fact that the PRW appears to be located in a groundwater recharge area as evidenced by the significant downward gradient. The amount of head differential between the two zones increases with increasing thickness of the lower zone. The lower zone is thickest at the southwest end of the alignment.
The following projections were made for the deep zone as a result of PRW construction. It was not possible to make a projection of the likely resulting flow regime that would result from the combined effects of both the upper and lower zone flow patterns. The difficulty of making such a projection is due to a number of important unknowns, e.g. effective thickness and hydraulic conductivity of each zone.

- The groundwater surface in the PRW would be essentially flat with the water level at approximately elevation 738 to 739
- There would be flow into the upgradient side of the PRW northeasterly from a point near the roadway in the vicinity of PW-3
- The width of capture would likely extend a considerable distance beyond the northeast end of the PRW and there would also be downgradient capture near the northeast end of the PRW
- There would be flow out of the upgradient side of the PRW southwestward from the aforementioned roadway near PW-3
- Nearly the southwestern half of the PRW becomes a hydraulic barrier that diverts upgradient flow around the southwest end of the PRW

The hydraulic conductivity of the sand/iron mix could be expected to be much higher than that of the formation. The gradations of sand and the iron used for the project were very similar (Figure 5-1). ETI has reported the hydraulic conductivity of the Connelly -8 +50 iron as 149 feet/day based on laboratory hydraulic conductivity tests. The samples were densified somewhat prior to testing. Slug tests completed in actual PRB installations have yielded values of more than 300 feet/day. No hydraulic conductivity test data were available for the sand used on the project. However, Departments of Army et al (1983) presents an equation for estimating the hydraulic conductivity of sands based on the D_{10} size. $K_{cm/sec} = D_{10} \times C$. The factor C can range from 40 to 150; however, a default value of 100 is commonly used. The D_{10} size of the sand was 0.28 mm. This method yielded the following results.

C	K (cm/sec)	K (ft/min)
40	3×10^{-2}	85
100	8×10^{-2}	226
150	1.2×10^{-1}	340

It is clear that unless something during the construction of the PRW reduced the hydraulic conductivity of the backfill, it should be much more conductive than the formation.

The orientation of the PRW relative to the potentiometric contours should have been a primary design consideration. However, this factor is either a commonly overlooked aspect of design or the potential effects are not well understood by many.

5.3 Plume Flux

It is helpful to have an understanding of the plume flux that is either passing through or might be bypassing the PRW. It is obvious from inspection of potentiometric surface maps from before and after construction of the PRW that the gradient approaching the PRW changed. Since hydraulic conductivity is a formation property and the cross-sectional area of the PRW at the downgradient face is essentially the same, the apparent flux through the PRW is directly proportional to the gradient. Comparisons were made using the August 1999 data and the December 2001 data. Both of these representations indicate that nearly the full plume width passes through the PRW.

Pertinent Parameters

Design Hydraulic Conductivity (K) = 1.87 ft/day
PRW Cross-Sectional Area (A) = 15,150 ft^2
One cubic foot = 7.48 gallons
August 1999 gradient (i) = .027
December 2001 gradient (i) = .015

Pre-Construction Flux

$Q = KiA \times 7.48\ g/ft^3$

$= 1.87\ ft/day \times .027 \times 15{,}150\ ft^2 \times 7.48\ g/ft^3/1440\ min/day = 3.97\ gpm$

Post-Construction Flux

$Q = 1.87\ ft/day \times .015 \times 15{,}150\ ft^2 \times 7.48\ g/ft^3/1440\ min/day = 2.2\ gpm$

It should be noted that groundwater level elevations from wells along Buckner Road should not be used to calculate the gradient in the vicinity of the PRW since those wells are in the paleovalley and are not representative of water levels associated with flow from the uplands. Therefore, only water level data from the PRW alignment and upgradient were used for this analysis.

The recently available potentiometric map constructed using the April 2002 water level data includes data from the recently installed L-Series wells. It suggests that much of plume that passed through the plane of the PRW prior to PRW construction bypasses the PRW. The plume bypass is a major difference from the map prepared from the December 2001 data. It indicates that the post-construction flux calculation above is an overestimation. This is discussed in greater detail in Section 5.4.

5.4 Detailed Potentiometric Maps Utilizing April 2002 Water Level Data

5.4.1 General

Groundwater level data from the new L-Series wells and from the pump tests aided considerably in defining the post-construction potentiometric surface. Note especially the change in shape of the shallow zone contours in Figure 5-2 (April 2002) compared to the contours in Figure 5-3 (December 2001). The April 2002 deep zone contours (Figure 5-4) also shows a bit more indication of bypass flow than do the December 2001 contours (Figure 5-5).

In order to better understand the flow into, through, and around the PRW; detail potentiometric maps were constructed. It was felt this level of detail was needed in order to effectively evaluate the performance of the PRW. The detailed potentiometric maps were prepared at a scale of 1"=8' and are comprised of a series of overlapping maps for each zone. The shallow zone map is shown in Figures 5-6a through 5-6e and the deep zone map is in Figures 5-7a through 5-7e. Note that the maps do not extend very far upgradient or downgradient. The details of what the maps show are discussed below.

5.4.2 Shallow Potentiometric Surface Map

The water level in the PRW is 5 to 10 feet higher than the August 1999 pre-construction water level. It is also important to note the apparent gradient along the length of the PRW and the fact that the highest water level elevation occurs in a short reach northeast of PW-2. The in-trench gradient southwestward from the high is approximately 0.014 and approximately 0.02 northeastward from the high.

The apparent gradient along the length of the PRW indicates that hydraulic conductivity of the PRW backfill might not be much higher than the hydraulic conductivity of the formation. It might also indicate that the hydraulic conductivity of the backfill is variable along the length of the PRW.

The groundwater contours indicate that there is groundwater flow around both ends of the PRW. However, there is not enough data to allow definition of the portion of the total plume that is bypassing.

Note how the groundwater contours bulge downgradient around CW-5S. The water levels have always been anomalously high in this well. The boring log shows that sand/iron backfill was encountered in the boring. This well appears to be in hydraulic communication with the PRW. The well is likely completed at least partially in PRW backfill and the water level in the well is an in trench water level.

There is a very steep gradient immediately downgradient of the PRW. The total amount of head loss is not known since it is not known whether the downgradient compliance wells are beyond the limits of the steep gradient associated with the PRW.

5.4.3 Deep Potentiometric Surface Map

The water level elevations in the deep wells in the PRW in April 2002 were 6 to 14 feet higher than the August 1999 pre-construction water level elevations. The smallest difference occurs at the northeast end of the PRW and the greatest is midway between PW-1 and PW-2. The highest water level elevation occurs in the reach beginning midway between PW-1 and PW-2 and extending to the vicinity of PW-3. The apparent gradients along the PRW are 0.014 to the southwest of the high and 0.023 to the northeast of the high. The gradients are very similar to those noted in the shallow zone.

There is apparent flow out of the upgradient side of the PRW from the southwest end to the vicinity of PW-3. This is approximately the southwestern 300 feet of the nearly 450 foot length of the PRW. The basis of this very critical interpretation is the fact that the water level elevations in the deep wells upgradient of PW-1, PW-2, and PW-3 have been lower than the water level elevations in the corresponding PW wells for most of the time since May 2001.

The map contours also indicate that there is bypass flow around both ends of the PRW and that the PRW is acting as a hydraulic barrier for approximately 60 percent of its length. The current deep zone flow pattern is similar to the flow pattern that was projected in Section 5.1 to result from the construction of the PRW at its current location.

5.5 Hydraulic Conclusions

The flow pattern suggests that flow in and around the PRW is strongly influenced by the orientation of the PRW to the pre-construction flow field. However, the resulting post-construction flow field is apparently modified by both skin effects and the hydraulic conductivity of the PRW backfill. These issues will be discussed further in later sections.

The monitoring program was obviously laid out based on the concept that groundwater flow to, through, and out of the PRW is normal to the alignment of the PRW. The sample flow lines on Figures 5-6a through 5-6e and 5-7a through 5-7e clearly show how this presumption will lead to erroneous conclusions regarding the performance of the PRW. This issue is discussed in more detail later in this report. Both the groundwater velocities in the bypass regions and the lengths of the bypass flow paths should be considered in future monitoring.

6 CHEMICAL DATA

6.1 General

The chemical data alone don't demonstrate how effectively the PRW is degrading the chlorinated hydrocarbons that are entering the PRW. The chemical data must be evaluated along with the hydraulic data. This is illustrated in Figures 5-6a through 5-6e and Figure 5-7a through 5-7e where it is shown that flow lines passing through upgradient compliance wells might not pass through either the corresponding performance well or the downgradient compliance well.

The highest VOC concentrations detected prior to construction were detected at the MW16-22, MW16-23, and MW16-24 cluster near the current performance monitoring well PW-3. The contamination increased with depth at this location. The current upgradient compliance wells nearest that location, CW-6S and CW-6D, display moderate concentrations in CW-6S and low concentrations in CW-6D. The highest concentrations along the PRW alignment are now detected in CW-4D. It appears that there are too few data points to clearly define the plume. The data suggest that there might be multiple narrow plumes rather one wide plume. In order to move forward with the remediation of the groundwater, it is important to understand the plume dimensions.

6.2 Chlorinated Hydrocarbon Data

The organic chemical concentration data are shown on Tables 6-1a through 6-1d. The following observations were made for each of the monitoring transects.

- **CW-2S, PW-1S, CW-3S** – Cis-1,2-DCE, TCE, and PCE were detected at relatively low concentrations in both the upgradient and downgradient wells and were not detected in PW-1S. The upgradient and downgradient concentrations were of similar magnitude in all of the sampling events. The TCE and PCE concentrations do, however, appear to be decreasing with time.

- **CW-3D, PW-1D, CW-3D** – Very little contamination was detected in any of these wells. However, it should be noted that benzene was detected below the MCL in both PW-1D and CW-3D in all of the sampling events but has not been detected in the upgradient well. Benzene is not affected by the zero valent iron. If the wells were all along the same flow line, benzene should also be detected in the upgradient well.

- **CW-4S, PW-2S, CW-5S** – All of the upgradient concentrations were below their respective MCLs. Vinyl chloride exceeded the MCL in PW-2S for the first two quarters then declined to nondetect thereafter. Chlorinated hydrocarbons have not been detected in CW-5S. Note that the water level data and boring log

descriptions suggest that CW-5S is at least partially completed in the PRW backfill.

- **CW-4D, PW-2D, CW-5D** – The upgradient well, CW-4D, has had the highest VOC concentrations of any of the compliance wells. PW-2D has had only scattered minor VOC detections. Vinyl chloride is the only VOC to have exceeded the MCLs in CW-5D and this was only in the first two quarters of monitoring. Note that TCE influent concentrations are clearly higher than at any of the other transects and yet there was no TCE detected in either the performance well or the downgradient compliance well. If these wells were on the same flow line, these data would raise questions about whether downgradient contaminant detections might be due to desorbtion from previously contaminated aquifer material.

- **CW-6S, PW-3S, CW-7S** – There are two notable observations at this set of wells. The first is the fact that the upgradient TCE concentration has steadily decreased from 60.8 ug/l in April 2001 to nondetect in April 2002. The second is that, like the CW-2D, PW-1D, CW-3D transect, benzene has been persistent in the downgradient well and the PRW well but is absent in the upgradient well.

- **CW-6D, PW-3D, CW-7D** - The upgradient detections have been mainly cis-1,2-DCE below the MCL and TCE at less than 20 ug/l but the concentrations have been increasing with time. It is important to note that during the first three quarters, cis-1,2-DCE and TCE were at much higher concentrations in CW-7D than in upgradient well CW-6D and that vinyl chloride exceeded the MCL in CW-7D. It was not detected in either the upgradient well or in PW-3D. Generally all of the above discussed compounds increased during the first three quarters of monitoring in CW-7D and have since decreased to nondetect in the April 2002 sampling event

- **CW-10S, PW-4S, CW8S** – The lack of an upgradient well at this transect during the first three quarters of sampling makes it difficult to evaluate trends. However, cis-1,2-DCE and TCE were detected at moderate levels during the last two sampling events. Nondetections were prevalent for PW-4S. However, TCE was detected in CW-8S above the MCL during the first three quarters. But the concentration has been below the MCL in the last two quarters.

- **CW-10D, PW-4D, CW-8D** – This transect also has a short upgradient record. Moderately high concentrations of TCE and cis-1,2-DCE concentrations below the MCL have been detected in both quarters of CW-10D sampling. No VOCs have been detected in PW-4D above MCLs. TCE was detected above the MCL during the first three quarters in CW-8D and vinyl chloride was detected in the last two quarters. Vinyl chloride exceeded the MCL in the fourth quarter and was slightly below the MCL in the fifth quarter.

- **Southwest End** – There have been very few detections of VOCs in either CW-1S or in CW-1D and none exceeded the MCLs.

- **Northeast End** – Cis-1,2-DCE and TCE have been detected in both CW-9S and CW-9D in all of the quarterly sampling events. The MCL for cis-1,2-DCE has been exceeded in only CW-9D. No trend could be discerned to indicate that plume bypass is the cause of the VOCs in this area or whether they were present prior to construction of the PRW. The necessary pre-construction plume definition and detailed flow pattern for this area are not available to make this determination.

6.3 Dissolved Oxygen (DO) and ORP Data

The most significant observation regarding DO and ORP is the fact that DO and ORP are low in upgradient wells CW-2D, CW-4S, CW-4D, and CW-6D. This observation supports the detailed potentiometric maps, prepared using the water level elevation data, that suggest that there is flow out of the upgradient side of the PRW in the deep zone in the area in which these deep zone wells are located. The limited data from areas unaffected by the PRW suggest that the ORP and DO concentrations were much higher and the groundwater was generally aerobic. The low DO and ORP in upgradient wells indicates flow of anaerobic water from the PRW. The ORP and flow data also suggest possible shallow zone flow from the upgradient side of the PRW in the vicinity of CW-4S and PW-2S.

Both the DO and ORP values are lower than anticipated in CW-1D at the southwest end of the PRW. The deep zone detailed potentiometric map suggests that flow might be exiting the end of the PRW and this could account for the low DO and ORP.

6.4 Chemical Data Conclusions

In spite of the questions about whether the upgradient and downgradient compliance wells are monitoring groundwater that is traveling along the same flow path, chemical data from the PW monitoring wells indicate that the PRW is effectively degrading the chlorinated hydrocarbons that are entering the PRW. Except for two vinyl chloride detections above the MCL in the first two quarters of monitoring in PW-2S, no chlorinated hydrocarbons have been detected above MCLs in the wells in the PRW. However, these data do not provide assurance that the PRW would be effective if the PRW had not lost hydraulic efficiency due to non-chemical reasons.

Both the DO/ORP data and the groundwater level data indicate that the PRW has altered groundwater flow to, through, and out of the PRW. As a result, the groundwater passing through the intended upgradient well is not along the same flow path as the groundwater passing through either the corresponding performance well or the downgradient compliance well. Therefore, the effectiveness of the PRW to chemically degrade the

chlorinated hydrocarbons can not yet be determined solely on the basis of the chemical data.

Better definition of the vertical and lateral extent of the plume upgradient of the PRW, around the PRW, and whether there are one or multiple plumes is needed to complete the remediation of the groundwater problem in an efficient and cost effective manner.

7 PUMP TESTS

7.1 General

The pump tests provided additional valuable information for the evaluation of the PRW. Static water level elevations, pump test drawdown data from the PW-1D, PW-3D, and PW-4D tests; and the slug test results were used in this evaluation of PRW performance. The drawdown data were analyzed using the Jacob straight line method. The calculated aquifer parameters should not be considered precise since so many of the assumptions for pump test analysis were violated. However, they can be considered as semi-quantitative and are good relative values for the evaluation.

7.2 Static Water Level Data

Both the static water level elevations and the water level elevations recorded near the end of the PW-1D and PW-4D pump tests were analyzed. Figures 7-1 through 7-4 are water level elevation profiles along the length of the PRW, upgradient of the PRW, along the CW-2, PW-1, CW-3 transect, and along the CW-4, PW-2, CW-5 transect respectively, from the PW-1D pump test. Figures 7-5 through 7-7 are water level elevation profiles along the length of the PRW, upgradient of the PRW, and along the CW-10, PW-4, CW-8 transect respectively, from the PW-4D test.

Figure 7-1 provides a number of insights into the character of the PRW. It should be noted that the apparent anomalous water level elevations in PZL-14S, PZL-16D, PZL-18S, and PZL-20D are likely due to a surveying discrepancy. The static groundwater elevations in the piezometers have ranged from 0.5 to 1.0 foot lower than the static groundwater elevation in the nearby shallow or deep performance well over the four quarters of water level measurements since they were installed.

Wells	Differential in Feet
PW-1S/ PZL-14S	0.67 – 0.88
PW-1D/PZL-16D	0.50 – 0.72
PW-3S/PZL-18S	0.82 – 0.98
PW-3D/PZL-20D	0.68 – 0.79

The static water level along the length of the PRW is neither flat nor nearly flat as would be expected. The approximate three foot difference in static groundwater elevation along the length of the PRW indicates that the rather low hydraulic conductivity of the sand/iron backfill has affected the hydraulic effects of the pre-construction groundwater elevation differential along the alignment of the PRW. If the backfill material were in the 100 to 300 feet/day range, the water level elevation in the PRW would be expected to be nearly flat.

The water level elevation profiles in the PRW (Figure 7-1 and 7-5) were compared to the upgradient water level elevation profiles (Figures 7-2 and 7-6) for each test. The profiles

for the PW-1D test show greater drawdown in the upgradient wells than in the PW wells at comparable distances from the pumping well. This suggests that hydraulic conductivity of the formation is either greater than the conductivity of the PRW backfill in the vicinity of PW-1D and/or the formation has less lateral hydraulic conductivity variability than the backfill. The transect at PW-2 (Figure 7-4) also shows that the drawdown in the formation is greater than in the PRW. The drawdown in the PRW also suggests that the transmissivity of the PRW backfill increases at a point northeast of PW-2.

The fact that the pumping rates for the pump tests were 1.1 gpm, 3 gpm, and 4 gpm respectively for PW-1D, PW-3D, and PW-4D also indicates that the PRW backfill is considerably more conductive at PW-3D and PW-4D than at PW-1D. Figures 7-8 and 7-9 are distance-drawdown plots for the PW-1D and PW-4D pump tests respectively. The transmissivity (T) was estimated at 17 ft^2/day for W-1D test and between 67 ft^2/day and 120 ft^2/day for the PW-4D test. It is important to note that the formation saturated thickness and saturated vertical height of the PRW is approximately 50 feet at PW-1D and is approximately 30 feet at PW-3D and at PW-4D. Transmissivity is defined as hydraulic conductivity times saturated thickness of the aquifer. Therefore, the distance – drawdown data suggest that the average hydraulic conductivity near PW-1D is approximately 8 to 15 percent of the hydraulic conductivity at PW-4D. The estimated hydraulic conductivity values from the PW-1D and PW-4D distance-drawdown data are 0.34 ft/day for PW-1D and between 2.2 and 4 feet/day for PW-4D.

The very high drawdown measured in CW-2D and CW-3D (Figure 7-3) relative to the drawdown in the PRW indicates that little drawdown in PW-1D was due to well losses and that the groundwater level in the PRW drew down to close to the level in PW-1D across the full width of the PRW at that location. In effect, the formation responded to the drawdown in the PRW as if the PRW were the well.

The water level data from the PW-4D pump test show markedly different relationships from those in the PW-1D test. Examination of Figures 7-5 and 7-6 show that during the PW-4D test, the drawdown in the PRW wells was consistently greater than the drawdown in the formation at comparable distances from the pumping well. The transect through PW-4D shows that even though the drawdown at PW-4D is slightly greater than the maximum drawdown at PW-1D, the upgradient drawdown is approximately one foot and the downgradient is slightly less than four feet. This might be attributed to the fact that well losses at PW-4D were significant at PW-4D. The distance-drawdown plot (Figure 7-9) indicates that the better fit is the line with a $\Delta s = 2.35$ feet. This plot indicates that the actual drawdown in the PRW at PW-4D was approximately 4 feet. The data also suggest that the hydraulic conductivity of the PRW backfill at this location is greater than that of the formation.

7.3 Drawdown Data

In addition to the distance-drawdown plots for the PW-1D and PW-4D pump tests, time-drawdown plots were prepared for PW-1D, PW-3D, and PW-4D pump tests. See Figures 7-10 through 7-34. This was done while recognizing that many of the assumptions for pump test analyses were violated. These assumptions include; the aquifer is homogeneous and isotropic, is of infinite extent, and has constant thickness and negligible slope. However, the analyses provided semi-qualitative values that helped understand the character of the PRW and the interaction of the PRW and the formation.

The estimates of hydraulic conductivity (K) from the time-drawdown analyses are listed below together with the slug test hydraulic conductivity values, in feet/day, that were done as part of the pump test investigation.

PW-1D PUMP TEST					
Upgradient Wells Wells		**PRW Wells**		**Downgradient**	
Well	**K Pump/Slug**	**Well**	**K Pump/Slug**	**Well**	**K Pump/Slug**
CW-1D	0.73/1.22	PW-1S	0.19/6.90	CW-3S	----/0.49
CW-2D	0.23/0.15	PZL-14S	0.22/---	CW-3D	0.23/0.052
*CW-4D	0.68/1.83	PZL-16D	0.23/---		
		*PW-2D	1.94/0.24		
PW-3D PUMP TEST					
*CW-6S	8.00/1.24	PW-3S	1.16/43.94	CW-7S	1.14/0.046
CW-6D	0.92/1.37	PW-4D	----/9.8	CW-7D	1.45/6.51
		PZL-18S	1.40/---		
		PZL-20D	1.07/---		
		*PW-2D	0.55/0.24		
PW-4D PUMP TEST					
*CW-10S	31.8/2.5	PW-4S	3.64/20.9	CW-8S	11.28/0.50
CW-10D	9.47/0.68			CW-8D	2.12/0.76

* indicates the wells from which the data were rather weak for aquifer analysis.

As can be seen in the table, the apparent hydraulic conductivity seems to be related more to the location along the length of the PRW than whether the well is located in the PRW or in the natural formation. The author concluded that the pump test hydraulic

conductivity is more representative of the hydraulic conductivity of the PRW backfill than by the hydraulic conductivity at the well location for those wells located outside of the PRW. This is due to the fact that the PRW has such different hydraulic parameters than the formation especially near PW-3 and PW-4 and to the geometry of the PRW.

Nearly all of the time-drawdown plots contained a straight line portion which could be used to calculate T and a storage coefficient (S). However, most of the plots deviated from a straight line at some point. These deviations are thought to indicate lateral variations in T. Plots from the PW-1D test generally deviated from a straight line at approximately 2,000 minutes after the start of pumping. Deviations from a straight line occurred at from 500 to 600 minutes in both the PW-3D and PW-4D pumping test plots.

In some cases the deviation was from a straight line to an apparent curved segment. In several of the PW-3D records, the change was to a much flatter slope which then steepened at a later time. In the PW-4D plots, what appeared to be a recovery episode was apparent. Several of the PW-3D plots show a distinct break that has the appearance of a recharge boundary or a lateral change to a significantly more transmissive material. The image well method was used in an attempt to estimate where the change occurred. The method is not precise when using the Jacob straight line plots (Heath, 1983) and it should be recognized that the deviations were not due to true recharge boundaries. However, the results are interesting and useful for the evaluation. The calculated distances to the change are as follows.

APPROXIMATE DISTANCES TO CHANGE

Well Number	Distance in Feet
PW-3S	23
CW-6D	44
CW-7S	21
CW-7D	21
PZL-18S	4
PZL-20D	54

Even though the boundary could not be located precisely, it is clear that it does represent a significant increase in T that occurs in the PRW somewhere between PW-3D and PW-4D. The change is closer to PW-3D than to PW-4D. No analysis was made of other apparent boundaries on the time-drawdown plots.

7.4 Pump Test Conclusions

The pump test data did not provide information on the low hydraulic conductivity skin along the PRW walls. Analysis of the pump test data indicates that the PRW backfill is less conductive than the sand/iron mix used to backfill the PRW. The conductivity is highest in the northeastern portion of the PRW. The major change in conductivity occurs in the vicinity of PW-2. The less conductive southwestern portion of the PRW generally corresponds with the reach in which major wall failure occurred and had to be

reexcavated. The slurry viscosity was also greater in this reach. The more viscous slurry would tend to entrain more formation fines. It is also in this reach that the PRW is deepest. Therefore, the sand/iron backfill would have greater opportunity to segregate during placement.

8 CONCLUSIONS

8.1 General Conclusions

The following conclusions have been drawn about the PRW based on a review of the available data.

- A significant but unknown portion of the plume is bypassing the PRW. The flow pattern that has developed since the PRW was constructed is complex.

- The chlorinated hydrocarbon contamination in the portion of the plume that is currently passing through the PRW appears to be degrading to below MCLs.

- There are three major causes of the plume bypass.
    - The PRW is not aligned parallel to the pre-construction equipotential contours.
    - The hydraulic conductivity of the PRW backfill is low and varies laterally.
    - There is a low conductivity skin at the PRW trench walls.

- Limited pre-design investigation and delayed implementation of the performance monitoring program (PW and CW wells) have hindered timely recognition of the performance problems and understanding the causes and effects of the bypass.

- The wells in the in the CW-PW transects are not located along flow lines due to the flow redistribution.

- The end stop and clay sliver near the location of PW-2 has little effect on the performance of the PRW.

- Non-chemical PRW deficiencies overshadowed the question of the effective life of the PRW. Therefore, it was not evaluated.

8.2 Plume Bypass

The detailed potentiometric maps developed from the most complete set of groundwater elevation data as well, the geochemical data and the chemical analytical results all indicate that much of the groundwater that passed through the plane of the PRW prior to PRW construction now bypasses the PRW. The lack of adequate pre-design hydrologic and chemical data limit our understanding of the extent of bypass and whether the contamination at the northeast end of the PRW has occurred since PRW construction or the plume extended beyond the northeast limit of the PRW prior to construction.

8.3 Causes of Plume Bypass

8.3.1 PRW Alignment

The pre-design groundwater level elevation data clearly show that there was a significant water level difference along the length of the PRW. This factor alone would have caused a portion the PRW to act as a hydraulic barrier. The reason is that the hydraulic conductivity of the iron/sand PRW backfill would have been much higher than the hydraulic conductivity of the formation. Therefore, the resulting groundwater level in the PRW should have been nearly flat from one end to the other and at a level somewhere between the highest and lowest upgradient levels. As a result the portion of PRW with a level higher than the immediate upgradient level would act as a hydraulic barrier to flow with flow out of both the upgradient and downgradient sides of the PRW.

8.3.2 Low and Variable PRW Backfill Hydraulic Conductivity

The post-construction boring log descriptions, groundwater level elevation data, and the analysis of the pump test data indicate that the PRW backfill has a much lower hydraulic conductivity than the hydraulic conductivity of the sand/iron mix specified for backfill. These same data also provide evidence of significant lateral variability in hydraulic conductivity along the length of the PRW. These two factors have acted to modify the effects of the alignment relative to the equipotential lines. The low hydraulic conductivity also affects the groundwater flux that can pass through the PRW under the formation gradient. The evaluator feels that the conductivity reduction is due to backfill segregation, fines entrained in the polymer slurry and the possibility that air was also trapped in the sand/iron backfill. These problems could have been avoided if the iron/sand backfill had been tremied into the polymer slurry filled trench together with water that was added at the top of the tremie pipe. The displacement method of backfill placement would not prevent any of the conductivity reducing factors.

8.3.3 Presence of a Low Conductivity Skin

The groundwater level elevation data show that there is a low hydraulic conductivity skin at both the upgradient and downgradient of the PRW trench. The upgradient head differential could have possibly been attributed to the low conductivity of the PRW backfill. However, the downgradient differential can only be attributed to a skin that is less conductive than either the PRW backfill or the downgradient formation. After careful consideration of the properties of the formation and of the construction details, the author is of the opinion that the skin resulted primarily from migration of slurry fines into the trench walls. Since the water level in the trench was higher than the water level in the formation. The sediment laden slurry tries to move out of the trench and into the trench walls. The total head differential was compounded by the density of the slurry.

8.4 Limited Pre-Design Investigation and Timing of Performance Monitoring

The pre-design investigation did not appear to have defined the lateral or vertical extent of the plume in enough detail to optimize the length of the PRW or to provide enough data to readily evaluate the potential consequences of less than optimal PRW performance. Additional pre-design groundwater level and chemical data would have provided what is now known to be vital information about whether VOC contaminated groundwater was flowing beyond the northeast end of the PRW prior to construction of the PRW. A more detailed investigation would have also shown whether groundwater was discharging to the ditch near the northeast end prior to PRW construction.

The delay in installing and monitoring the performance monitoring system was far too long. Had the system been installed at the time of or very shortly after completion of PRW construction, the groundwater level data would have shown that flow redistribution was occurring long before chemical sampling would have indicated a potential problem. As it is, there is still considerable uncertainty as to whether the VOC contamination is due to flow redistribution and bypass or whether it was a pre-existing condition. All of the post-construction groundwater level data collected to date or to be collected in the future will only define the current flow system and will not provide the details of the pre-design flow pattern. The lack of these data will complicate further remedial actions.

8.5 End Stop and Clay Sliver

While the presence of the end stop and the clay sliver are not accommodated in the design and are considered violation of the specifications, it is unlikely that they are the cause of any significant PRW malfunction. If anything they constitute a low conductivity zone in a section of the PRW that might be only marginally more conductive. Any contaminated groundwater entering the area of the stop and the sliver would tend to flow around this combined obstacle. Considering the apparent very low flux into the PRW, any flow around the stop and sliver would be at a very low velocity and would not likely escape treatment. The larger PRW bypass and flow redistribution should be addressed before pursuing the stop and sliver area. If after the remedial measures are completed, the stop and sliver area could be reevaluated.

8.6 PRW Reactive Life

There is too little reliable data to estimate the potential life of the PRW. There have been no documented cases of failure of a PRB due to loss of reactivity. The oldest PRB installations have been in operation for approximately 7 years. The hydraulic and physical problems at the LCAAP PRW overshadow the chemical performance.

9 RECOMMENDATIONS

9.1 General

This section makes recommendations regarding if and how the PRW can be modified to passively treat the VOC plume without allowing plume bypass or either upgradient or sidegradient groundwater discharge to the ground surface. Recommendations are also made concerning additional site investigations needed to evaluate and remediate the problems that resulted from construction of the PRW.

9.2 PRW Modification

Several important factors are responsible for the groundwater flow redistribution and plume bypass resulting from construction of the PRW. All of the factors have contributed to the current condition. All of the three aspects must be fully understood in order to attempt a PRW remedial action.

It might be possible to redirect the plume flow through the PRW. However, this would require considerable additional site characterization and the use of a carefully calibrated and realistic computer model. The model would be used to evaluate candidate methods of redirecting the flow. Based on experience at other sites, the use of subsurface training walls (sheet pile or soil-bentonite slurry walls) would probably considered. The length of the barriers could be expected to be rather long considering the amount of groundwater elevation difference that was reported in the pre-design data.

If the groundwater flow was redirected, it would result in a very large increase in the flux through the PRW compared to the flux currently passing through the PRW. Considering the head differentials currently needed to drive the present flux through the PRW, it is almost certain that the remedial flow redirection would exacerbate the upgradient groundwater level problems. Upgradient discharge would be expected and the area of discharge would grow. The author doubts that the low conductivity skin on either the upgradient walls of the PRW can be removed or repaired. Significant improvement in the hydraulic conductivity of the wall would be needed in order to reduce or eliminate the upgradient mounding.

If the skin hydraulic conductivity could be greatly improved, the apparent low conductivity of the portion of the PRW backfill southwest of approximately PW-2 would possibly still cause some upgradient mounding. If the flow could be redistributed back through he PRW and the skin conductivity could be increased, the apparent non-uniform iron distribution and vertically variable sand size in the PRW backfill raises questions about whether the PRW would effectively treat the higher plume flux.

It is unlikely that an economical and effective modification of the PRW that guaranteed total plume capture and treatment is possible. However, it is considered potentially more feasible to allow the as-constructed PRW to treat the flux that is now passing through and

to supplement the PRW with one or more remedial add-ons to capture and treat the bypass plume flow. It might also be possible to construct upgradient lateral collection trenches that direct the plume into iron filled gates constructed through the existing PRW. It is possible that trenches and gates would not have to extend to bedrock.

Before any of the above remedies could be seriously evaluated, considerable additional site characterization is needed to define the problem in detail. It might be wise to conduct a study using 'Value Engineering' methods. The team would be comprised of a number of technical experts and the stakeholders. Selection of a qualified facilitator is required in this very effective means of solving difficult problems.

9.3 Additional Site Investigations

It must be recognized that the current groundwater flow pattern at the site is different than the flow pattern prior to construction of the PRW and that the plume shape and dimensions is likely changing at various rates in response to the new flow regime. The current flow pattern will change little if any unless it is further modified. However, the contaminant pattern should continue to change for some unknown time into the future. Once the flow pattern is characterized, then predictions of the resulting plume configuration(s) can be made. The chemical data would be used primarily to estimate the nature and extent of the pre-construction plume, whether there were one or multiple plumes, and to locate the sources of the groundwater contamination plume(s).The following are three major goals of the additional investigations.

- Collect enough chemical data to define the lateral and vertical limits of the contaminated groundwater plume and to determine whether there are one or multiple plumes.
- Collect enough water level data to define the current potentiometric surface and groundwater flow pattern.
- Determine the effect of the ditch on groundwater flow and contaminant migration in the vicinity of the northeast end of the PRW.

9.3.1 Chemical Data for Plume Definition

If the chemical investigation was accomplished prior to the installation of the monitoring wells/piezometers, the results would be available for modifying the locations of the wells. It is suggested that the groundwater samples needed for plume definition be obtained using direct push methods. Figure 9-1 shows two rows of 10 soundings each. It is recommended that groundwater samples be collected every 10 feet. The Geoprobe™ DT-21 Groundwater Profiler should be investigated as a cost effective means of taking samples from multiple depths without having to pull the outer rods between samples. It is further suggested that an additional optional 5 to 8 soundings be considered. They would be utilized if the data from the original 20 soundings indicates a need.

The use of on-site analysis of the groundwater samples would add flexibility to the investigation. The results would aid in optimizing the placement of subsequent soundings and for determining the need for the optional soundings while the rig is still mobilized.

9.3.2 Potentiometric Surface Definition

Figure 9-2 shows suggested locations for monitoring wells or piezometers for the detailed definition of the potentiometric surface in the vicinity of the PRW. The suggested investigation includes:

- 3 shallow zone wells
- 7 deep zone wells
- 6 – 2 well clusters (shallow and deep)
- 8 – 3 well clusters (shallow, intermediate, and deep)

The program includes 46 wells at 24 locations. The well locations have been selected to provide definition of:

- the extent of plume bypass
- upgradient head distribution
- the amount of bypass that is likely discharging to the ditch
- whether there is flow to the ditch from the east side
- whether contaminated groundwater is discharging to the ditch from the east side and
- the gradient on the downgradient side of the PRW

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Table 6-12

Table 6b
Summary of Groundwater and Surface Water Organic Chemistry (sorted by transects)
Permeable Reactive Wall, Interim Remedial Action, NECOU

Location	Analyte	Total Volatiles	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,2-Dichloroethane	2-Butanone (MEK)	2-Hexanone	4-Methyl-2-pentanone	Acetone	Benzene	Bromochloromethane	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Ethylbenzene	m-Xylene and p-Xylene	Naphthalene	o-Xylene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Dissolved Organic Carbon
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
	Remediation Goals	--	200	5	--	7	--	5	--	--	--	--	5	--	--	--	100	--	70	--	700	--	--	--	5	1000	100	5	2	--
	DATE COLLECTED																													
CW1S	03/21/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7
CW1S	07/09/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.7
CW1S	09/24/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.5
CW1S	12/11/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.63
CW1S	04/16/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.2
CW1D	03/14/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.8
CW1D	07/09/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.8
CW1D	09/25/01	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.24	19.3
CW1D	12/11/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6
CW1D	04/16/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.04
CW2S	04/04/01	43.96	1.55	ND	0.68	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.96	ND	ND	ND	ND	ND	7.17	ND	ND	28.3	ND	1.3
CW2S	07/17/01	31.25	1.09	ND	0.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.45	ND	ND	ND	ND	ND	6.05	ND	ND	18.2	ND	1.2
CW2S	09/24/01	24.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.47	ND	ND	ND	ND	ND	4.23	ND	ND	14.5	ND	16.8
CW2S	12/17/01	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.6	ND	ND	ND	ND	ND	0.62	ND	ND	5.78	ND	2.21
CW2S	04/16/02	17.7	0.62	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.27	ND	ND	ND	ND	ND	3.17	ND	ND	7.64	ND	2.26
PW1S	04/04/01	73.68	ND	ND	ND	ND	ND	ND	29.7	ND	ND	42.7	1.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	180
PW1S	07/10/01	5.23	ND	ND	ND	ND	ND	ND	3.99	ND	ND	ND	1.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	88
PW1S	09/21/01	1.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.74	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	69.9
PW1S	12/26/01	12.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.7	1.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	37
PW1S	04/30/02	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.5
CW3S	04/03/01	35.3	0.93	ND	0.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.46	0.62	2.56	ND	ND	ND	ND	ND	2.55	ND	ND	27.6	ND	1.8
CW3S	07/12/01	25.89	0.64	ND	0.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.28	ND	ND	ND	ND	ND	2.65	ND	ND	21	ND	1.6
CW3S	09/24/01	11.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.62	ND	ND	9.53	ND	20
CW3S	12/17/01	29.41	0.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.15	ND	ND	ND	ND	ND	3.34	ND	ND	23.4	ND	3.08
CW3S	04/25/02	10.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.43	ND	ND	ND	ND	ND	ND	ND	ND	6.84	ND	4.95
CW2D	03/21/01	197.16	ND	ND	ND	ND	ND	ND	118	ND	1.18	74.6	0.87	ND	ND	0.68	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND	1.23	ND	90
CW2D	07/17/01	2.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.35	ND	ND	ND	0.95	ND	ND	ND	0.33	ND	ND	0.35	ND	0.98	ND	1.3
CW2D	09/24/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16.9
CW2D	12/14/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9
CW2D	04/16/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8
PW1D	04/04/01	10.83	ND	ND	ND	ND	ND	ND	9.37	ND	ND	ND	1.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190
PW1D	07/10/01	1.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	95
PW1D	09/21/01	1.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	65.6
PW1D	12/26/01	1.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32.3
PW1D	04/30/02	1.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.88	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23.1
CW3D	04/03/01	139.84	ND	ND	ND	ND	ND	ND	88.9	2.04	3.87	40.8	2.92	ND	0.39	ND	ND	0.92	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	163
CW3D	07/12/01	17.16	ND	ND	ND	ND	ND	ND	10.9	ND	3.57	ND	1.25	ND	0.63	ND	ND	ND	ND	ND	ND	ND	0.37	ND	ND	0.44	ND	ND	ND	21.7
CW3D	09/21/01	17.31	ND	ND	ND	ND	ND	ND	10.9	ND	3.57	ND	1.4	ND	0.63	ND	ND	ND	ND	ND	ND	ND	0.37	ND	ND	0.44	ND	ND	ND	20.1
CW3D	12/17/01	3.88	ND	ND	ND	ND	ND	ND	ND	ND	2.1	ND	1.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54	ND	ND	ND	7.08
CW3D	04/25/02	1.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.9
CW4S	04/05/01	29.21	ND	ND	0.52	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.89	24.2	ND	ND	ND	ND	ND	ND	ND	0.78	2.38	0.44	1.9
CW4S	07/17/01	16.39	ND	ND	0.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.26	ND	ND	ND	14.8	ND	ND	ND	ND	ND	ND	ND	0.95	ND	ND	1.2
CW4S	09/25/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18.4
CW4S	12/13/01	14.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.5	ND	ND	ND	ND	ND	ND	ND	ND	1.92	ND	2.72
CW4S	04/23/02	12.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.6	ND	ND	ND	ND	ND	ND	ND	ND	1.19	0.99	1.97

Note: Only analytes detected in one or more samples are shown. ND = not detected. -- = not analyzed. Bold face result indicates remediation goal is exceeded. Field duplicates are indicated by sample ID shown in parentheses with well ID.

Table 6-1b

Table 6b
Summary of Groundwater and Surface Water Organic Chemistry (sorted by transects)
Permeable Reactive Wall, Interim Remedial Action, NECOU

Location	Analyte	Total Volatiles	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,2-Dichloroethane	2-Butanone (MEK)	2-Hexanone	4-Methyl-2-pentanone	Acetone	Benzene	Bromochloromethane	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Ethylbenzene	m-Xylene and p-Xylene	Naphthalene	o-Xylene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Dissolved Organic Carbon
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
	Remediation Goals	--	200	5	--	7	--	5	--	--	--	--	5	--	--	--	100	--	70	--	700	--	--	--	5	1000	100	5	2	--
	DATE COLLECTED																													
PW2S	04/05/01	13.18	ND	ND	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.72	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.98	1.9
PW2S	07/10/01	3.58	ND	ND	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.23	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.01	3.5
PW2S	09/20/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.1
PW2S	12/26/01	0.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.65	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.72
PW2S	04/23/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.01
CW5S	04/04/01	1.99	ND	ND	ND	ND	ND	ND	1.41	ND	ND	ND	0.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	37
CW5S	07/13/01	1.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.35	ND	ND	ND	28
CW5S	09/25/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.1
CW5S	12/13/01	1.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20.4
CW5S	04/23/02	0.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.1
CW4D	04/05/01	702.52	ND	0.35	9.06	4.88	ND	0.32	ND	ND	ND	ND	0.3	ND	ND	ND	ND	ND	148	1.05	ND	ND	ND	ND	1.97	ND	2.59	534	ND	1.4
CW4D	07/17/01	936.58	ND	0.49	13.9	5.68	ND	ND	ND	ND	ND	ND	0.37	ND	0.45	ND	ND	ND	202	1.81	ND	ND	ND	ND	4.33	ND	13.2	694	0.35	0.9
CW4D	09/26/01	438.38	ND	ND	10.9	6.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	95.6	ND	ND	ND	ND	ND	5.47	ND	4.93	315	ND	43.3
CW4D	12/13/01	756.62	ND	0.56	ND	5.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	227	1.07	1.04	ND	ND	ND	3.81	ND	2.53	515	ND	1.89
CW4D	04/17/02	1349	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	208	ND	ND	ND	ND	ND	ND	ND	ND	1141	ND	1.2
PW2D	04/05/01	10.77	ND	ND	ND	ND	ND	ND	4.36	ND	ND	5.44	0.63	ND	ND	ND	ND	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48
PW2D	07/10/01	9.38	ND	ND	ND	ND	ND	ND	3.21	ND	2.19	1.95	0.71	ND	ND	ND	ND	ND	ND	ND	ND	0.28	0.55	ND	ND	0.49	ND	ND	ND	48
PW2D	09/20/01	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	39.4
PW2D	12/27/01	3.22	ND	ND	ND	ND	ND	ND	3.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	24.4
PW2D	04/24/02	0.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.2
CW5D	04/05/01	68.42	ND	ND	0.79	0.52	ND	ND	4.22	ND	ND	ND	0.75	ND	3.2	0.34	ND	0.4	54.6	ND	ND	ND	ND	ND	ND	ND	0.61	0.32	2.67	7
CW5D	07/13/01	11.9	ND	ND	0.46	ND	ND	ND	ND	ND	ND	ND	0.54	ND	1.72	ND	ND	ND	1.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.06	1.9
CW5D	09/25/01	1.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.3
CW5D	12/13/01	17.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.73	ND	10.8	ND	ND	ND	1.25	ND	1.06	2.31	ND	1.11	ND	ND	ND	ND	0.63	9.42
CW5D	04/17/02	4.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.57	ND	ND	ND	ND	ND	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.24	3.37
MW16-2	04/09/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.8
MW16-2	07/18/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.7
MW16-2	10/01/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	21.4
MW16-2	12/28/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.3
MW16-2	05/02/02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.21
PZ-3	04/09/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1
PZ-3	07/18/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.9
PZ-3	10/01/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17
PZ-3	12/28/01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.76
PZ-3	05/02/02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.866
CW6S	04/02/01	131.11	0.6	ND	2.04	0.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.43	0.78	61.6	ND	ND	ND	ND	ND	1.22	ND	2.98	60.8	0.34	1.2
CW6S	07/16/01	97.51	0.43	ND	0.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.37	ND	46.6	ND	ND	ND	ND	ND	0.43	ND	0.97	47.2	0.57	1
CW6S	09/27/01	59.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35.5	ND	ND	ND	ND	ND	ND	ND	ND	23.7	ND	8.02
CW6S	12/12/01	42.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	34.3	ND	ND	ND	ND	ND	ND	ND	ND	7.1	0.65	4.25
CW6S	04/19/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.83
PW3S	03/26/01	1.19	ND	ND	0.45	ND	ND	ND	ND	ND	ND	ND	0.48	ND	ND	ND	ND	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.8
PW3S	07/11/01	1.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.51	ND	ND	ND	ND	0.55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.5
PW3S	09/20/01	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.82
PW3S	12/20/01	0.64	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.64	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.12
PW3S	04/25/02	0.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.76

Note: Only analytes detected in one or more samples are shown. ND = not detected. -- = not analyzed. Bold face result indicates remediation goal is exceeded. Field duplicates are indicated by sample ID shown in parentheses with well ID.

Table 6-1c

~~Table 6b~~

Summary of Groundwater and Surface Water Organic Chemistry (sorted by transects)
Permeable Reactive Wall, Interim Remedial Action, NECOU

Location	Analyte	Total Volatiles	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,2-Dichloroethane	2-Butanone (MEK)	2-Hexanone	4-Methyl-2-pentanone	Acetone	Benzene	Bromochloromethane	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Ethylbenzene	m-Xylene and p-Xylene	Naphthalene	o-Xylene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Dissolved Organic Carbon
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
	Remediation Goals	–	200	5	–	7	–	5	–	–	–	–	5	–	–	–	100	–	70	–	700	–	–	–	5	1000	100	5	2	–
	DATE COLLECTED																													
CW7S	03/23/01	1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.82	ND	ND	ND	ND	ND	1.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.1
CW7S	07/16/01	2.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.62	ND	ND	ND	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	0.52	ND	4.1
CW7S	09/27/01	2.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.06	ND	ND	ND	ND	ND	1.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15.8
CW7S	12/12/01	5.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.42	0.58	ND	ND	ND	ND	ND	1.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.6
CW7S	04/23/02	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	ND	ND	ND	ND	ND	0.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.21
CW6D	04/02/01	10.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.13	8.33	ND	ND	ND	ND	ND	ND	ND	ND	1.04	ND	1.2
CW6D	07/16/01	37.68	ND	ND	1.07	0.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	28.8	ND	ND	ND	ND	ND	ND	ND	0.37	7.01	ND	0.9
CW6D	09/27/01	62.4	ND	ND	ND	ND	25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	37.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16.4
CW6D	12/12/01	31.13	ND	ND	0.63	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17.7	ND	ND	ND	ND	ND	ND	ND	ND	12.8	ND	1.28
CW6D	04/18/02	36.36	ND	ND	0.76	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	17.6	ND	2.59
PW3D	03/26/01	1.88	ND	ND	0.52	ND	ND	ND	ND	ND	ND	ND	0.88	ND	ND	ND	ND	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.1
PW3D	07/11/01	0.9	ND	ND	0.32	ND	ND	ND	ND	ND	ND	ND	0.58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9
PW3D	09/20/01	2.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.7	4.1
PW3D	12/20/01	13.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.4	0.95	ND	ND	ND	ND	ND	0.92	ND	ND	ND	ND	ND	ND	1.52	ND	ND	ND	7.63
PW3D	04/25/02	0.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.89
CW7D	03/23/01	401.93	ND	ND	9.94	4.08	ND	ND	1.26	ND	ND	ND	0.97	ND	ND	0.72	ND	0.64	220	ND	ND	ND	ND	ND	4.81	ND	1.71	128	29.8	2.4
CW7D	07/16/01	328.24	ND	ND	8.11	3.28	ND	ND	ND	ND	ND	ND	0.58	ND	ND	0.79	ND	ND	153	ND	ND	ND	ND	ND	3.97	ND	1.91	119	37.6	2.3
CW7D	09/26/01	494.52	ND	ND	7.14	3.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.79	ND	ND	245	ND	ND	ND	ND	ND	3.79	ND	1.34	180	53.2	16.6
CW7D	12/17/01	44.07	ND	ND	0.86	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.1	ND	ND	ND	ND	ND	ND	ND	ND	14.1	7.01	5.11
CW7D	04/18/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.12
CW6B	04/04/01	4.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.84	ND	0.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3
CW6B	07/16/01	1.96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.42	ND	0.25	ND	ND	ND	ND	ND	ND	ND	ND	0.29	ND	ND	ND	0.9
CW6B	09/27/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16.5
CW6B	12/18/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.83
CW6B	04/19/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.49
CW7B	03/26/01	4.41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.26	0.61	ND	1.21	0.38	0.91	ND	ND	ND	ND	ND	ND	ND	ND	1.04	ND	2.1
CW7B	07/13/01	1.97	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.64	ND	ND	ND	0.68	ND	ND	ND	ND	ND	ND	ND	ND	0.65	ND	4.6
CW7B	09/26/01	3.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.41	ND	ND	ND	ND	ND	ND	ND	ND	2.39	ND	14.9
CW7B	12/18/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.75
CW7B	04/22/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.77
CW10S	12/27/01	76.99	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	37.8	ND	ND	ND	ND	ND	0.64	0.65	ND	37.9	ND	4.29
CW10S	05/01/02	76.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	35.6	ND	ND	ND	ND	ND	0.55	ND	ND	40	ND	7.72
PW4S	03/29/01	2.78	ND	ND	1.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.54	0.95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3
PW4S	07/11/01	0.61	ND	ND	0.61	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
PW4S	09/19/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.26
PW4S	12/21/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.33
PW4S	04/30/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.64
CW8S	03/27/01	95.26	ND	ND	5.58	1.08	ND	ND	ND	ND	ND	ND	0.29	ND	ND	0.37	ND	ND	72.3	ND	ND	ND	ND	ND	0.32	ND	0.62	14.7	ND	1.4
CW8S	07/17/01	54.98	ND	ND	4.24	0.68	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.3	ND	ND	39.4	ND	ND	ND	ND	ND	ND	ND	0.48	9.88	ND	1.3
CW8S	09/28/01	39.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32	ND	ND	ND	ND	ND	ND	ND	ND	7.01	ND	11.5
CW8S	12/17/01	59.23	ND	ND	4.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	ND	ND	ND	ND	ND	ND	ND	ND	4.86	ND	2.29
CW8S	04/30/02	21.6	ND	ND	1.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18.1	ND	ND	ND	ND	ND	ND	ND	ND	2.19	ND	3.54
CW10D	12/27/01	145.11	0.91	ND	10.9	1.81	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	62.5	ND	ND	ND	ND	ND	ND	0.79	ND	68.2	ND	4.33
CW10D	05/01/02	103.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	55.1	ND	ND	ND	ND	ND	ND	ND	0.58	48.1	ND	1.35

Note: Only analytes detected in one or more samples are shown. ND = not detected. – = not analyzed. Bold face result indicates remediation goal is exceeded. Field duplicates are indicated by sample ID shown in parentheses with well ID.

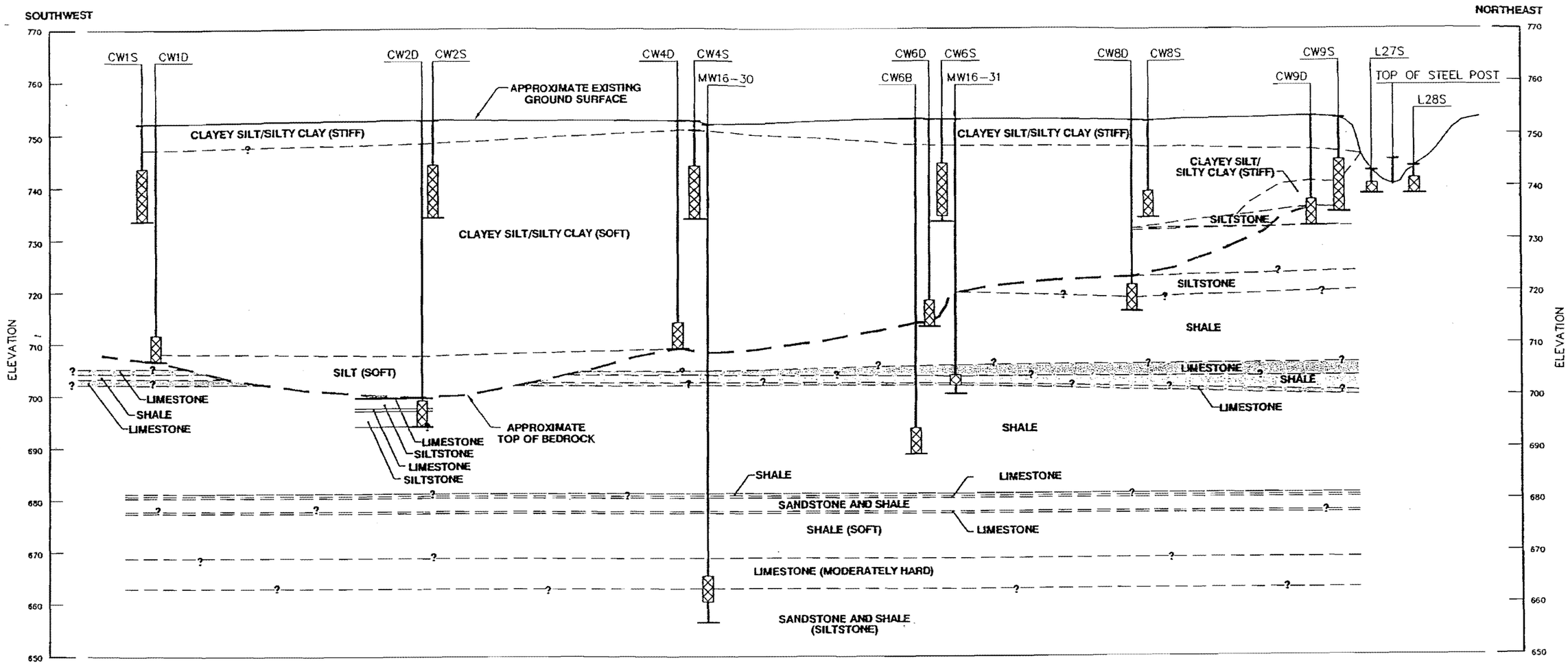
Table 6-1d

~~Table 6b~~

Summary of Groundwater and Surface Water Organic Chemistry (sorted by transects)
Permeable Reactive Wall, Interim Remedial Action, NECOU

Location	Analyte	Total Volatiles	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,2,4-Trimethylbenzene	1,2-Dichloroethane	2-Butanone (MEK)	2-Hexanone	4-Methyl-2-pentanone	Acetone	Benzene	Bromochloromethane	Carbon disulfide	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	Dichlorodifluoromethane	Ethylbenzene	m-Xylene and p-Xylene	Naphthalene	o-Xylene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride	Dissolved Organic Carbon
		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)
	Remediation Goals	--	200	5	--	7	--	5	--	--	--	--	5	--	--	--	100	--	70	--	700	--	--	--	5	1000	100	5	2	--
	DATE COLLECTED																													
PW4D	03/29/01	1.67	ND	ND	1.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.7
PW4D	07/11/01	0.7	ND	ND	0.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3
PW4D	09/19/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.32
PW4D	12/21/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.01
PW4D	04/30/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.46
CW8D	03/26/01	17.05	ND	ND	2.12	0.45	ND	ND	ND	ND	ND	ND	ND	ND	0.83	0.34	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.41	**12.9**	ND	1.5
CW8D	07/11/01	46.39	ND	ND	1.53	0.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.38	ND	ND	34.3	ND	ND	ND	ND	ND	ND	0.38	0.27	**9.15**	ND	1.6
CW8D	09/27/01	28.31	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	21.6	ND	ND	ND	ND	ND	ND	ND	ND	**6.71**	ND	11.2
CW8D	12/21/01	19.64	ND	ND	0.69	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14.4	ND	ND	ND	ND	ND	ND	ND	ND	2.03	2.52	2.2
CW8D	04/30/02	11.89	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.6	ND	ND	ND	ND	ND	ND	ND	ND	2.64	1.65	3.48
CW9S	03/29/01	25.9	ND	ND	1.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.82	16.5	ND	ND	ND	ND	ND	ND	ND	0.27	**7.07**	ND	2.1
CW9S	07/17/01	86.43	0.43	ND	2.42	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	43.9	ND	ND	ND	0.33	ND	0.54	ND	0.71	**38.1**	ND	1.6
CW9S	09/28/01	65.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32.9	ND	ND	ND	ND	ND	1.1	ND	ND	**31.1**	ND	15.2
CW9S	12/26/01	55.38	ND	ND	0.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27.9	ND	ND	ND	ND	ND	0.59	ND	ND	**26.1**	ND	2.39
CW9S	05/01/02	36.56	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	20.4	ND	ND	ND	ND	ND	ND	ND	ND	**15**	ND	6.87
CW9D	03/30/01	141.41	0.49	ND	3.43	0.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.71	**105**	ND	ND	ND	ND	ND	ND	ND	2.93	**28.6**	ND	1.2
CW9D	07/11/01	120.06	0.48	ND	2.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.71	**97.9**	ND	ND	ND	ND	ND	ND	ND	5.1	**13.6**	ND	1.4
CW9D	09/28/01	71.38	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.71	65.2	ND	ND	ND	ND	ND	ND	ND	2.38	3.09	ND	14.9
CW9D	12/26/01	56.97	ND	ND	0.79	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50.4	ND	ND	ND	ND	ND	ND	ND	0.51	5.27	ND	2.22
CW9D	05/01/02	80.03	ND	ND	0.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	57.2	ND	ND	ND	ND	ND	ND	ND	0.76	**21.2**	ND	1.86
SW16-01	10/01/01	40.87	ND	ND	4.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.18	ND	ND	30.1	ND	ND	ND	ND	ND	ND	ND	ND	1.06	3.7	--
SW16-01	12/27/01	51.95	ND	ND	5.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.53	ND	ND	39.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.48	--
SW16-01	05/02/02	12.42	ND	ND	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.81	ND	ND	7.22	ND	ND	ND	ND	ND	ND	ND	ND	0.86	0.83	--
SW16-02	10/01/01	23.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15.5	ND	ND	ND	ND	ND	ND	ND	ND	8.37	ND	--
SW16-02	12/27/01	22.33	ND	ND	0.78	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	16.3	ND	ND	ND	ND	ND	ND	ND	ND	**5.25**	ND	--
SW16-02	05/02/02	8.38	ND	ND	1.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.52	ND	ND	ND	ND	ND	ND	ND	ND	1.58	ND	--

Note: Only analytes detected in one or more samples are shown. ND = not detected. -- = not analyzed. Bold face result indicates remediation goal is exceeded. Field duplicates are indicated by sample ID shown in parentheses with well ID.



LEGEND:

SCREENED SECTION

VERTICAL SCALE

0 20 40 FEET

HORIZONTAL SCALE

0 40 80 FEET

Shaw
Shaw E & I, Inc.

U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

FIGURE 2-1

GENERAL GEOLOGIC CROSS SECTION
SOUTH EAST OF THE PRW
LOOKING NORTHWEST
LAKE CITY ARMY AMMUNITION PLANT
INDEPENDENCE, MISSOURI

DRAWING NUMBER 775871-B21

APPROVED BY

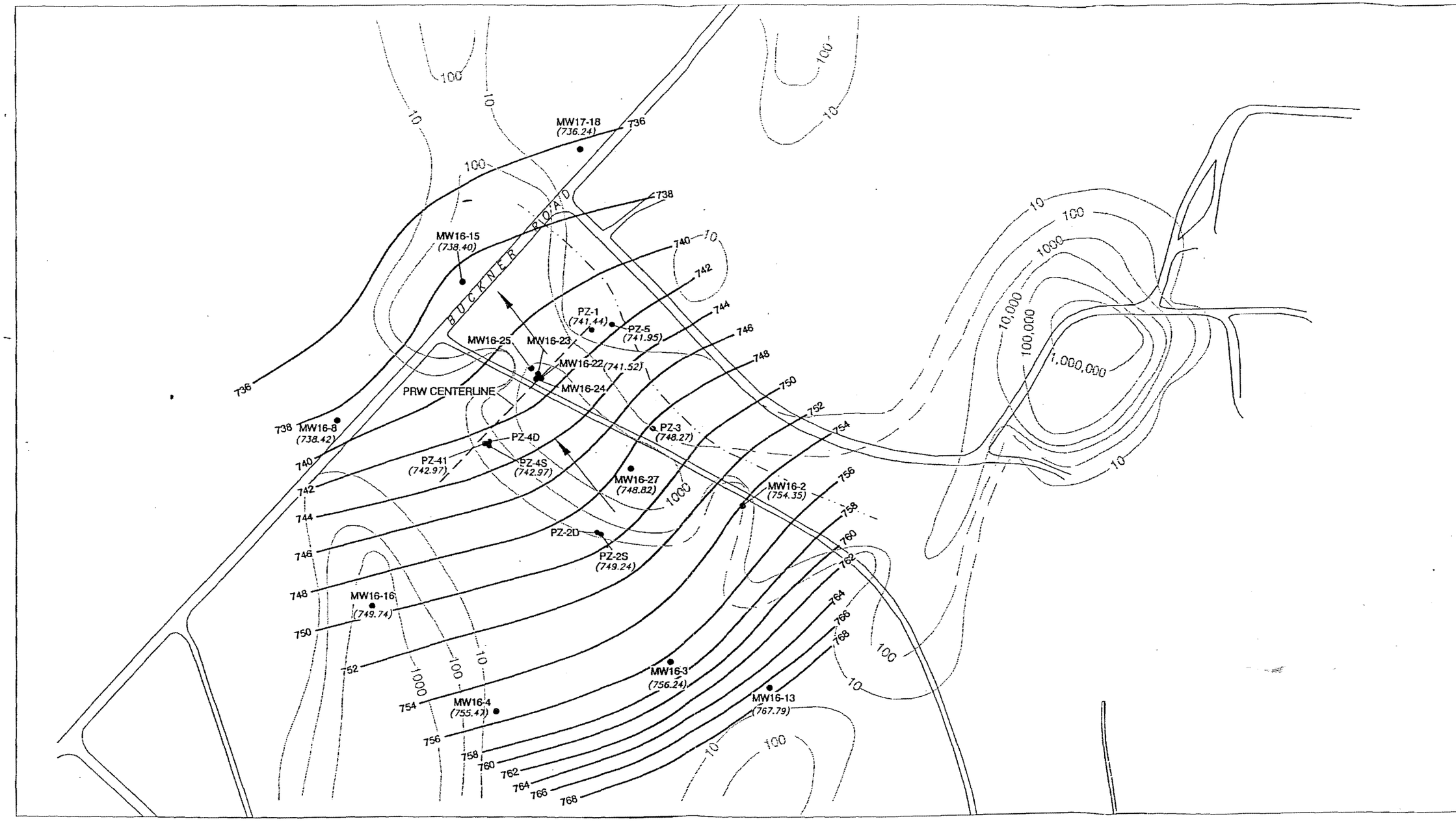
CHECKED BY

DRAWN

OFFICE Pittsburgh, PA

Xref: , sec

Plotted by: KWEIBLE



LEGEND

MW ●	MONITORING WELL
PZ ●	PIEZOMETER
—740—	GROUNDWATER ELEVATION CONTOUR SHALLOW OVERBURDEN (CONTOUR INTERVAL 2 FEET)
(767.79)	GROUNDWATER ELEVATION (FEET NGVD29). AUGUST 1999
—10—	TOTAL VOCs CONCENTRATION CONTOUR, (μg/L.) 20 TO 50 FEET BGS (DASHED WHERE INFERRED; MODIFIED FROM EA, AUGUST 1999)
←	APPROX. HORIZONTAL HYDRAULIC GRADIENT
- - - -	CENTERLINE OF PRW
— · — · —	STREAM (APPROXIMATE LOCATION)

SCALE
0 200 400 FEET

IT CORPORATION

U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

August 1999
POTENTIOMETRIC SURFACE OF SHALLOW OVERBURDEN

Figure 2-2

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
HOS 1-16-01			775871-B27

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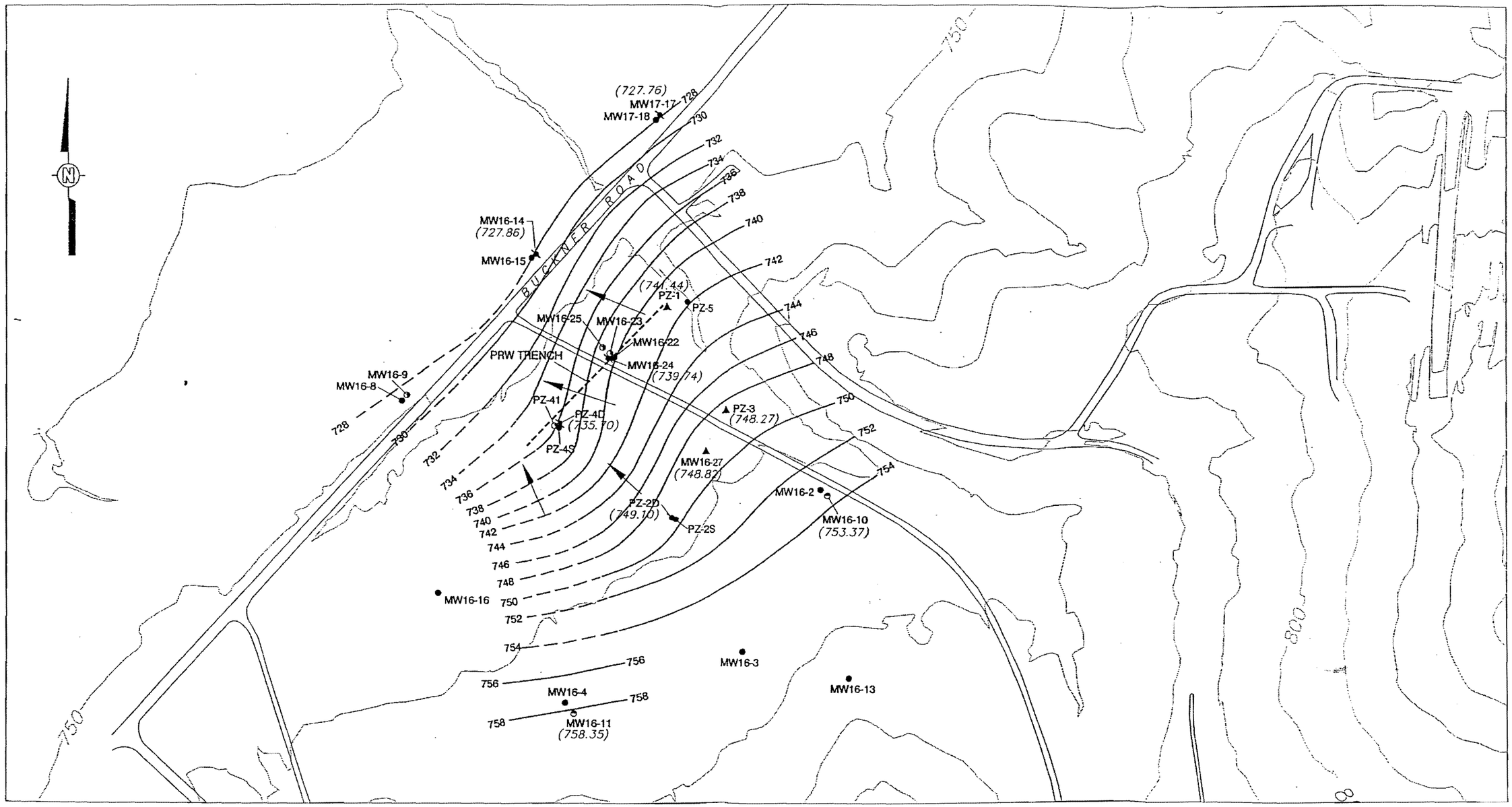

LEGEND

- ● SHALLOW OVERBURDEN WELL
- ○ INTERMEDIATE OVERBURDEN WELL
- DEEP OVERBURDEN WELL
- ▲ FULLY SCREENED OVERBURDEN WELL
- BEDROCK WELL

APPROXIMATE HORIZONTAL HYDRAULIC GRADIENT

748 GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED (CONTOUR INTERVAL 2 FEET)

(755.47) GROUNDWATER ELEVATION (FEET NGVD29) AUGUST 1999

SCALE
0 200 400 FEET

IT CORPORATION

U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

August 1999

POTENTIOMETRIC SURFACE OF DEEP OVERBURDEN

Figure 2-3

DRAWN HDS 1-16-01
CHECKED BY
APPROVED BY
DRAWING NUMBER 775871-B28

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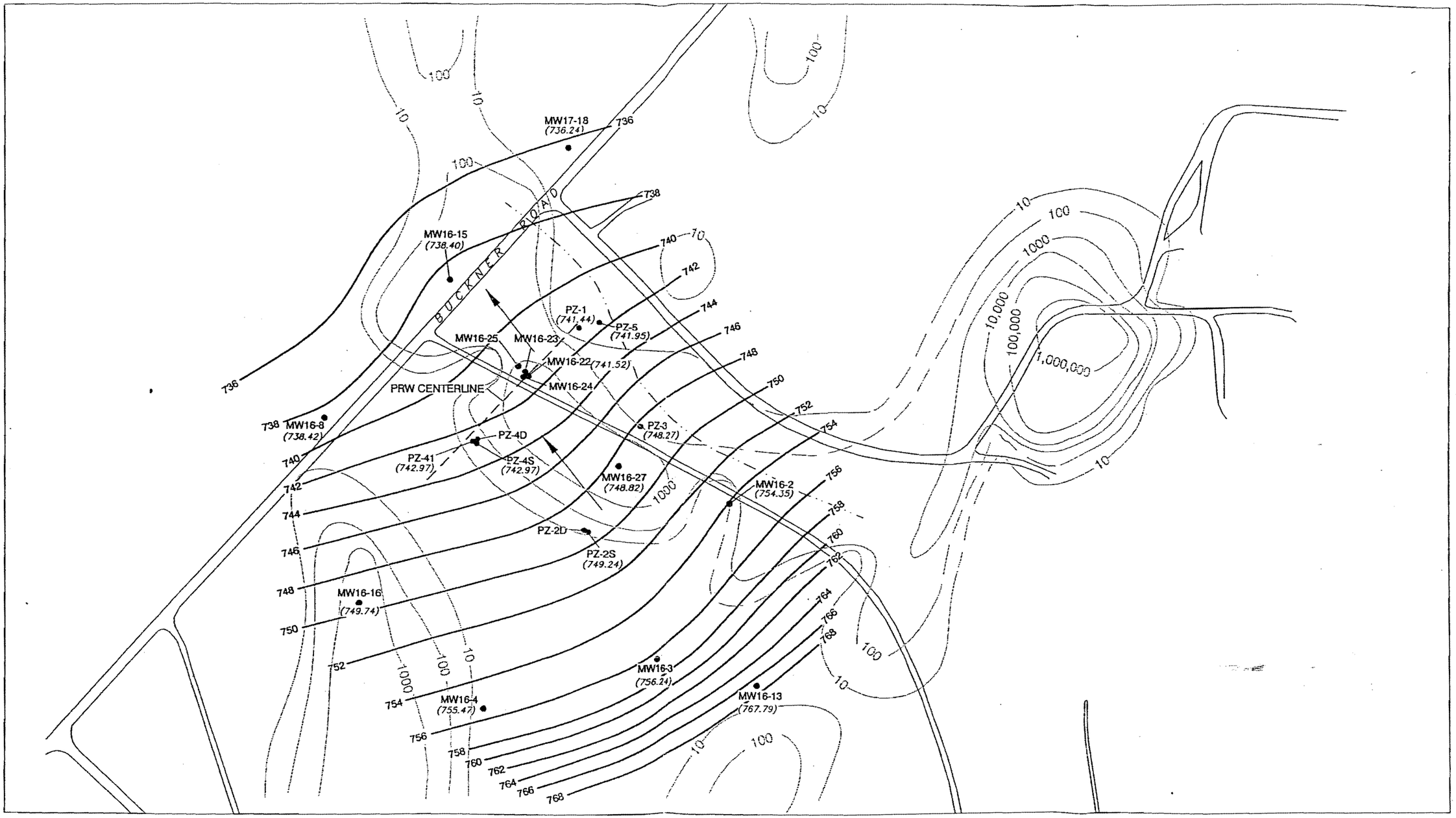


LEGEND

MW ●	MONITORING WELL
PZ ●	PIEZOMETER
—740—	GROUNDWATER ELEVATION CONTOUR SHALLOW OVERBURDEN (CONTOUR INTERVAL 2 FEET)
(767.79)	GROUNDWATER ELEVATION (FEET NGVD29), AUGUST 1999
—10—	TOTAL VOCs CONCENTRATION CONTOUR, (μg/L,) 20 TO 50 FEET BGS (DASHED WHERE INFERRED; MODIFIED FROM EA, AUGUST 1999)
←	APPROX. HORIZONTAL HYDRAULIC GRADIENT
- - - -	CENTERLINE OF PRW
— · — · —	STREAM (APPROXIMATE LOCATION)

SCALE
0 200 400 FEET

IT CORPORATION

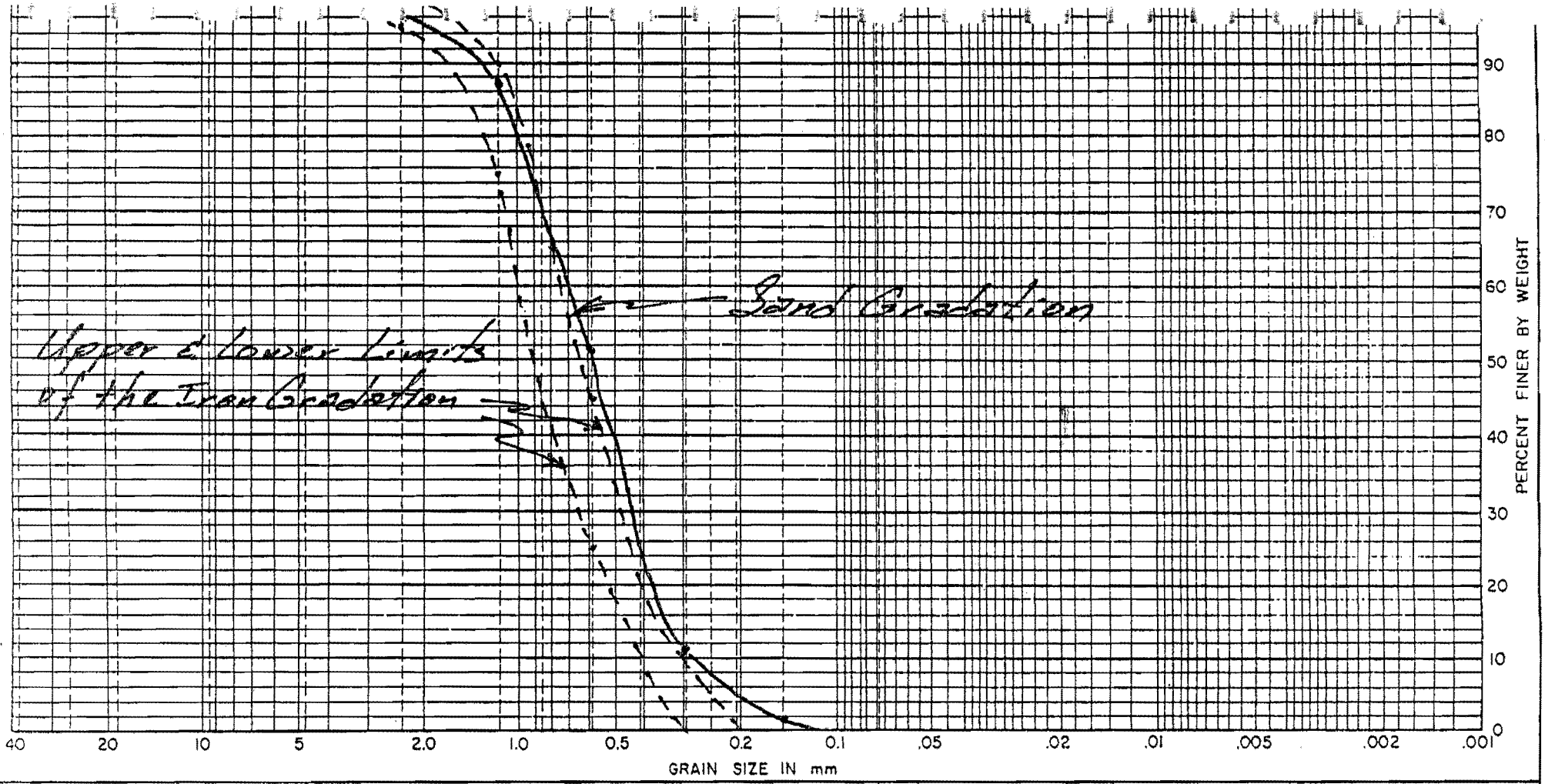
U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

TOTAL VOLATILE ORGANIC COMPOUND PLUME

Figure 2-4

DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
HDS 1-15-01			775871-B26

Jul 16, 2001 - 15:13:35 I:\IT CORP\Denver\775871\775871B26.dwg



GRAVEL		SAND			CLAY OR SILT
COARSE	FINE	COARSE	MEDIUM	FINE	

SYMBOL	BORING NO.	DEPTH	DESCRIPTION OF SAMPLE
			Sand $C_u = \frac{.59}{.28} = 2.1$

PRW Backf. II
Material Gradations

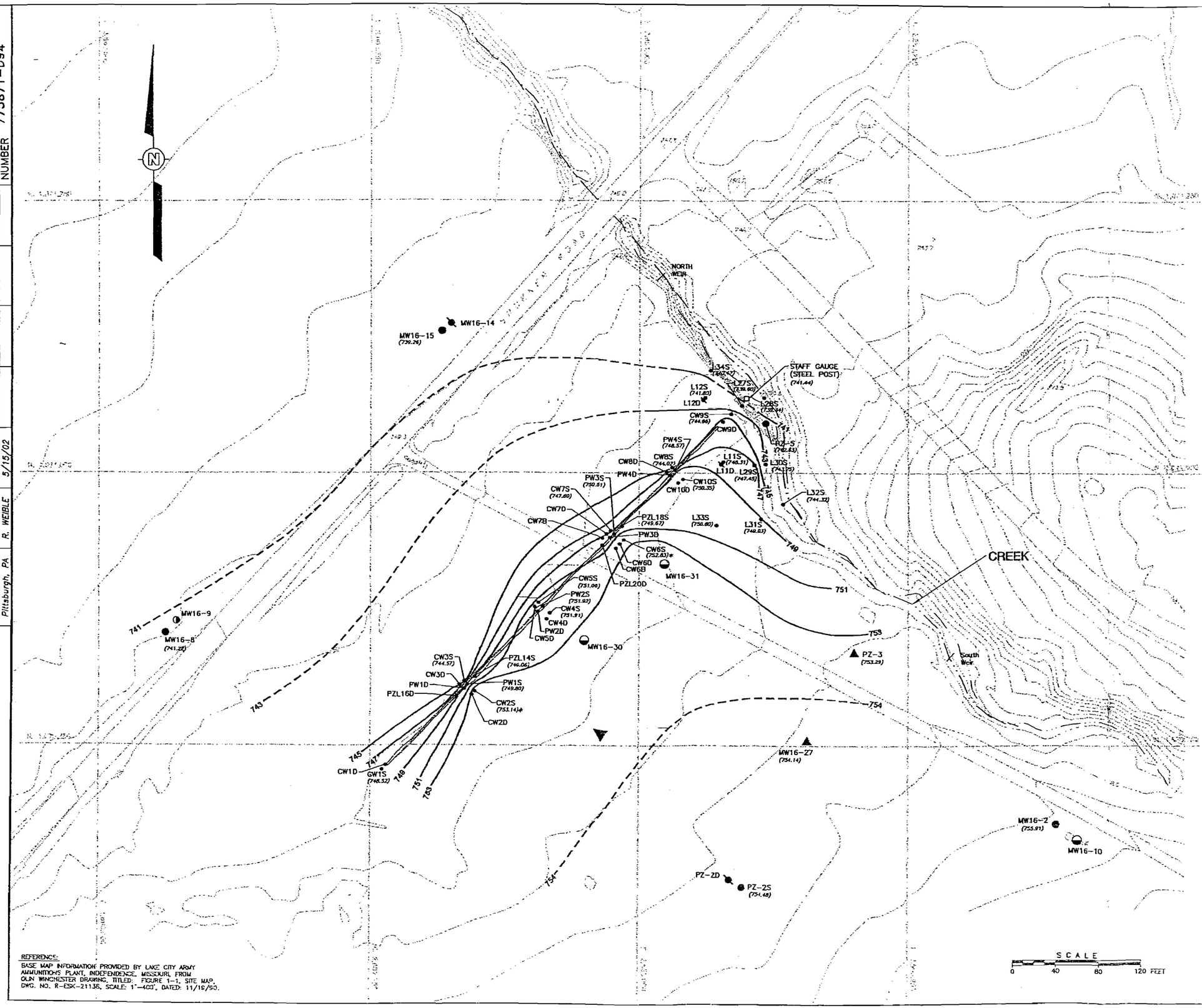
DRAWN BY: JM
CHECKED BY:

PROJECT NO.

GRADATION CURVES

FIG. NO. 5-1

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Pittsburgh, PA	R. WEIBLE 5/15/02			775871-D94



REFERENCE:
BASE MAP INFORMATION PROVIDED BY LAKE CITY ARMY AMMUNITIONS PLANT, INDEPENDENCE, MISSOURI, FROM OLIN WINCHESTER DRAWING, TITLED: FIGURE 1-1, SITE MAP, DWG. NO. R-ESK-21136, SCALE: 1"=400', DATED: 11/16/90.

LEGEND:

- ● SHALLOW OVERBURDEN WELL
- ◐ INTERMEDIATE OVERBURDEN WELL
- ◣ DEEP OVERBURDEN WELL
- ▲ FULLY SCREENED OVERBURDEN WELL
- ◒ BEDROCK WELL
- PZL14S • PIEZOMETER
- CW2 • COMPLIANCE WELL
- PW2 • PERFORMANCE WELL
- (S/D/B) SHALLOW/DEEP/BEDROCK
- ——— TOP OF PRW ZERO VALENT IRON/SAND TREATMENT MEDIA AT APPROXIMATELY THE 748-FOOT ELEVATION
- (741.44) SURFACE WATER ELEVATION, FEET NGVD29
- (741.44) GROUNDWATER ELEVATION, FEET NGVD29
- ——745—— GROUNDWATER ELEVATION CONTOUR
- — —741— — INFERRED GROUNDWATER ELEVATION CONTOUR
- * GROUNDWATER ELEVATION HIGHER THAN GROUND SURFACE ELEVATION

NOTES:

1. LOCATIONS OF WEIRS ARE APPROXIMATE.
2. GROUNDWATER ELEVATIONS AT CW2S AND CW6S WERE HIGHER THAN THE RESPECTIVE GROUND SURFACE ELEVATIONS. TEMPORARY STICKUPS WERE PLACED ON WELL CASINGS TO MEASURE GROUNDWATER LEVELS AT THESE LOCATIONS.
3. WATER LEVELS FROM PIEZOMETERS L27S, L28S, L30S, L32S AND L34S WERE NOT USED IN THE CONTOURING OF GROUNDWATER ELEVATIONS DUE TO UNCERTAINTY ABOUT THE ACCURACY OF THE DATA.

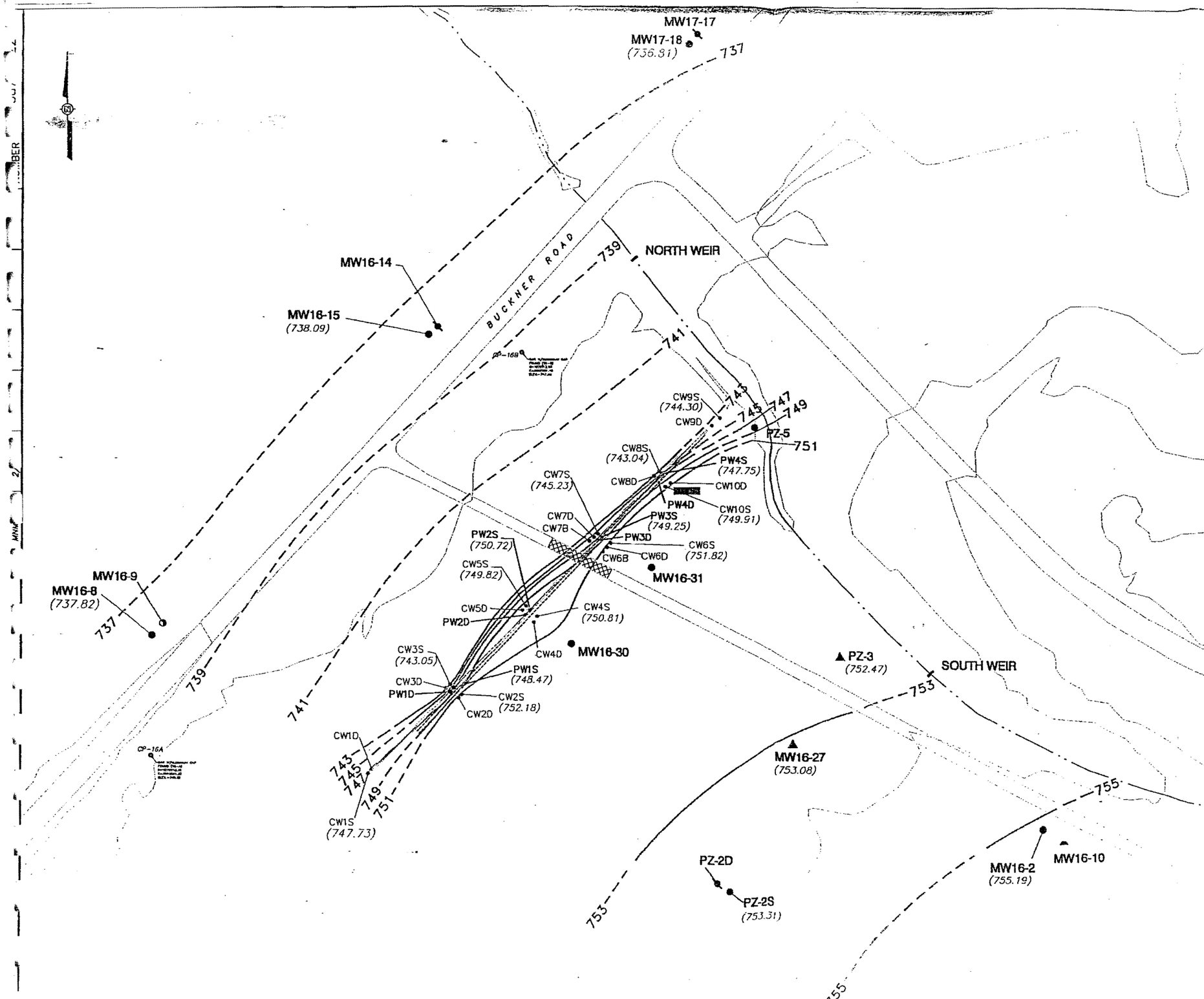
Figure 5-2

Shaw E&I, Inc.

U.S. ARMY CORP OF ENGINEERS
KANSAS CITY DISTRICT

POTENTIOMETRIC SURFACE OF SHALLOW OVERBURDEN
APRIL 15, 2002
LAKE CITY ARMY AMMUNITION PLANT
INDEPENDENCE, MISSOURI

Plot Date/Time: 07/10/02 02:39pm
Plotted by: Deevans
Images: Xref: 17_TOPO



LEGEND

- SHALLOW OVERBURDEN WELL
- INTERMEDIATE OVERBURDEN WELL
- DEEP OVERBURDEN WELL
- FULLY SCREENED OVERBURDEN WELL
- BEDROCK WELL
- CW2 • COMPLIANCE WELL
- PW2 • PERFORMANCE WELL
- (S/D/B) SHALLOW/DEEP/BEDROCK
- TOP OF PRW ZERO VALENT IRON/SAND TREATMENT MEDIA AT APPROXIMATELY THE 748-FOOT ELEVATION
- PRW CENTERLINE AT DEPTH
- GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- (753.08) GROUNDWATER ELEVATION (FEET-MSL)
- GEOTEXTILE FABRIC
- LOCATION OF WEIRS ARE APPROXIMATE
- EPHEMERAL STREAM

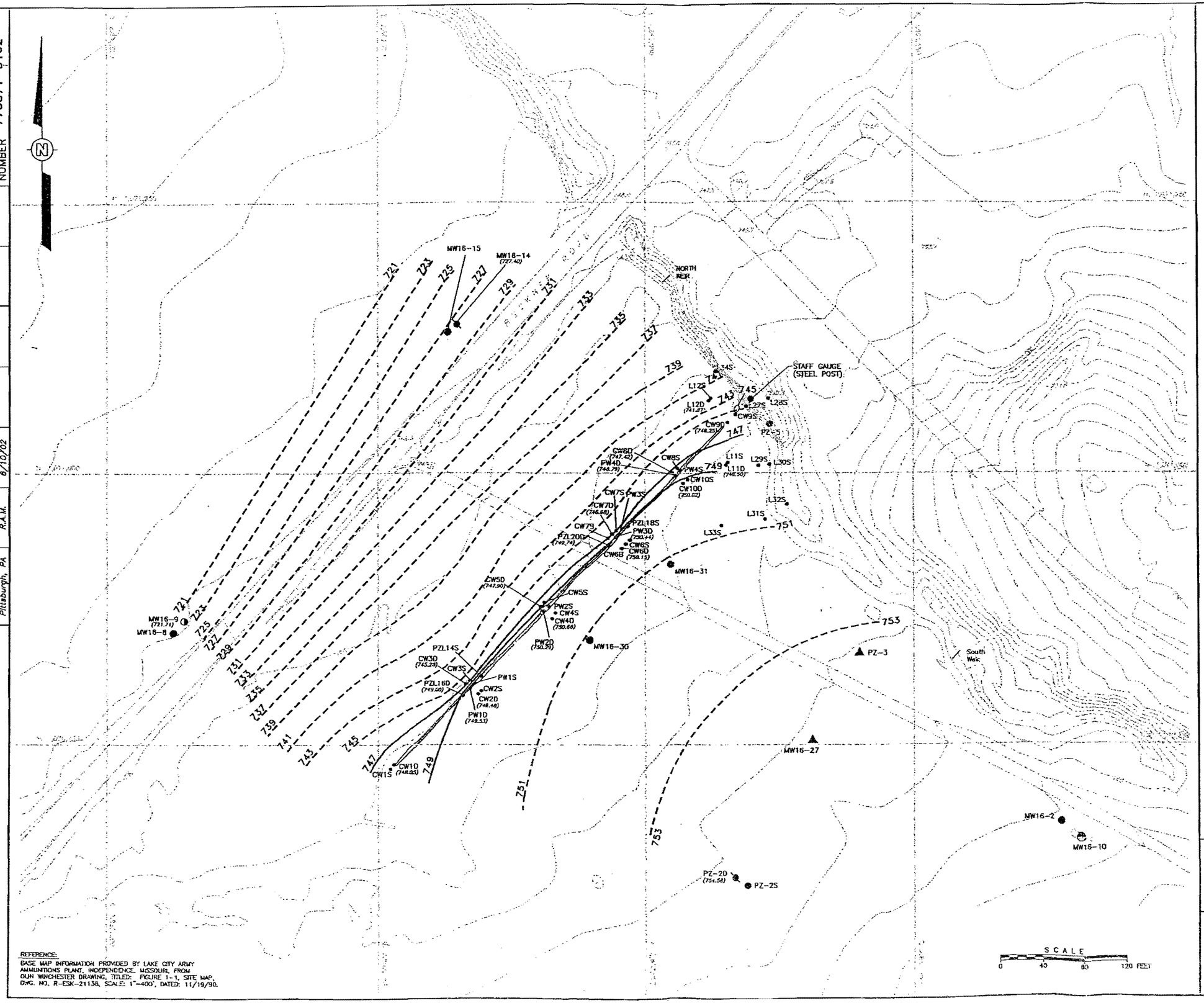
Figure 5-3

SCALE
0 40 80 160 FEET

IT CORPORATION

U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

POTENTIOMETRIC SURFACE OF
SHALLOW OVERBURDEN: DECEMBER, 2001



REFERENCE:
BASE MAP INFORMATION PROVIDED BY LAKE CITY ARMY AMMUNITIONS PLANT, INDEPENDENCE, MISSOURI, FROM OUN WINCHESTER DRAWING, TITLED: FIGURE 1-1, SITE MAP. (DWG. NO. R-ESK-21138, SCALE: 1"=400', DATED: 11/19/90.

LEGEND:

- SHALLOW OVERBURDEN WELL
- INTERMEDIATE OVERBURDEN WELL
- DEEP OVERBURDEN WELL
- FULLY SCREENED OVERBURDEN WELL
- BEDROCK WELL
- ABANDONED WELL/PIEZOMETER
- PZL14S • PIEZOMETER
- CW2 • COMPLIANCE WELL
- PW2 • PERFORMANCE WELL
- (S/D/B) SHALLOW/DEEP/BEDROCK
- TOP OF PRW ZERO VALENT IRON/SAND TREATMENT MEDIA AT APPROXIMATELY THE 748-FOOT ELEVATION
- 747 GROUNDWATER ELEVATION CONTOUR
- 743 INFERRED GROUNDWATER ELEVATION CONTOUR

NOTE:
LOCATIONS OF WEIRS ARE APPROXIMATE

Figure 5-4

Shaw E & I, Inc.

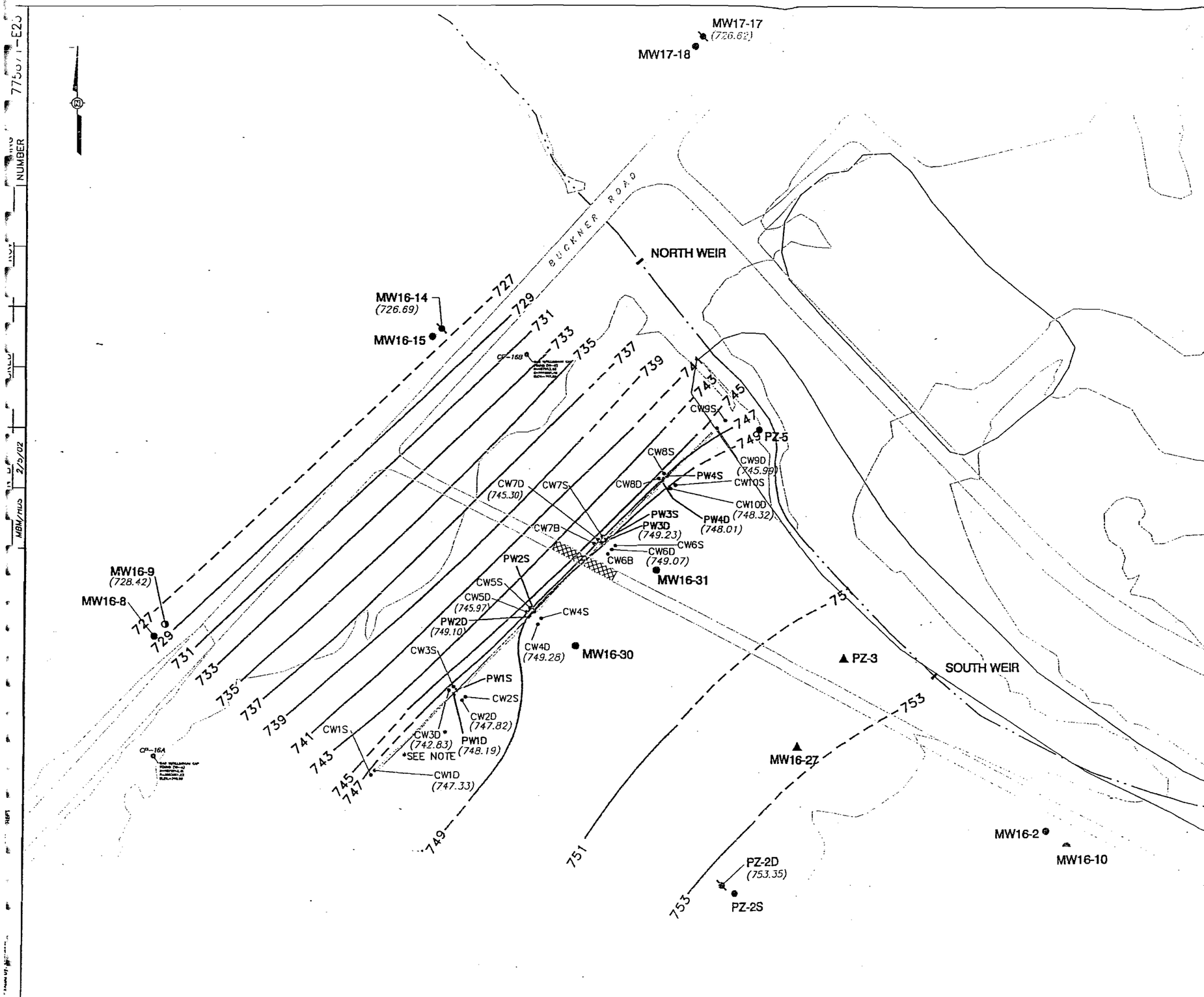
U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

POTENTIOMETRIC SURFACE OF DEEP OVERBURDEN
APRIL 15, 2002
LAKE CITY ARMY AMMUNITION PLANT
INDEPENDENCE, MISSOURI

OFFICE	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Pittsburgh, PA	R.A.M. 6/10/02			775871-D102

Image: SQW13
Xref: 17_TOPO

C:\Projects\775871\7587101D2.dwg
Plot Date/Time: 06/14/02 11:42am
Plotted by: rmckenhaupt



LEGEND

- SHALLOW OVERBURDEN WELL
- INTERMEDIATE OVERBURDEN WELL
- DEEP OVERBURDEN WELL
- FULLY SCREENED OVERBURDEN WELL
- BEDROCK WELL
- CW2 • COMPLIANCE WELL
- PW2 • PERFORMANCE WELL
- (S/D/B) SHALLOW/DEEP/BEDROCK
- TOP OF PRW ZERO VALENT IRON/SAND TREATMENT MEDIA AT APPROXIMATELY THE 748-FOOT ELEVATION
- PRW CENTERLINE AT DEPTH
- GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- (748.31) GROUNDWATER ELEVATION (FEET-MSL)
- GEOTEXTILE FABRIC
- LOCATION OF WEIRS ARE APPROXIMATE
- EPHEMERAL STREAM

NOTE:
AN ANOMALOUS GROUNDWATER ELEVATION AT CW3D IS NOT CONTOURED.

SCALE
0 40 80 160 FEET

Figure 5-5

IT CORPORATION

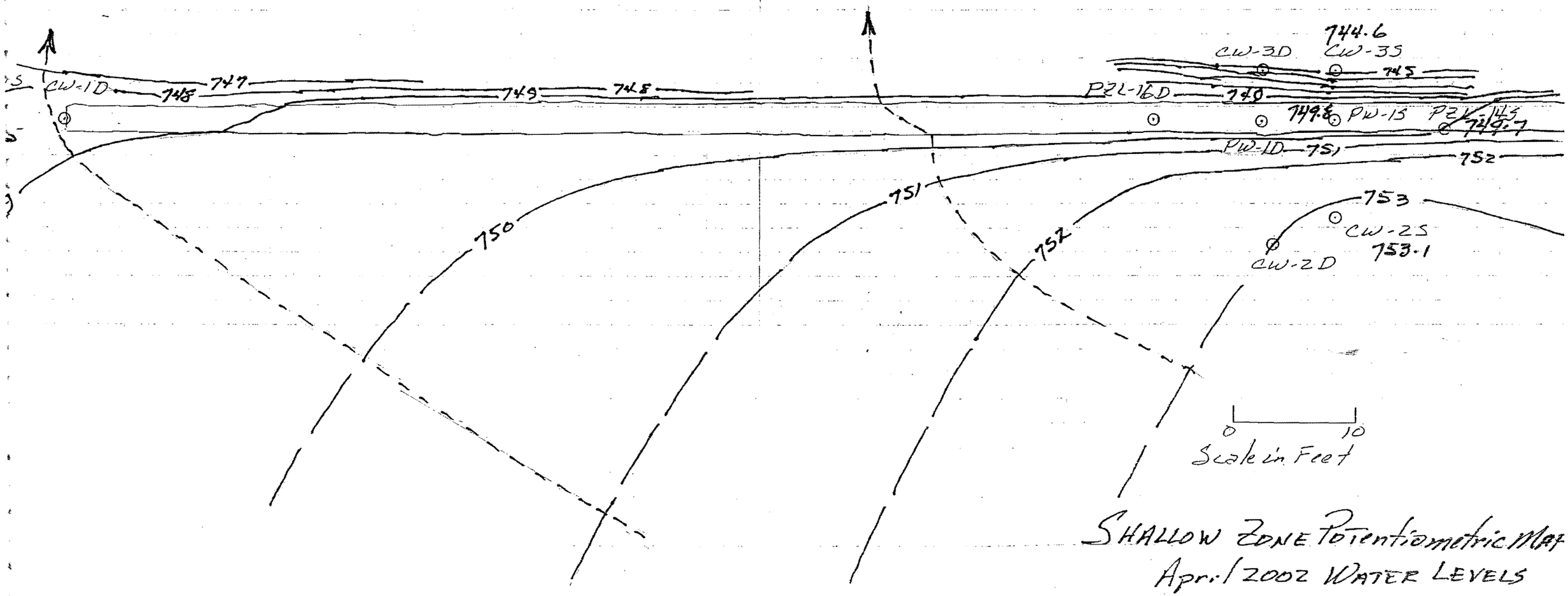
U.S. ARMY CORPS OF ENGINEERS
KANSAS CITY DISTRICT

POTENTIOMETRIC SURFACE OF
DEEP OVERBURDEN DECEMBER, 2001

NUMBER

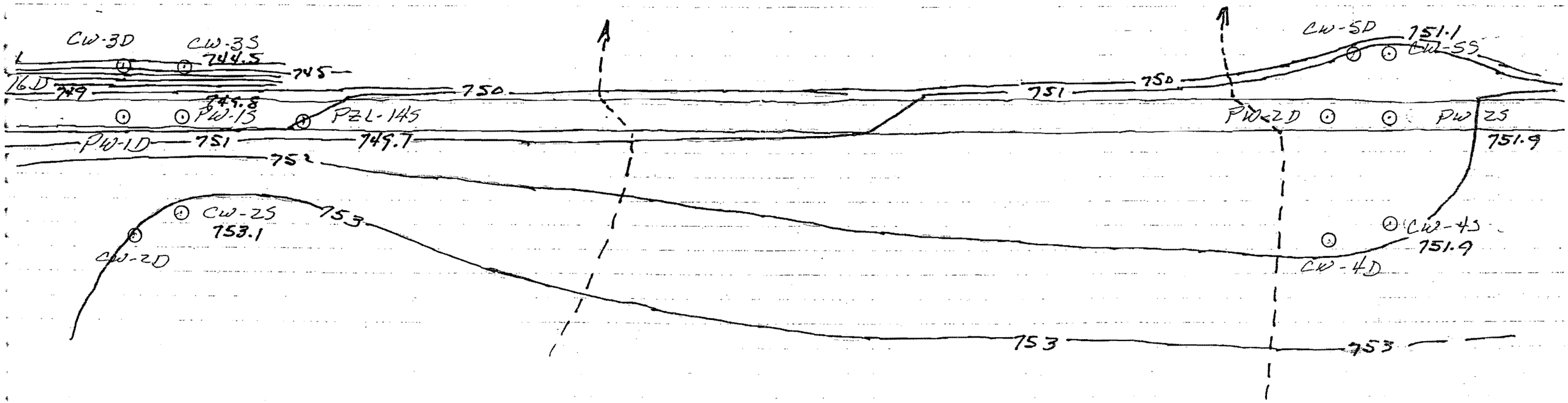
2/5/02

MBM/RUS



SHALLOW ZONE POTENTIOMETRIC MAP
April 2002 WATER LEVELS

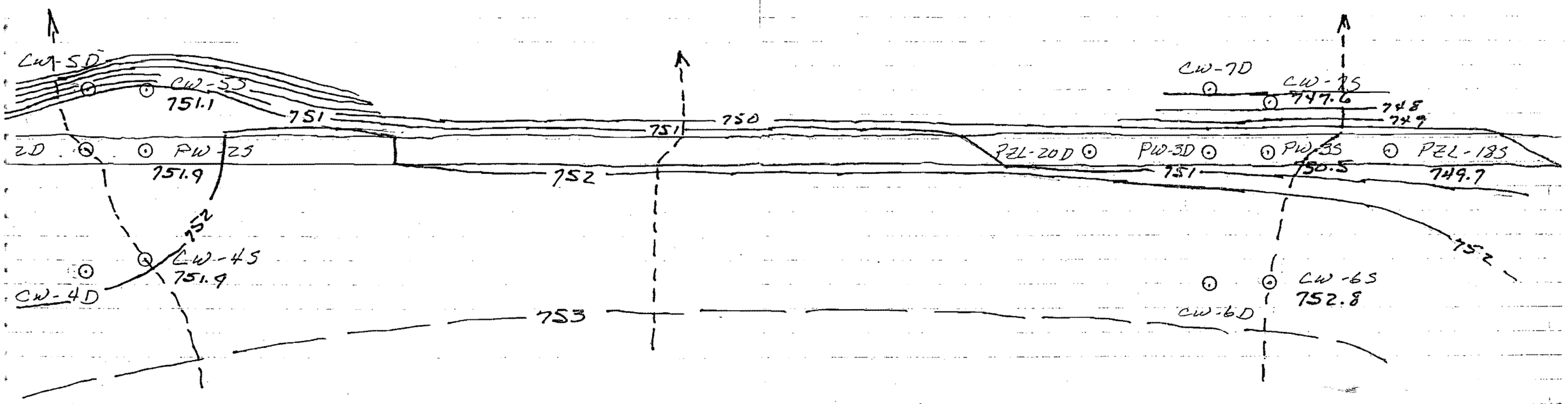
Figure 5-6a
JM 7-2-02



0 10
Scale in Feet

SHALLOW ZONE POTENTIOMETRIC MAP
April 2002 Water Levels

Figure 5-6b



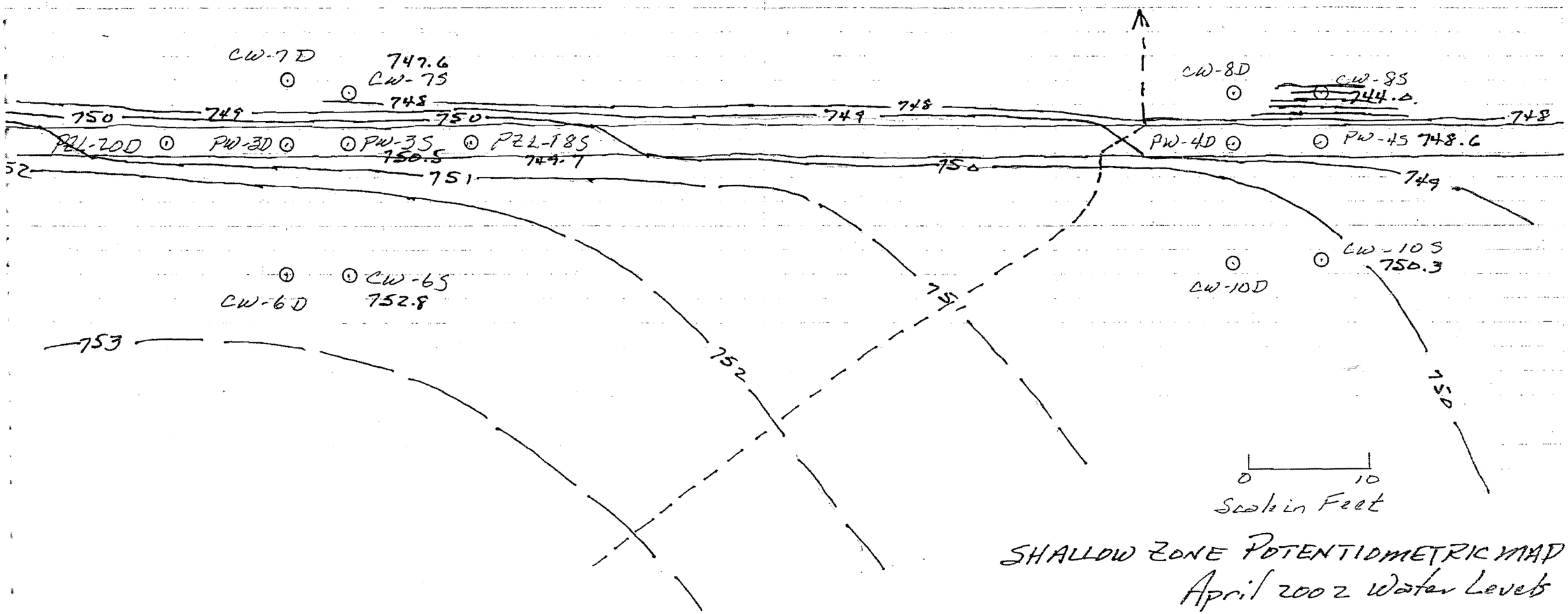
0 10

Scale in Feet

SHALLOW ZONE POTENTIOMETRIC MAP
April 2002 Water Levels

Figure 5-6c

JM 7-2-02

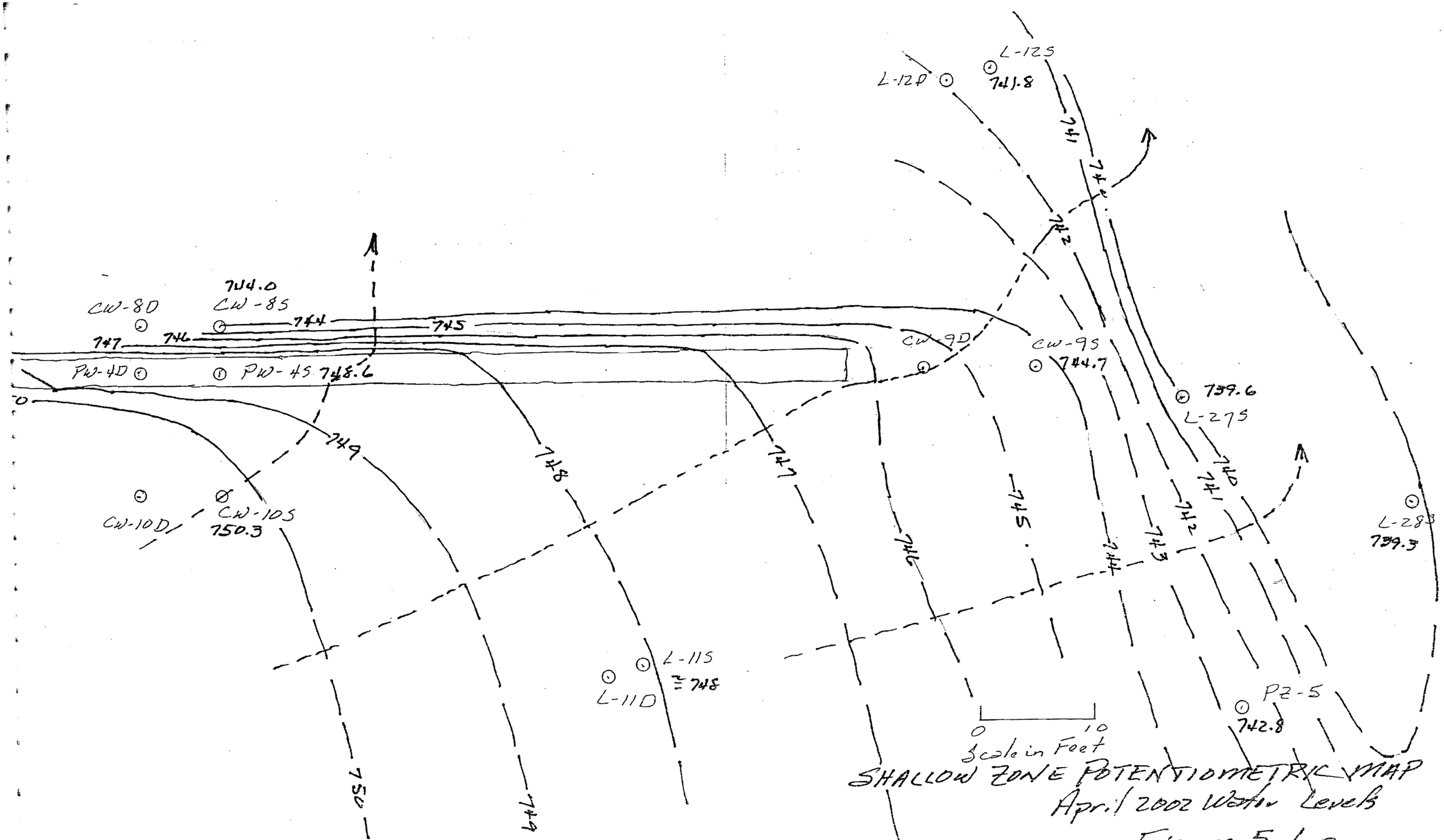


SHALLOW ZONE POTENTIOMETRIC MAP
April 2002 Water Levels

Figure 5-6d

JM 7-2-02

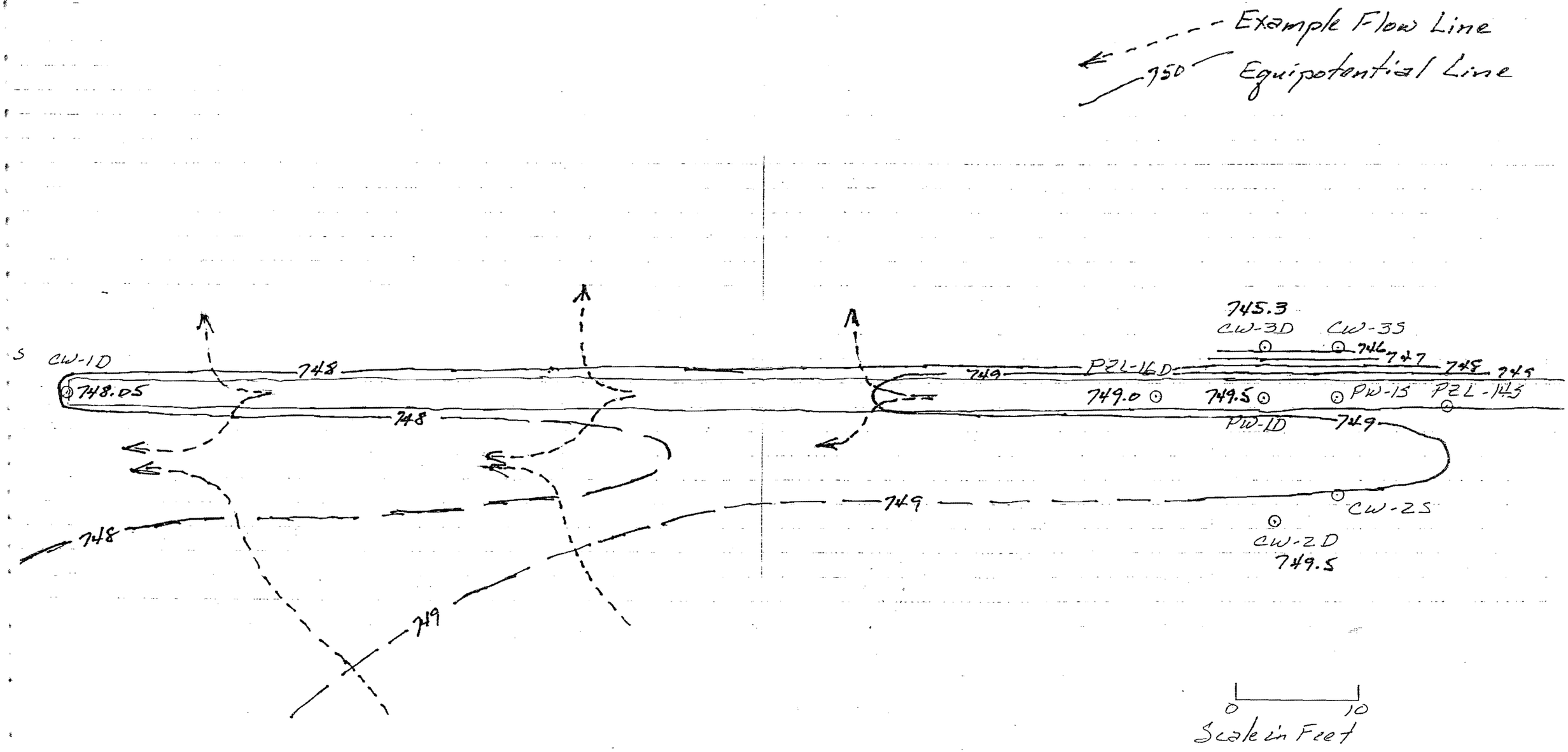
L-34S



SHALLOW ZONE POTENTIOMETRIC MAP
April 2002 Water Levels

Figure 5-6e

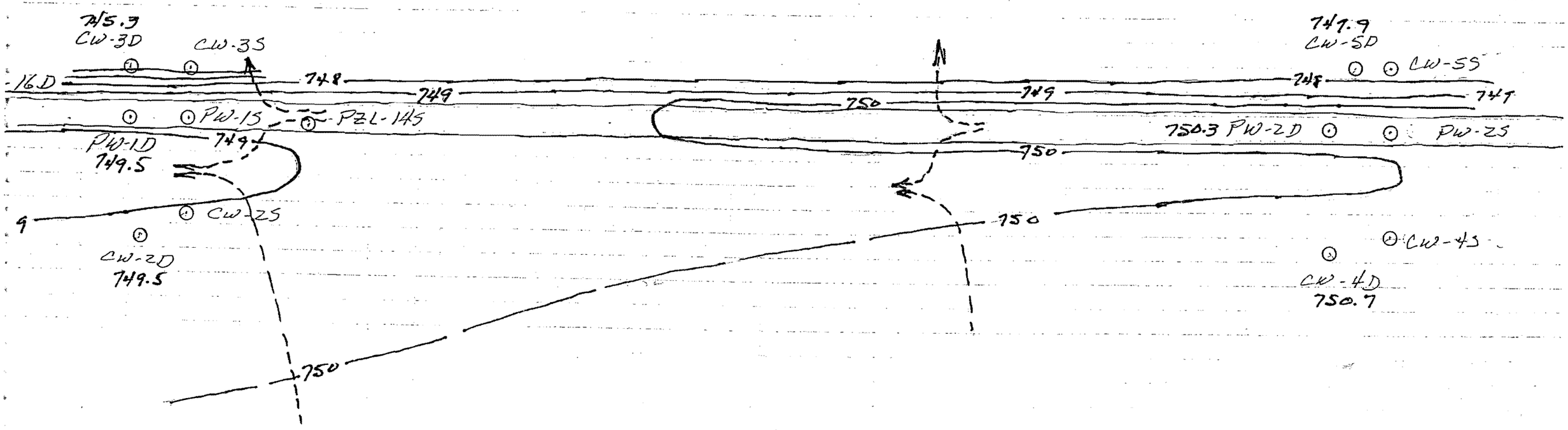
JM 7-2-02



DEEP ZONE Potentiometric MAP
April 2002 Water Levels

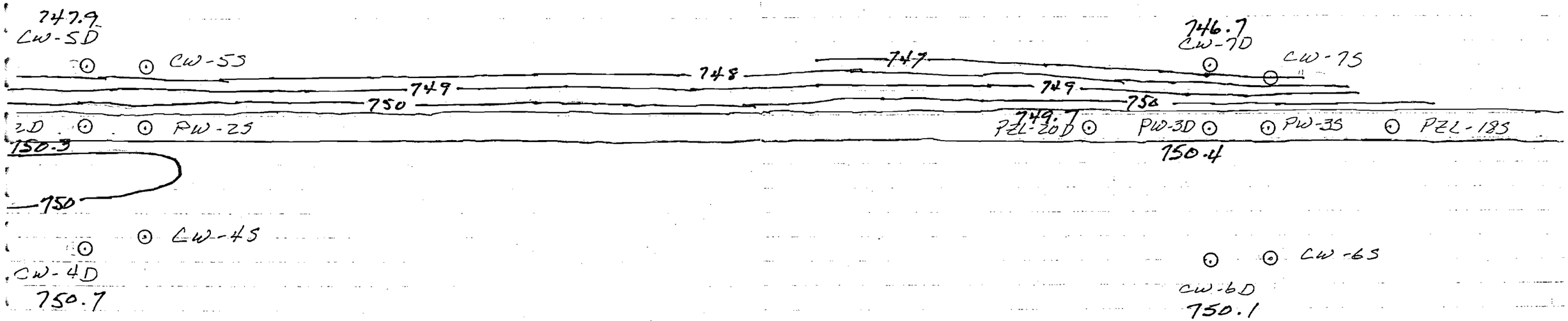
Figure 5-7a

JEM 7-2-02



0 10
Scale in Feet

DEEP ZONE POTENTIOMETRIC MAP
April 2002 Water Levels
Figure 5-7b



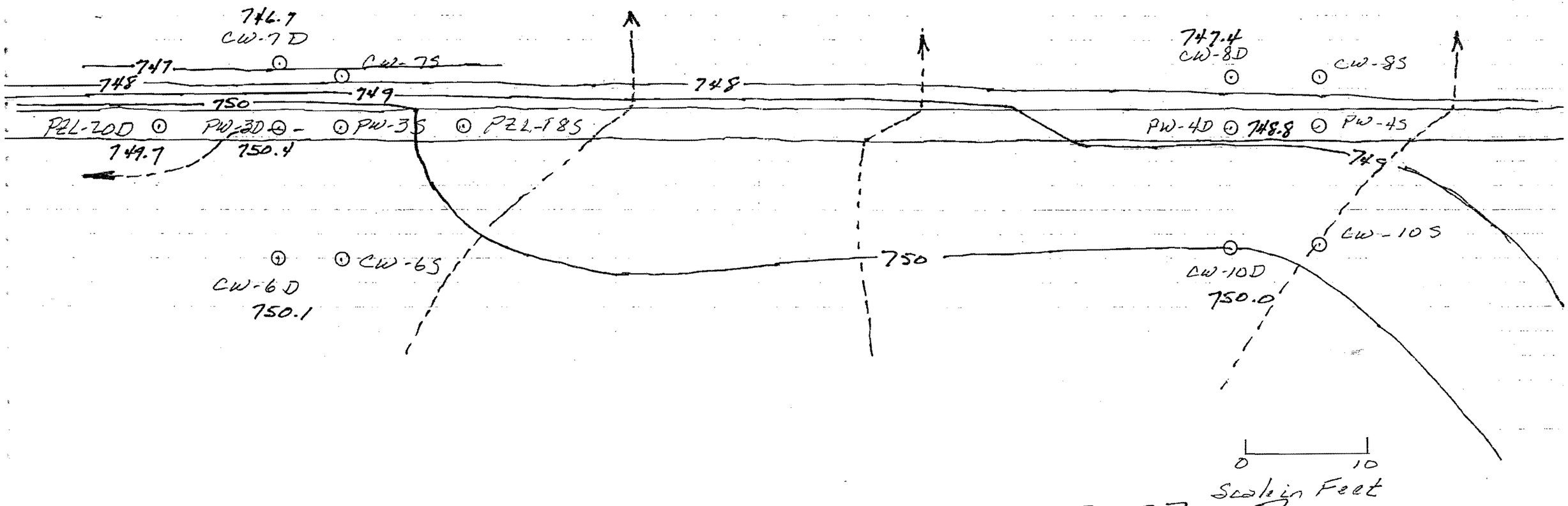
0 10

Scale in Feet

DEEP ZONE POTENTIOMETRIC MAP
April 2002 Water Levels

Figure 5-7c

JM 7-2-02

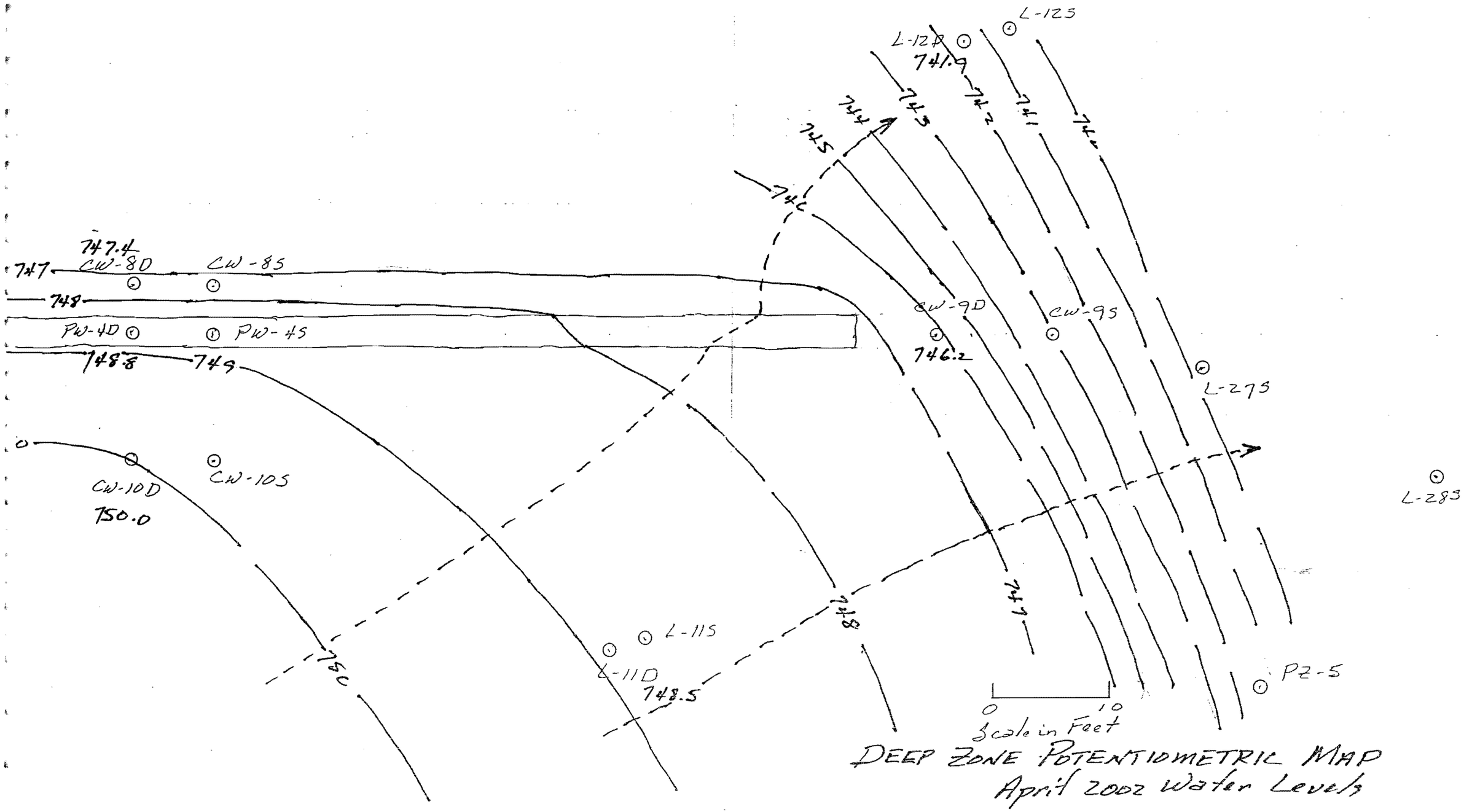


DEEP ZONE POTENTIOMETRIC MAP
April 2002 Water Levels

Figure 5-7d

JM 7-2-02

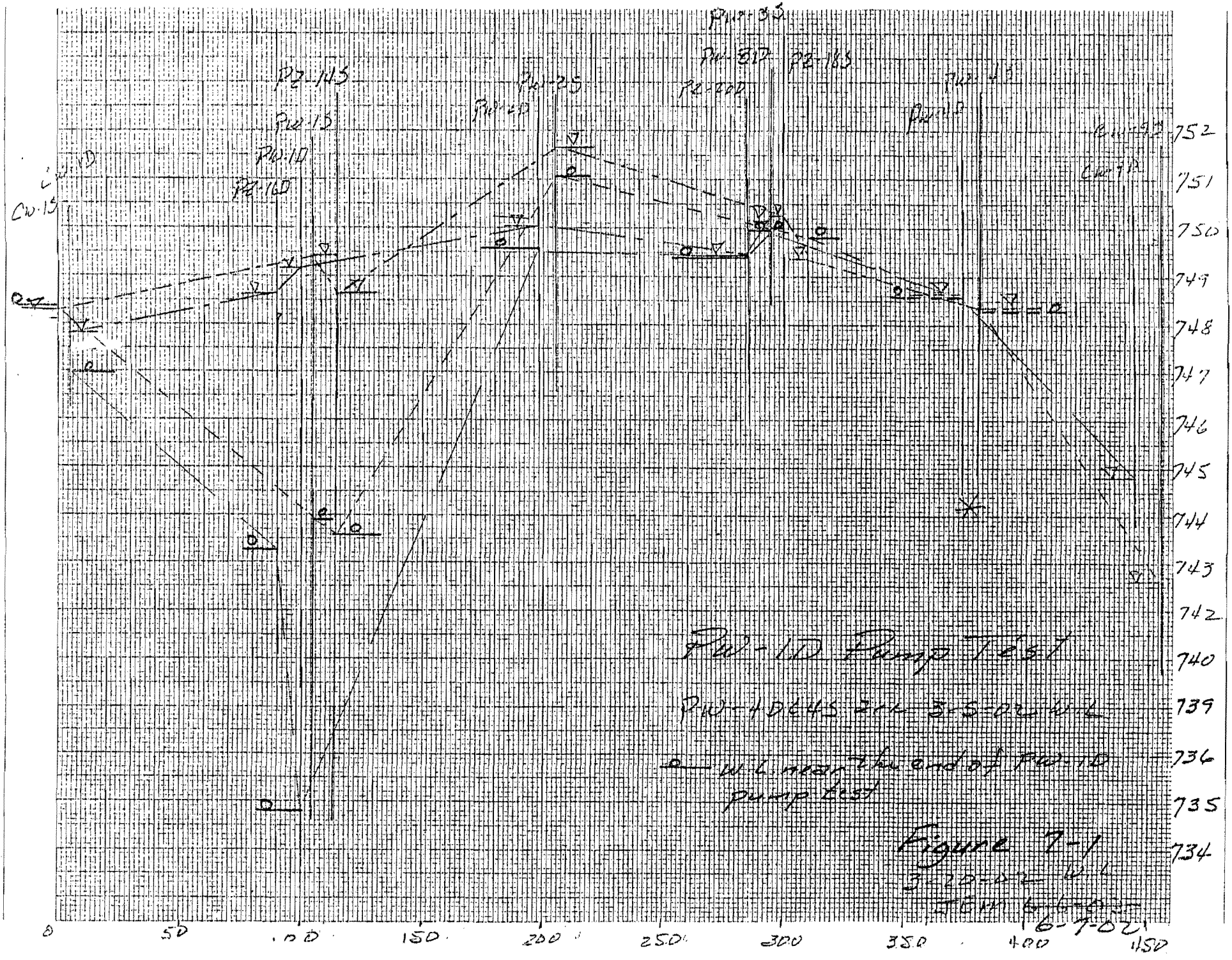
L-345



DEEP ZONE POTENTIOMETRIC MAP
April 2002 Water Levels

Figure 5-7e

JM 7-2-02


Pw-10 Pump Test
Pw-10 645 24 3-5-02 WL
WL near the end of Pw-10 pump test
Figure 7-1
3-29-02 WL
6-7-02
Pz-145
Pz-160
Pz-165
Pw-15
Pw-10
Pw-20
Pw-25
Pw-30
Pw-40
Pw-45
Cw-19
Cw-19
0
50
100
150
200
250
300
350
400
450
734
735
736
739
740
742
743
744
745
746
747
748
749
750
751
752

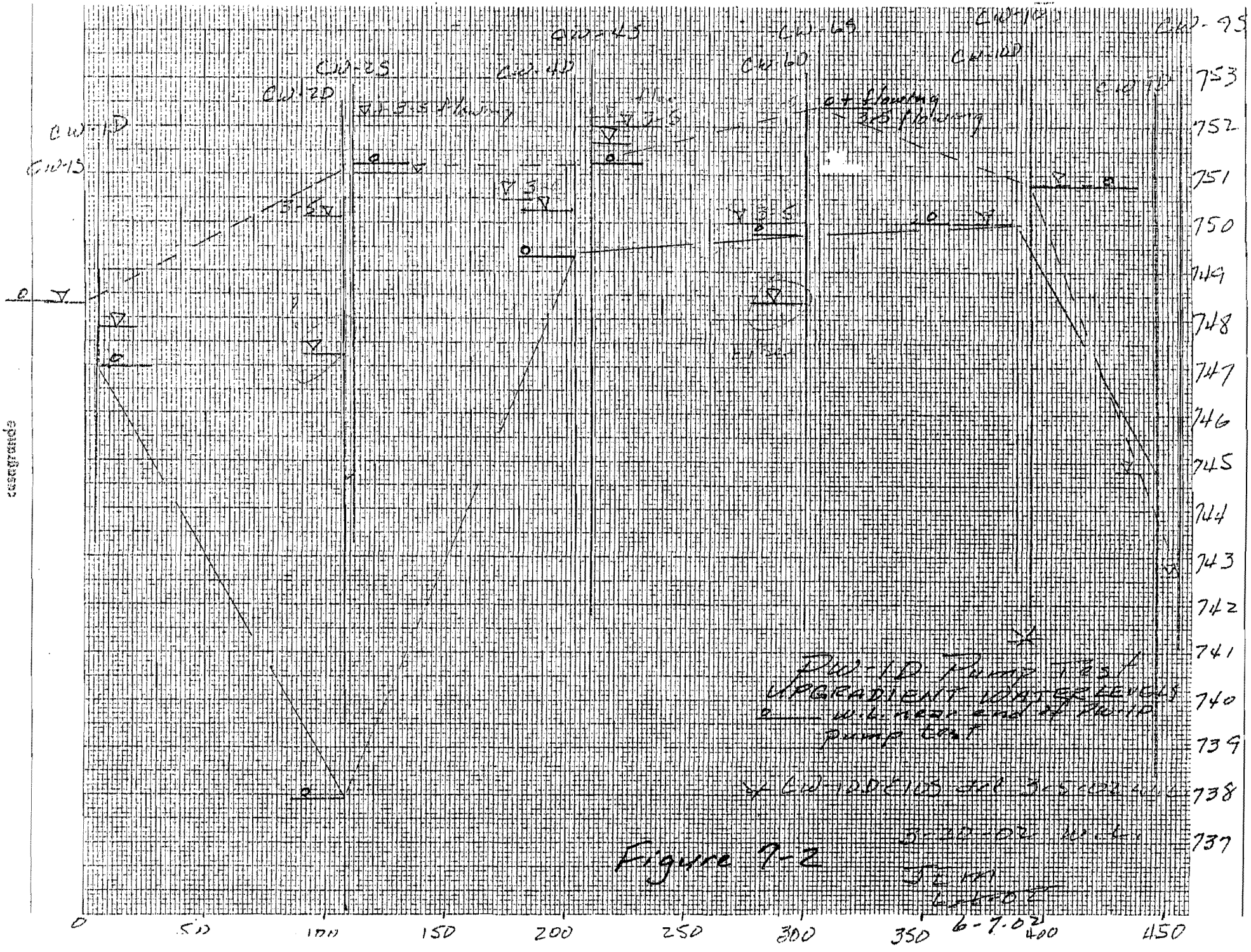
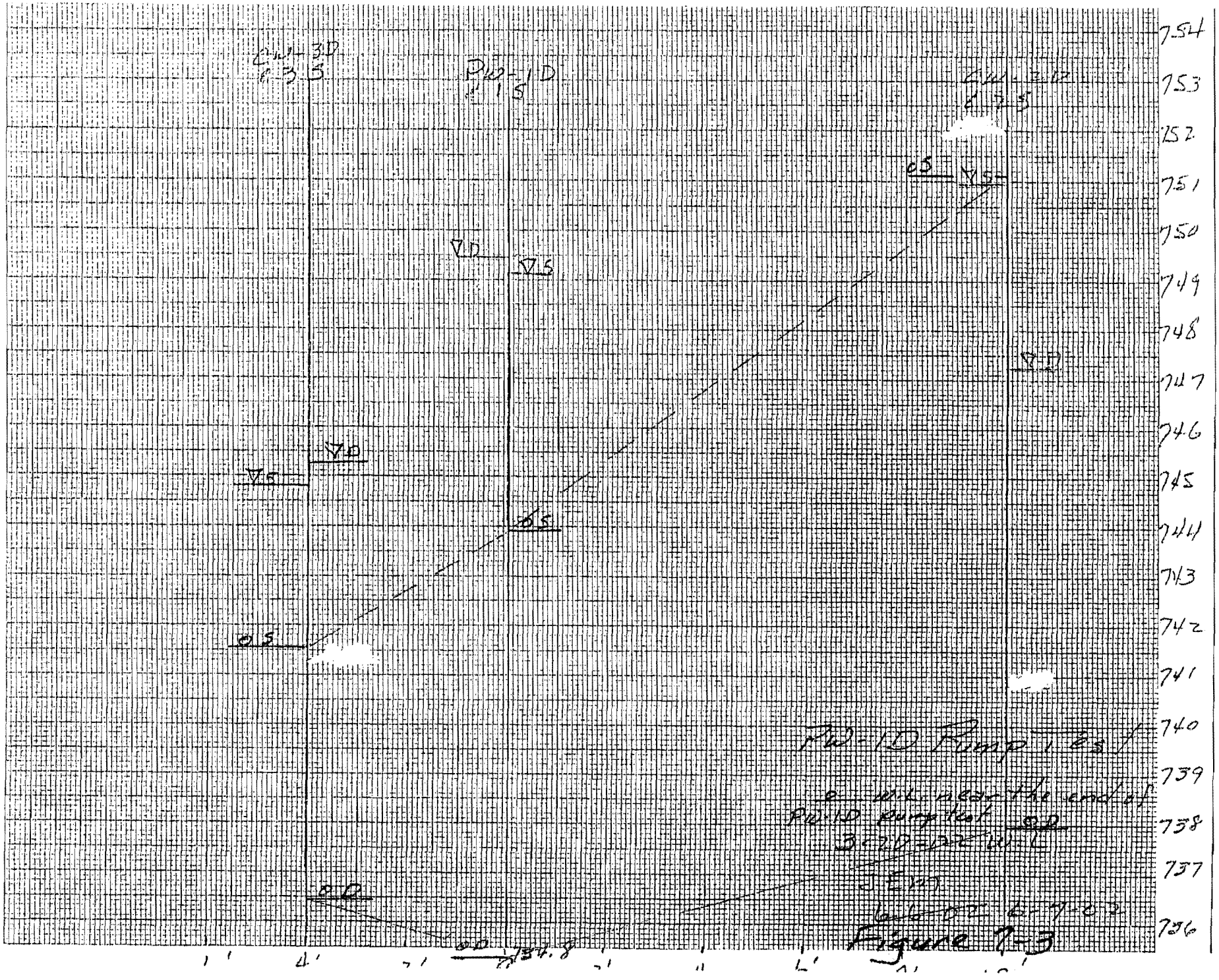


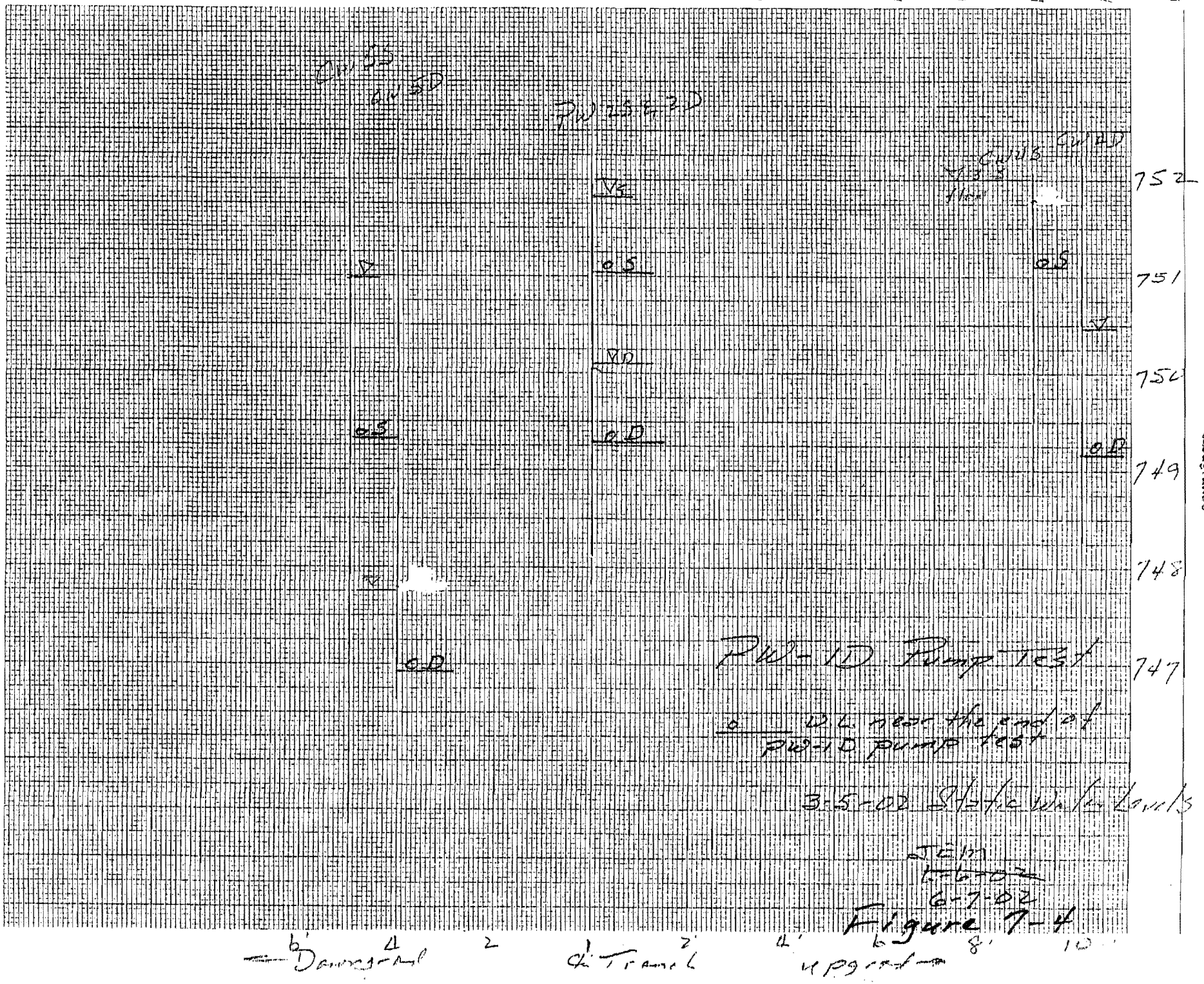
Figure 7-2

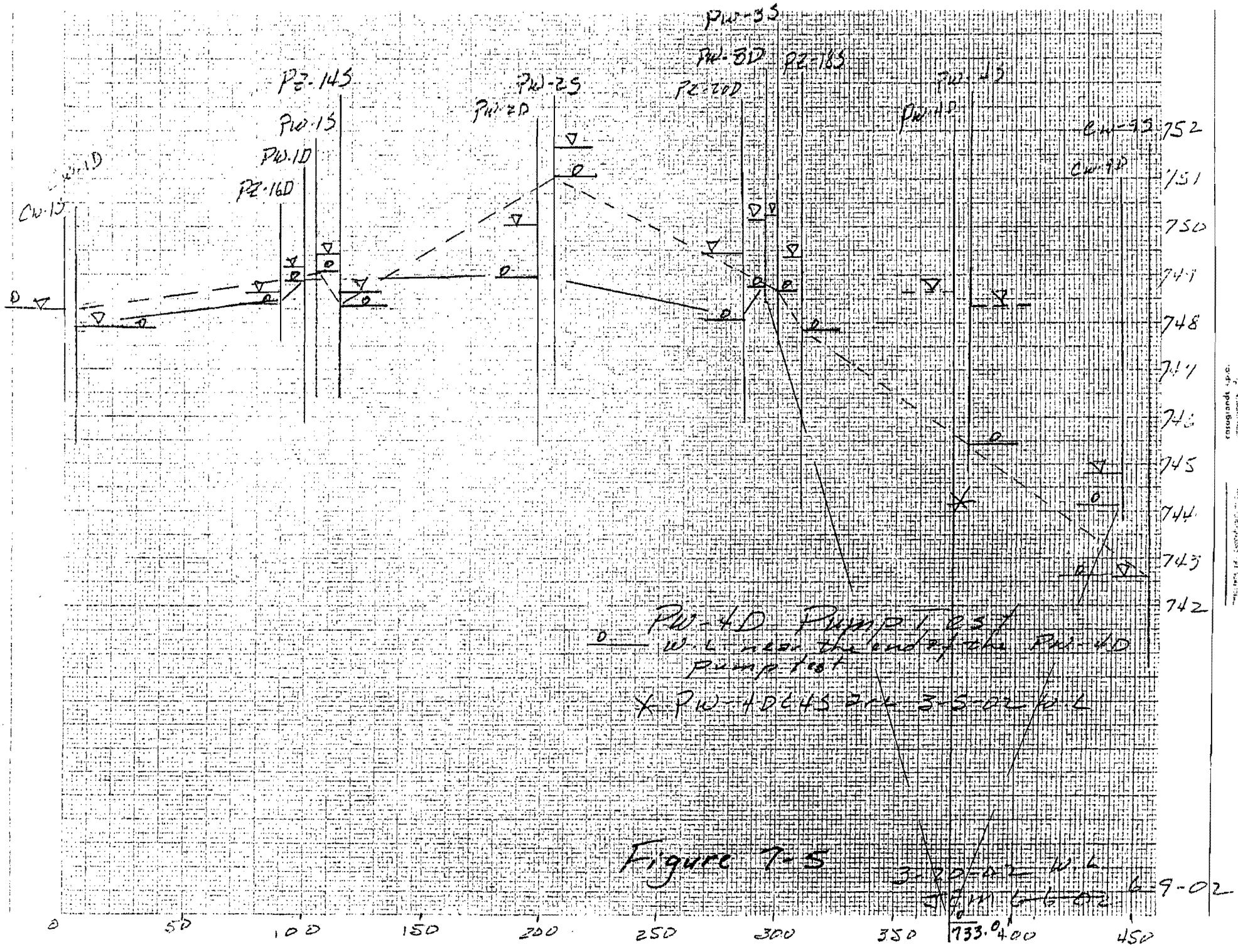
casagrande s.p.a.
viale venezia 97
33072 fiumanfreddo (pn) italia
telefono (0434) 997314-18-19
telex 450673 casagr i
macchine per centrifughe in c.a.
macchine per fondazioni
macchine speciali

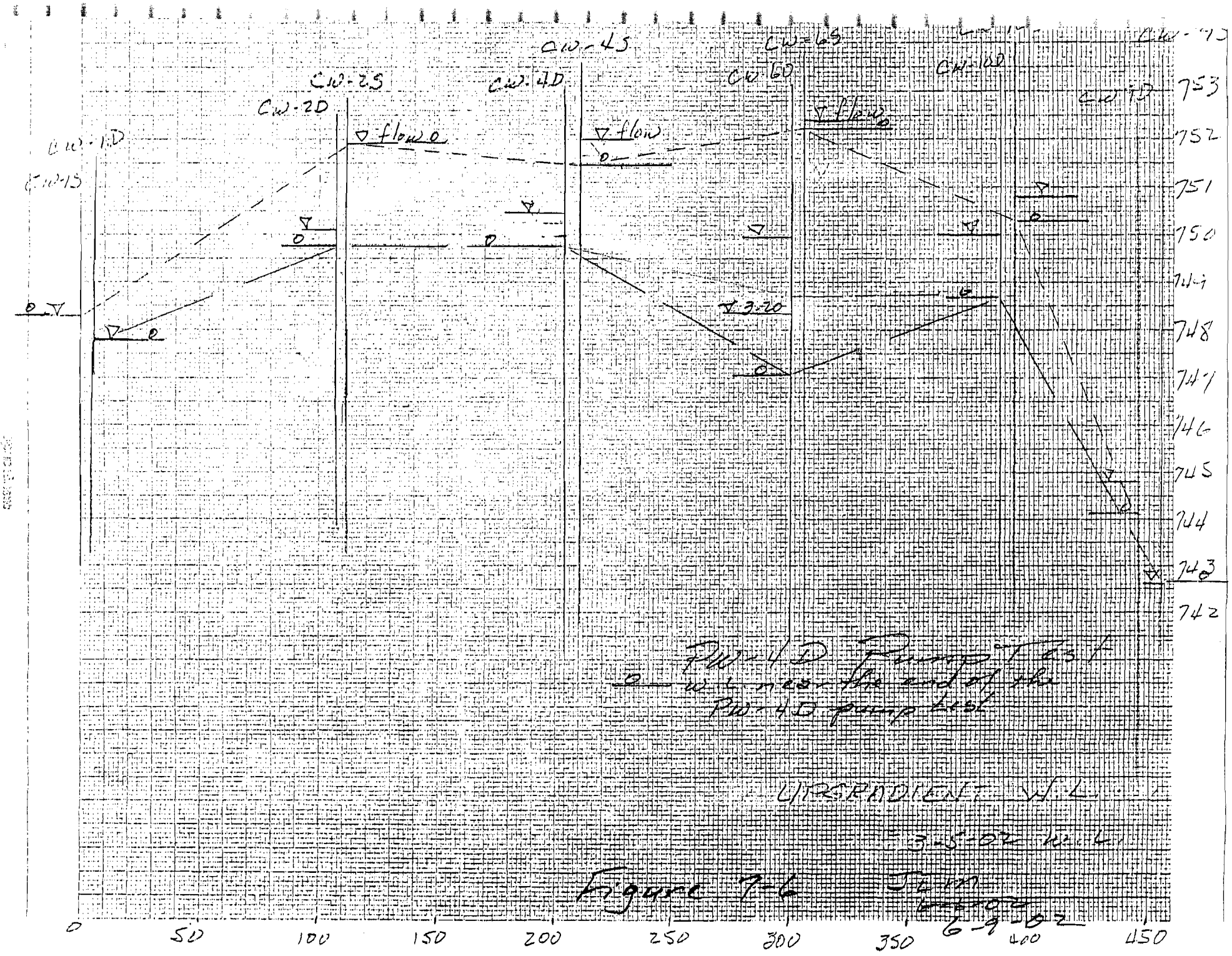


casagrande s.p.a.
viale venezia, 97
33074 fontanafredda (pn) italia
telefono 0434 997116-7-8-9
telex 450973 casag

macchine per centrifugazione
macchine per fondazione
macchine speciali


Cu-1D
Cu-2D
Pw-2S & 2D
Vs
0.5
Vn
0.D
Cu-1S
Cu-1D
Vs
0.5
Vn
0.D
752
751
750
749
748
747
Pw-1D Pump Test
0 W.L. near the end of Pw-1D pump test
3-5-02 Static water levels
Jan 1-6-02
6-7-02
Figure 7-4
Downstream
Trench
upgradient


PW-3S
PW-3D
PZ-18S
PZ-20D
PW-2S
PW-2D
PZ-14S
PW-1S
PW-1D
PZ-16D
CW-1S
PW-4D
CW-4D
752
751
750
749
748
747
746
745
744
743
742
0
50
100
150
200
250
300
350
400
450
733.0
PW-4D Pump Test
W.L. after the end of the PW-4D Pump Test
X PW-4D 645 Pre-3-5-02 W.L.
Figure 7-5
3-20-02 W.L.
3-9-02



PW-4D Pump Test
o — w/ 4 mon. the end of the
PW-4D pump test

UNGRADIENT WELL

3-5-02 to 4-1

Figure 7-6

6-9-02

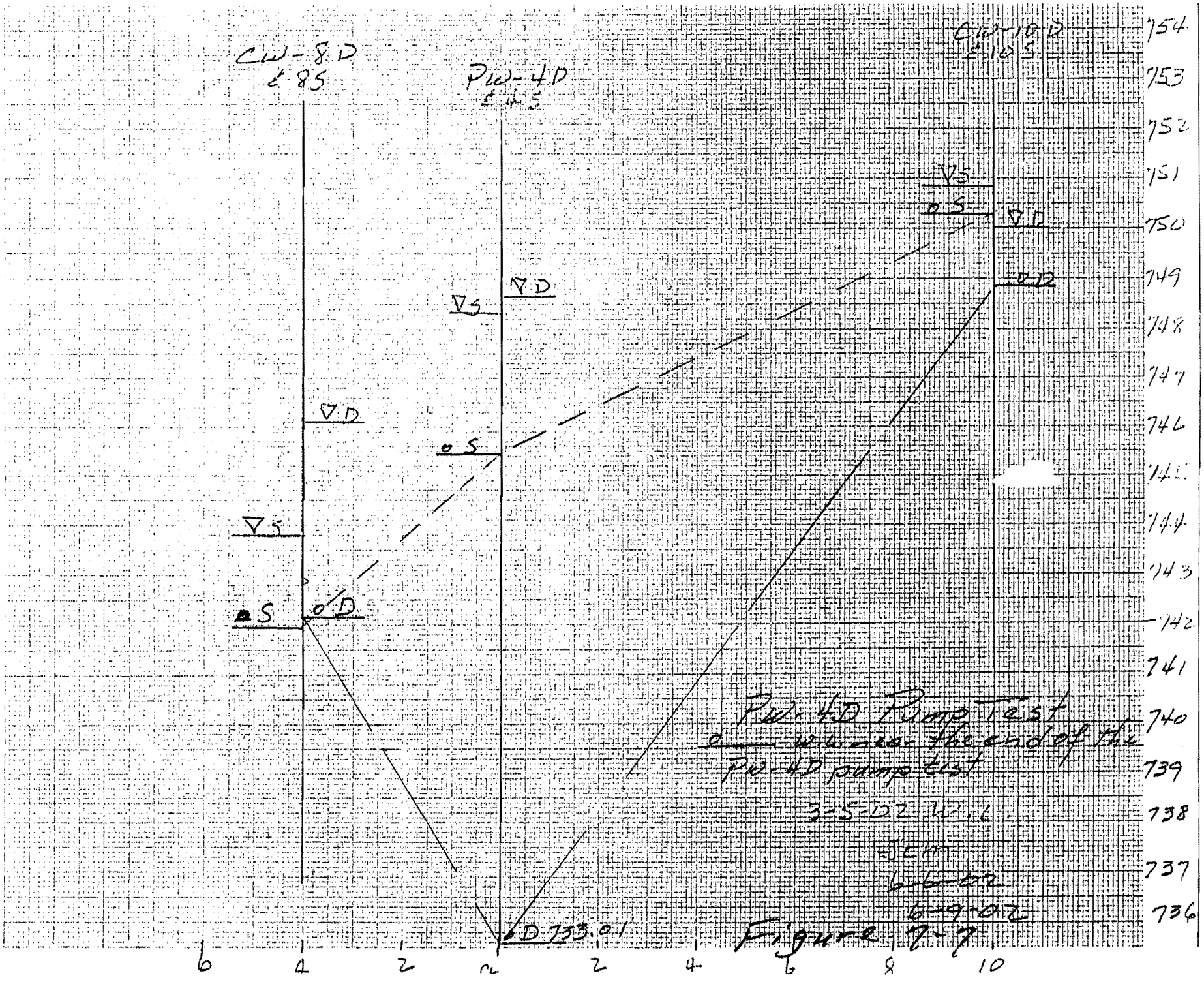
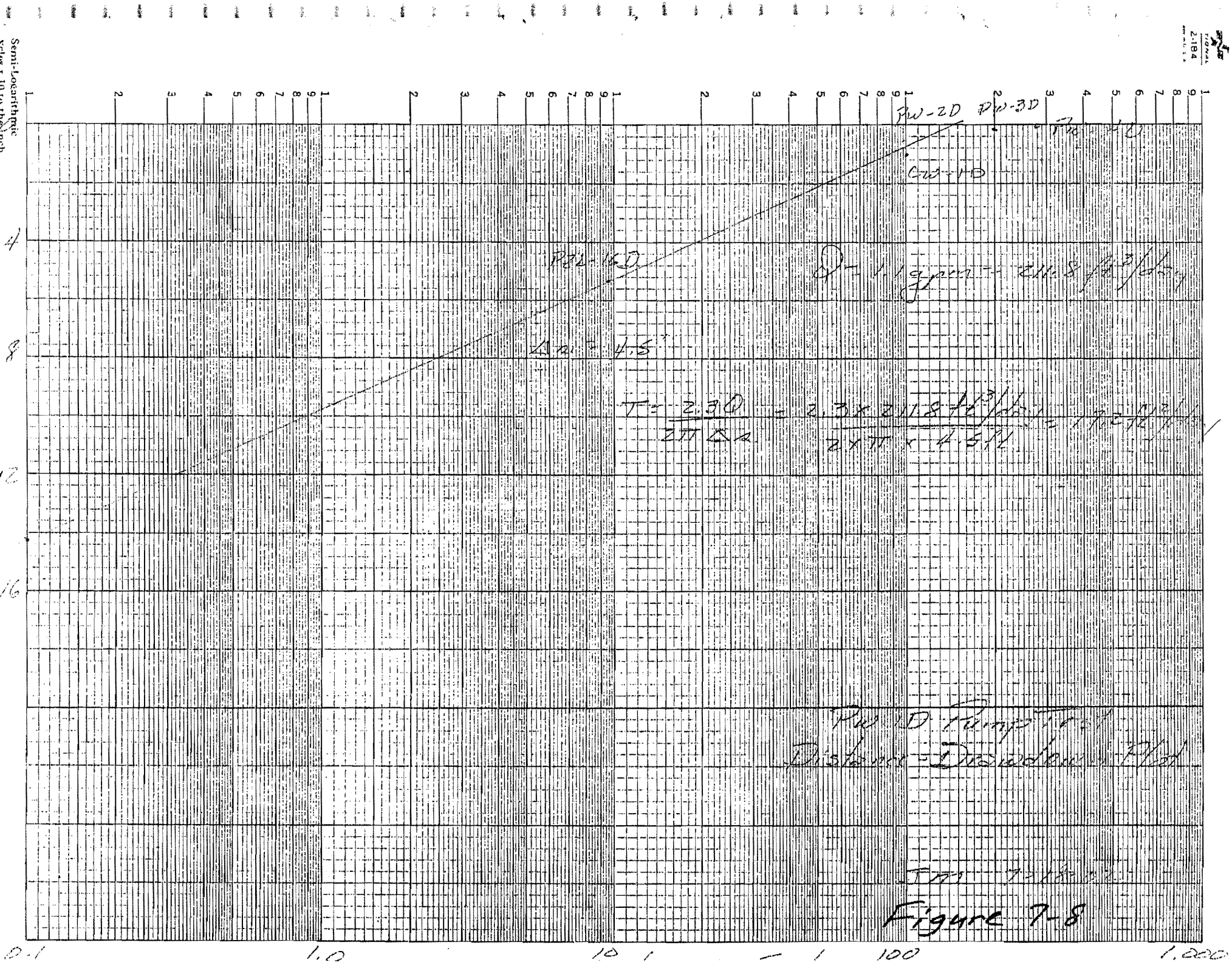
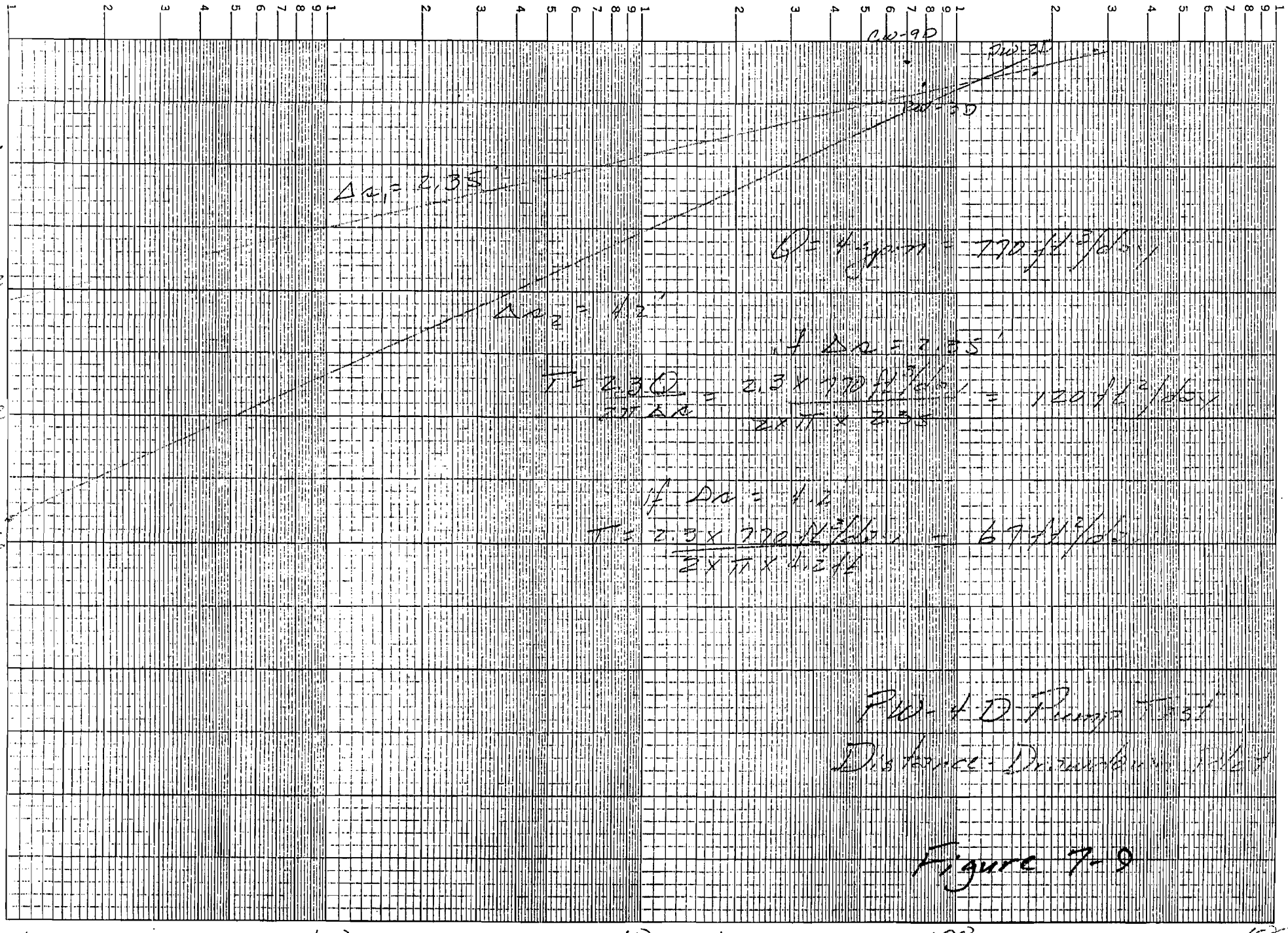

CW-8D
∠85
PW-4D
∠45
CW-19D
∠105
754
753
752
751
750
749
748
747
746
745
744
743
742
741
740
739
738
737
736
▽S
○S
▽D
○D
▽S
○S
▽D
○D
▽S
●S
○D
D 733.01
6
4
2
2
4
6
8
10
PW-4D Pump Test
○ water near the end of the
PW-4D pump test
3-5-02 12:6
-Jem
6-6-02
6-9-02

Figure 7-7


Semi-Logarithmic
Cycles x 10 to the inch
Pw-2D
Pw-3D
Pw-1D
Pw-4D
Q = 1.1 gpm = 211.8 ft³/day
Δr = 4.5'
T = 2.3Q / 2πΔr = 2.3 × 211.8 ft³/day / 2 × π × 4.5 ft = 19.2 ft²/day
Pw 1D Temporal
Distance - Drawdown Plot
Figure 7-8
0.1
1.0
10
100
1,000


Semi-Logarithmic
4 Cycles x 10 to the inch
Pw-9D
Pw-2D
Pw-3D
Δs₁ = 2.35'
Q = Figure = 770 ft³/hr
Δs₂ = 4.2'
If Δs = 2.35'
T = 2.3Q / 2πΔs = 2.3 x 770 ft³/hr / 2 x π x 2.35' = 120 ft²/day
If Δs = 4.2'
T = 2.3 x 770 ft³/hr / 2 x π x 4.2' = 67 ft²/day
Pw-4D Pump Test
Distance-Drawdown Data
Figure 7-9

$t_0 = 390$ min. = 0.27 days

$r = 100.4$ feet $\qquad s_0 = 1.2$

$Q = 1$ gpm $= 24.8$ ft^3/day

$$T = \frac{2.3 \times 24.8 \text{ ft}^3/\text{day}}{4 \times \pi \times 1.2 \text{ ft}} = 32.3 \text{ ft}^2/\text{day}$$

if $b = 44'$ $\quad K = \dfrac{32.3 \text{ ft}^2/\text{day}}{44 \text{ ft}} = 0.73$ ft/ft

$= 2.6 \times 10^{-4}$ cm/sec

$$S = \frac{2.25 T t_0}{r^2} = \frac{2.25 \times 32.3 \text{ ft}^2/\text{day} \times 0.27 \text{ day}}{(100.4)^2} = 0.002$$

PW = 1D Pump Test
CW = 1D data

Jim 6-22-02

Figure 7-10

100 1000

T . . m . . t . .

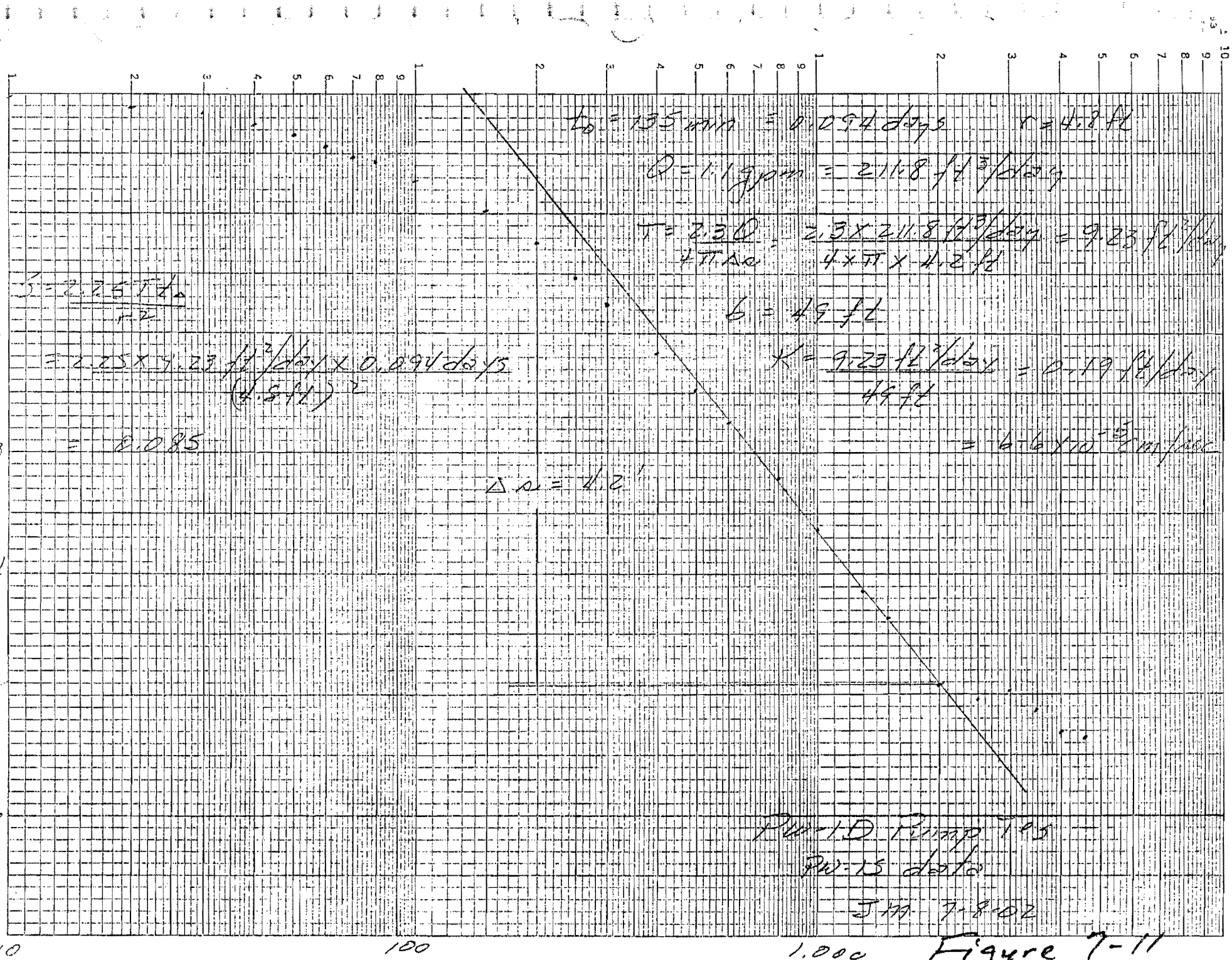

$t_0 = 135$ min $= 0.094$ days
$r = 4.8$ ft
$Q = 1.1$ gpm $= 211.8$ ft³/day
$T = \frac{2.3Q}{4\pi\Delta s} = \frac{2.3 \times 211.8 \text{ ft}^3/\text{day}}{4 \times \pi \times 4.2 \text{ ft}} = 9.23$ ft²/day
$b = 49$ ft
$K = \frac{9.23 \text{ ft}^2/\text{day}}{49 \text{ ft}} = 0.19$ ft/day
$= 6.6 \times 10^{-5}$ cm/sec
$S = \frac{2.25 T t_0}{r^2}$
$= \frac{2.25 \times 9.23 \text{ ft}^2/\text{day} \times 0.094 \text{ days}}{(4.8 \text{ ft})^2}$
$= 0.085$
$\Delta s = 4.2'$
PW-1D Pump 195
PW-15 data
JM 7-8-02
10
100
1,000

Figure 7-11

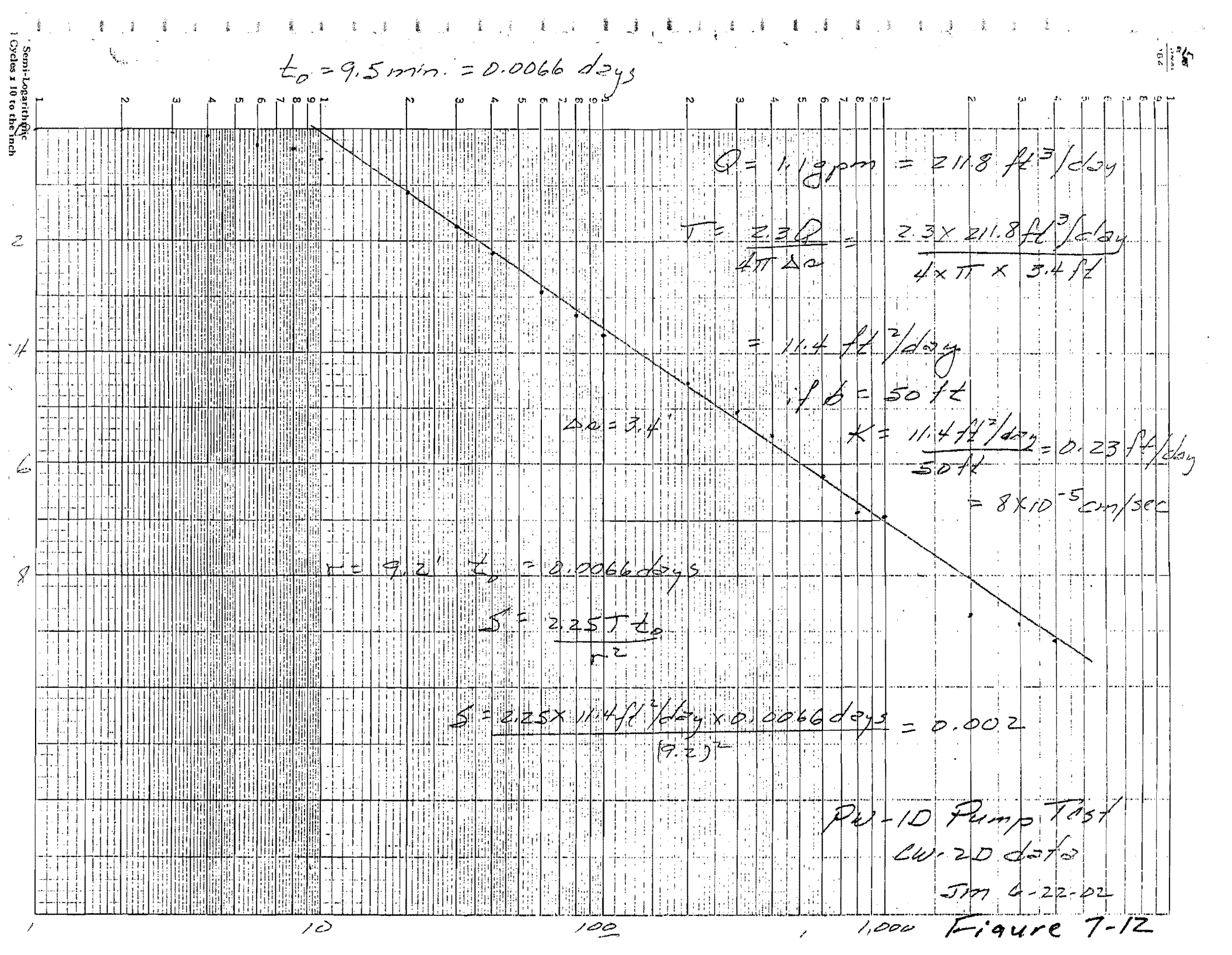

Semi-Logarithmic
1 Cycles x 10 to the inch
$t_o = 9.5$ min. $= 0.0066$ days
$Q = 1.1$ gpm $= 211.8$ ft^3/day
$T = \frac{2.3Q}{4\pi\Delta s} = \frac{2.3 \times 211.8 \text{ ft}^3/\text{day}}{4 \times \pi \times 3.4 \text{ ft}}$
$= 11.4$ ft^2/day
if $b = 50$ ft
$\Delta s = 3.4'$
$K = \frac{11.4 \text{ ft}^2/\text{day}}{50 \text{ ft}} = 0.23$ ft/day
$= 8 \times 10^{-5}$ cm/sec
$r = 9.2'$ $t_o = 0.0066$ days
$S = \frac{2.25 T t_o}{r^2}$
$S = \frac{2.25 \times 11.4 \text{ ft}^2/\text{day} \times 0.0066 \text{ days}}{(9.2)^2} = 0.002$
PW-1D Pump Test
CW-2D data
JTM 4-22-02
1
10
100
1,000

Figure 7-12

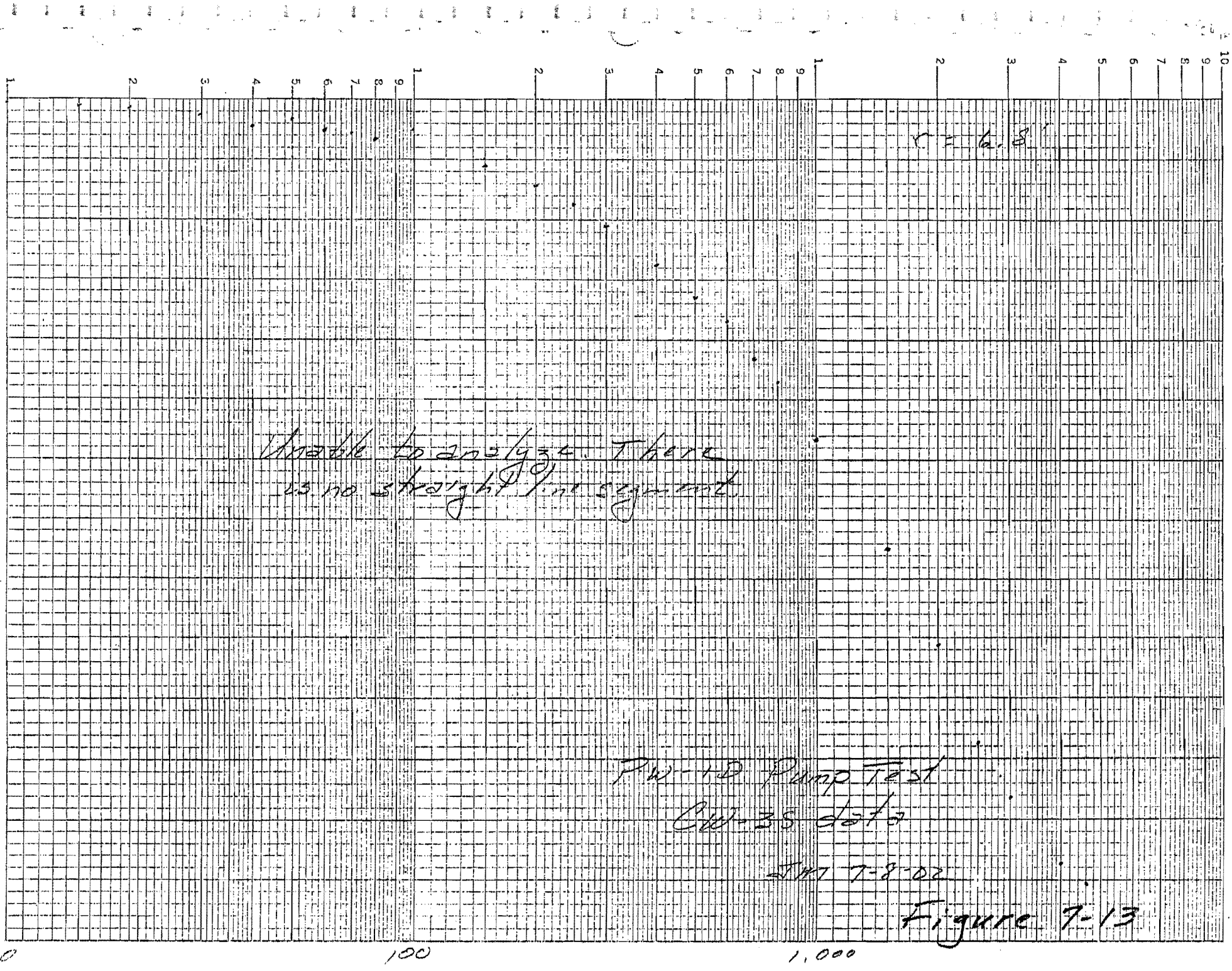
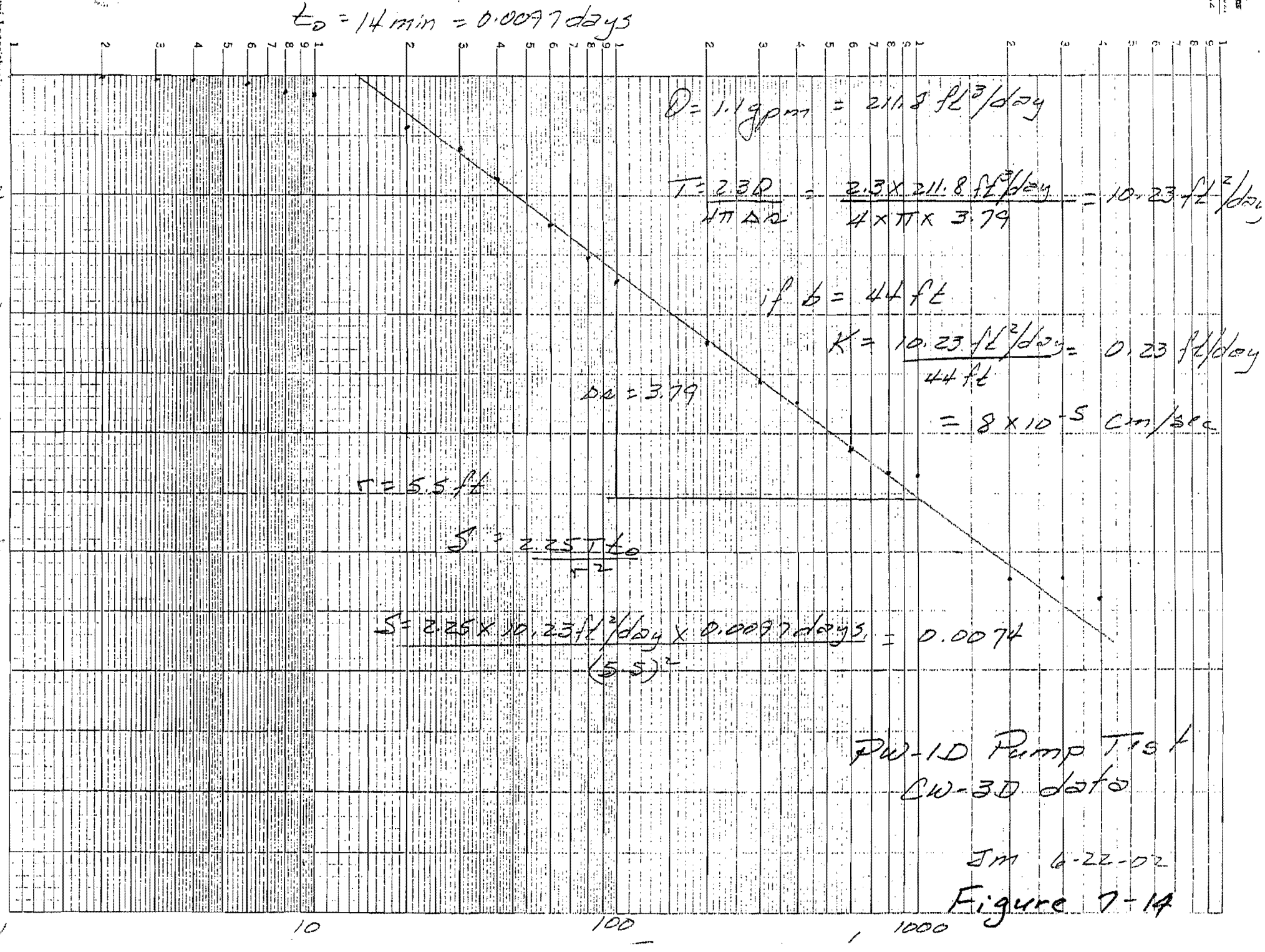

r = 6.8'
Unable to analyze. There is no straight line segment.
PW-1D Pump Test
CW-35 data
JM 7-8-02
10
100
1,000

Figure 7-13


Semi-Logarithmic
Cycles x 10 to the inch
t_o = 14 min = 0.0097 days
Q = 1.1 gpm = 211.8 ft³/day
T = 2.3Q / 4πΔs = 2.3 x 211.8 ft³/day / 4 x π x 3.79 = 10.23 ft²/day
if b = 44 ft
K = 10.23 ft²/day / 44 ft = 0.23 ft/day
= 8 x 10⁻⁵ cm/sec
Δs = 3.79
r = 5.5 ft
S = 2.25 T t_o / r²
S = 2.25 x 10.23 ft²/day x 0.0097 days / (5.5)² = 0.0074
PW-1D Pump Test
CW-3D data
JM 6-22-02
Figure 7-14
10
100
1000

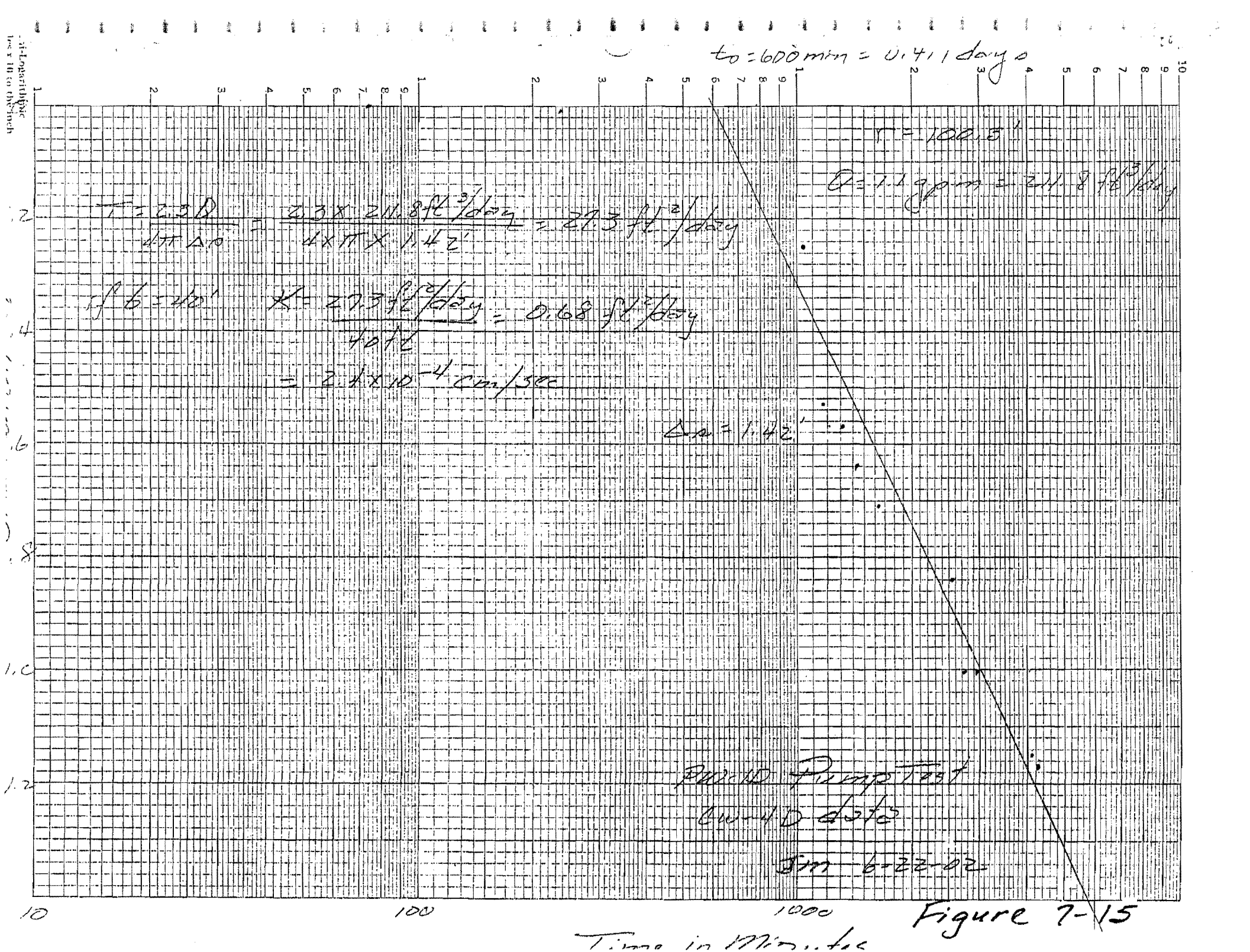

to = 600 min = 0.41 days
T = 100.5'
Q = 1.1 gpm = 21.8 ft³/day
T = 2.3Q / 4πΔs = 2.3 × 21.8 ft³/day / 4 × π × 1.42' = 27.3 ft²/day
ft b = 40'
K = 27.3 ft²/day / 40 ft = 0.68 ft/day
= 2.4 × 10⁻⁴ cm/sec
Δs = 1.42'
Pump Test
Cu-4D data
JM 6-22-02
10
100
1000
Time in Minutes

Figure 7-15

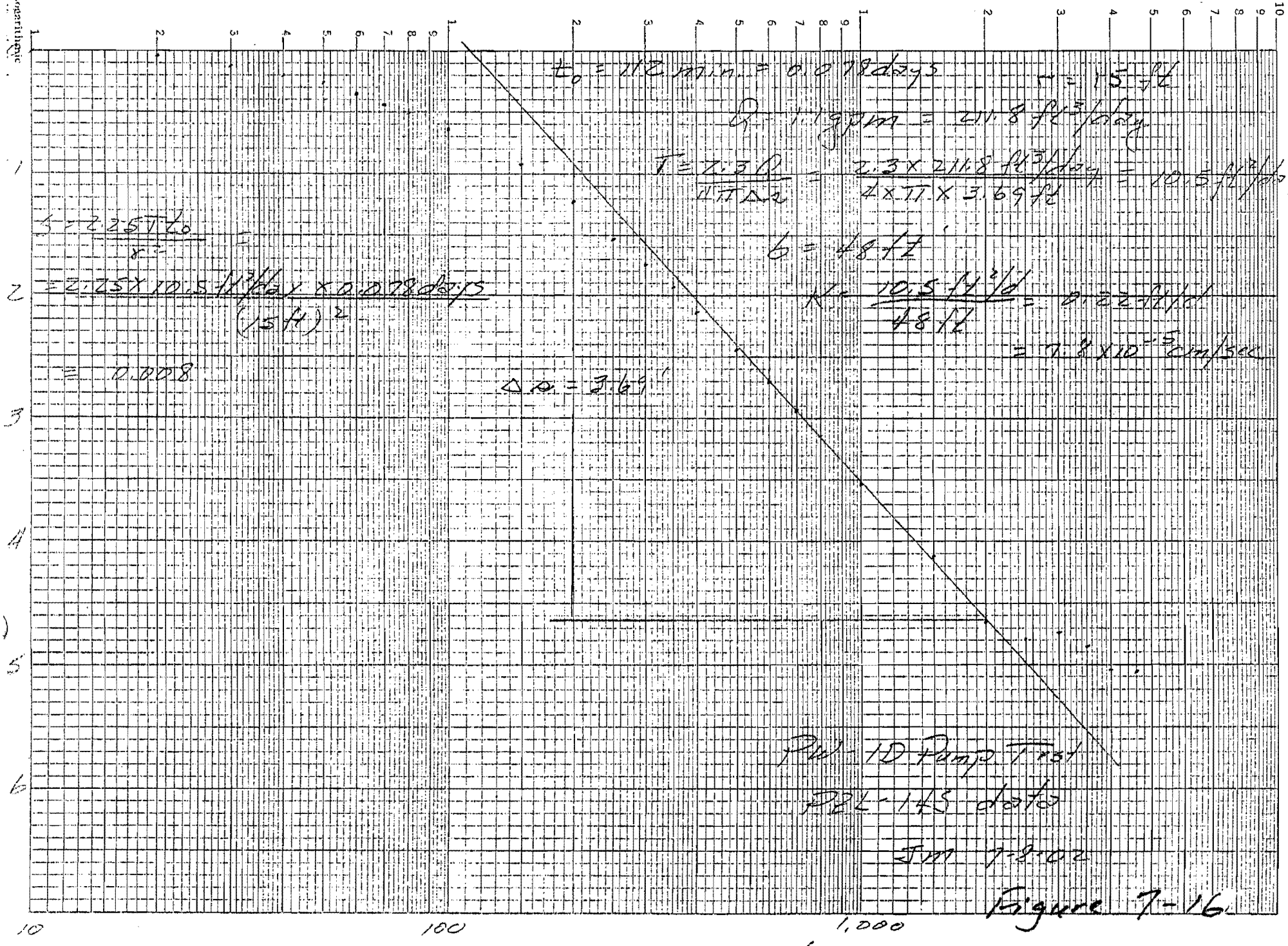
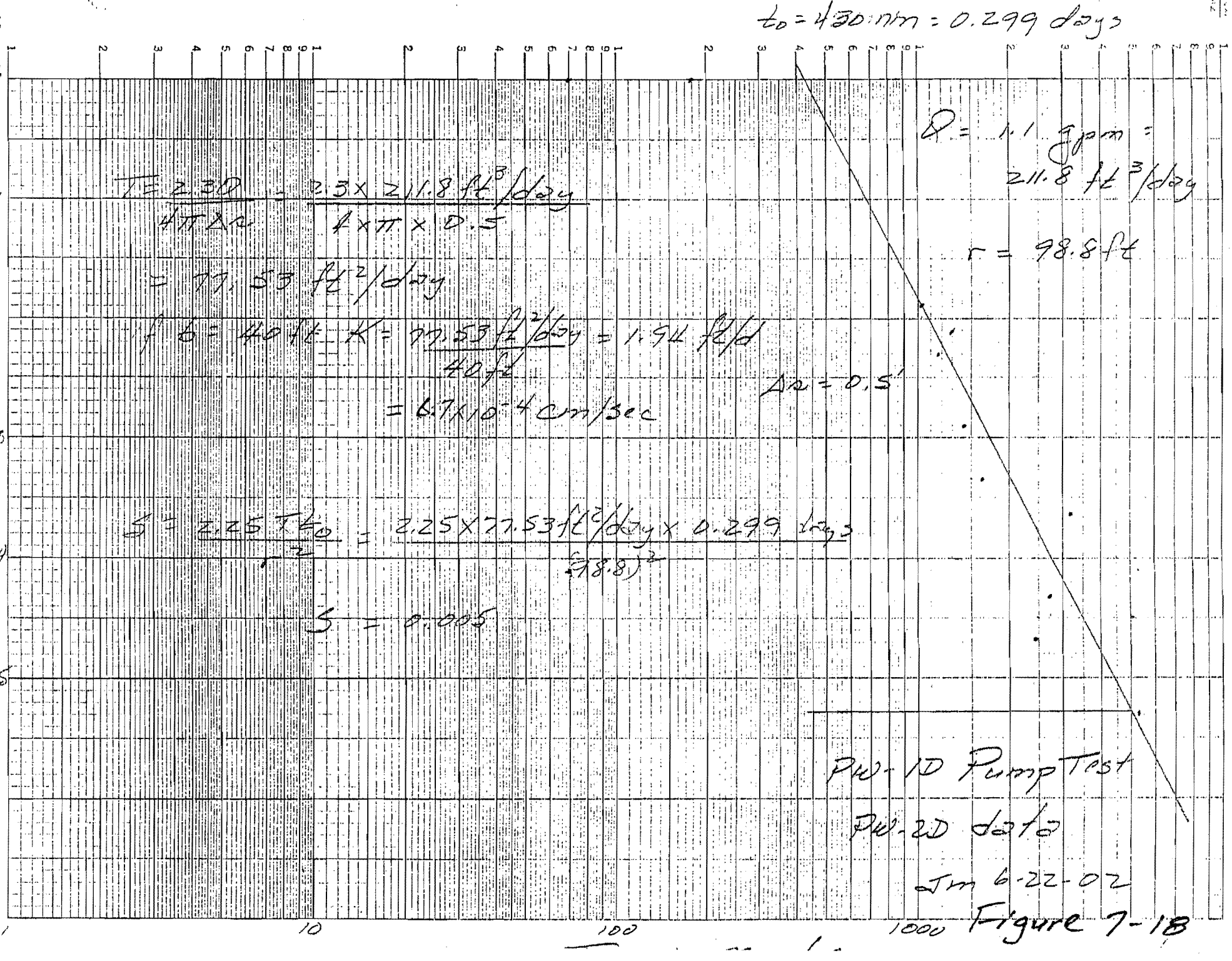
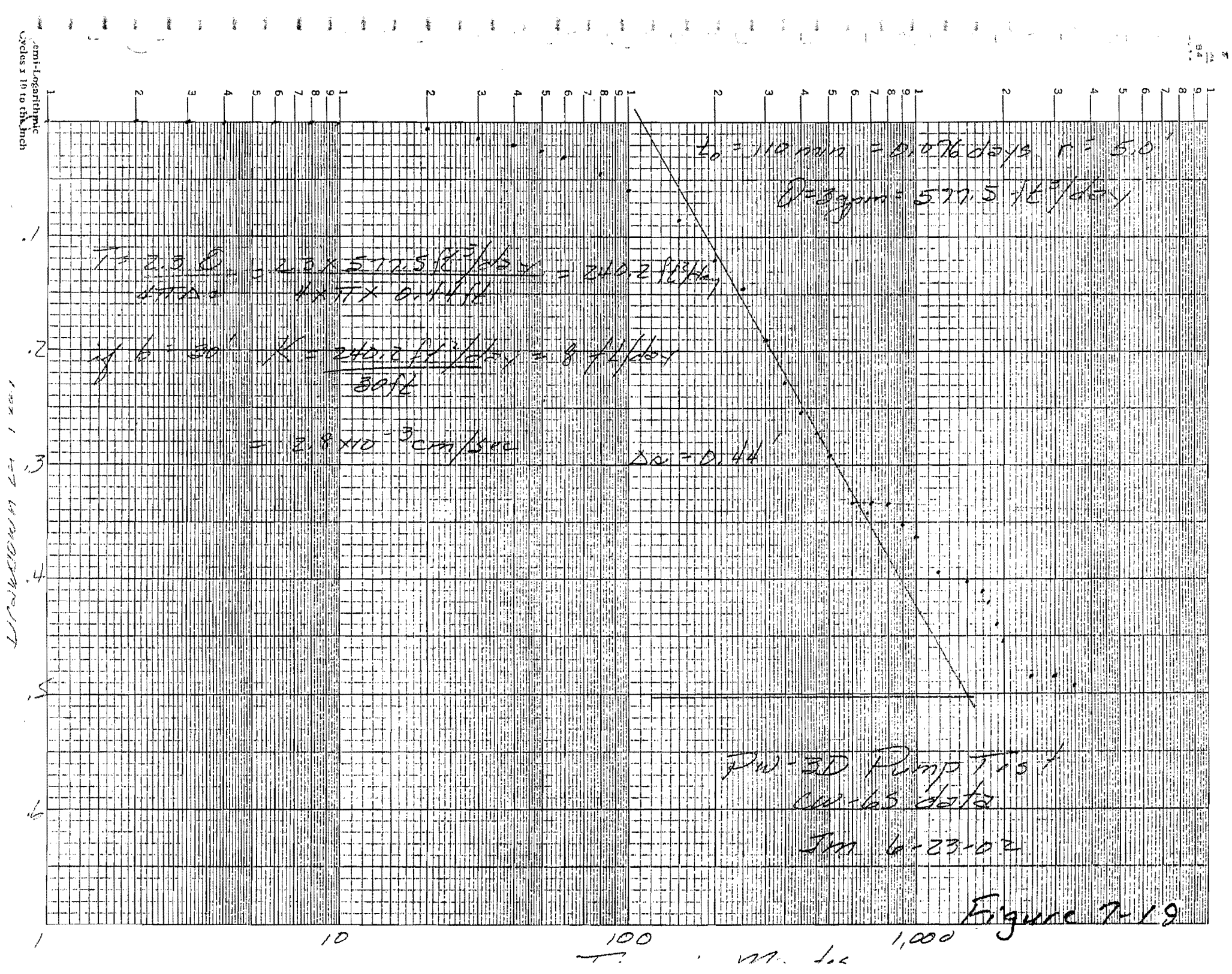
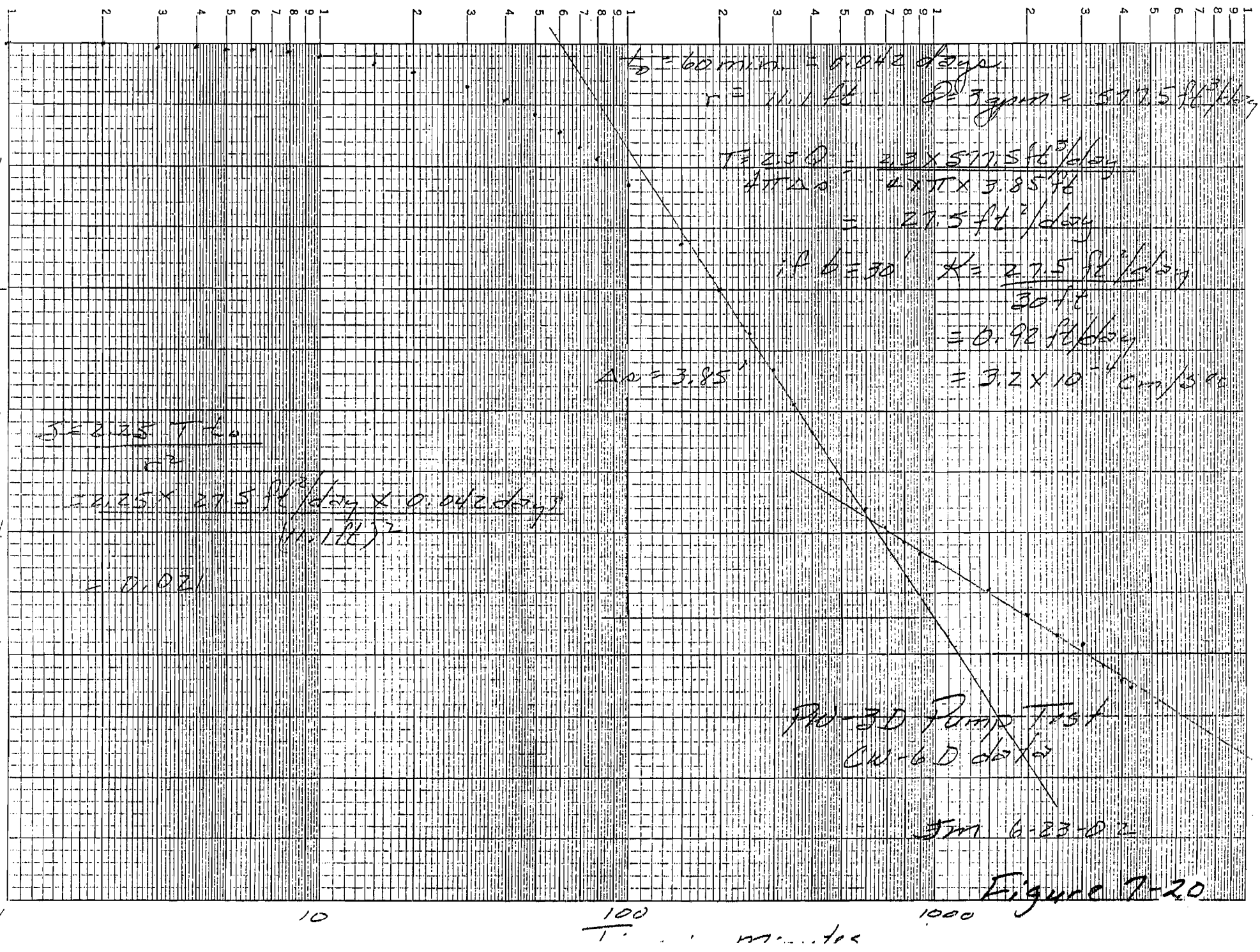

$t_0 = 112$ min. $= 0.078$ days
$r = 15$ ft
$Q = 1.9$ gpm $= 211.8$ ft³/day
$T = \frac{2.3Q}{4\pi\Delta s} = \frac{2.3 \times 211.8 \text{ ft}^3/\text{day}}{4 \times \pi \times 3.69 \text{ ft}} = 10.5$ ft²/day
$b = 48$ ft
$K = \frac{10.5 \text{ ft}^2/\text{d}}{48 \text{ ft}} = 0.22$ ft/d
$= 7.8 \times 10^{-5}$ cm/sec
$S = \frac{2.25Tt_0}{r^2} = \frac{2.25 \times 10.5 \text{ ft}^2/\text{d} \times 0.078 \text{ days}}{(15 \text{ ft})^2}$
$= 0.008$
$\Delta s = 3.69'$
PW-10 Pump Test
PZ-145 data
Jan 7-8-02
Non-Logarithmic
10
100
1,000
T - in minutes

Figure 7-16


Semi-Logarithmic
1 Cycles x 10 to the inch
$t_o = 430\ min = 0.299\ days$
$Q = 1.1\ gpm = 211.8\ ft^3/day$
$r = 98.8\ ft$
$T = \frac{2.30}{4\pi\Delta s} = \frac{2.5 \times 211.8\ ft^3/day}{4 \times \pi \times 0.5}$
$= 77.53\ ft^2/day$
$b = 40\ ft \quad K = \frac{77.53\ ft^2/day}{40\ ft} = 1.94\ ft/d$
$= 6.7 \times 10^{-4}\ cm/sec$
$\Delta s = 0.5'$
$S = \frac{2.25\ T t_o}{r^2} = \frac{2.25 \times 77.53\ ft^2/day \times 0.299\ days}{(98.8)^2}$
$S = 0.005$
PW-1D Pump Test
PW-2D data
JM 6-22-02
Figure 7-18


Semi-Logarithmic
Cycles x 10 to the inch
t_0 = 110 min = 0.076 days r = 5.0'
Q = 3 gpm = 577.5 ft³/day
T = 2.3 Q / 4πΔs = 2.3 × 577.5 ft³/day / 4 × π × 0.44 ft = 240.2 ft²/day
if b = 30' K = 240.2 ft²/day / 30 ft = 8 ft/day
= 2.8 × 10⁻³ cm/sec
Δs = 0.44'
Pw-5D Pump Test
Cu-65 data
Jan 6-23-02
Figure 7-19
10
100
1,000


Semi-Logarithmic
Cycles x 10 to the inch
t_0 = 60 mins = 0.042 days
r = 11.1 ft
Q = 3 gpm = 577.5 ft³/day
$T = \frac{2.3Q}{4\pi\Delta s} = \frac{2.3 \times 577.5 \text{ ft}^3/\text{day}}{4 \times \pi \times 3.85 \text{ ft}}$
= 27.5 ft²/day
if b = 30' K = 27.5 ft²/day / 30 ft
= 0.92 ft/day
= 3.2 × 10⁻⁴ cm/sec
Δs = 3.85'
$S = \frac{2.25 T t_0}{r^2}$
$= \frac{2.25 \times 27.5 \text{ ft}^2/\text{day} \times 0.042 \text{ days}}{(11.1 \text{ ft})^2}$
= 0.021
PW-3D Pump Test
OW-6D data
JTM 6-23-02
Figure 7-20
10
100
1000
T minutes

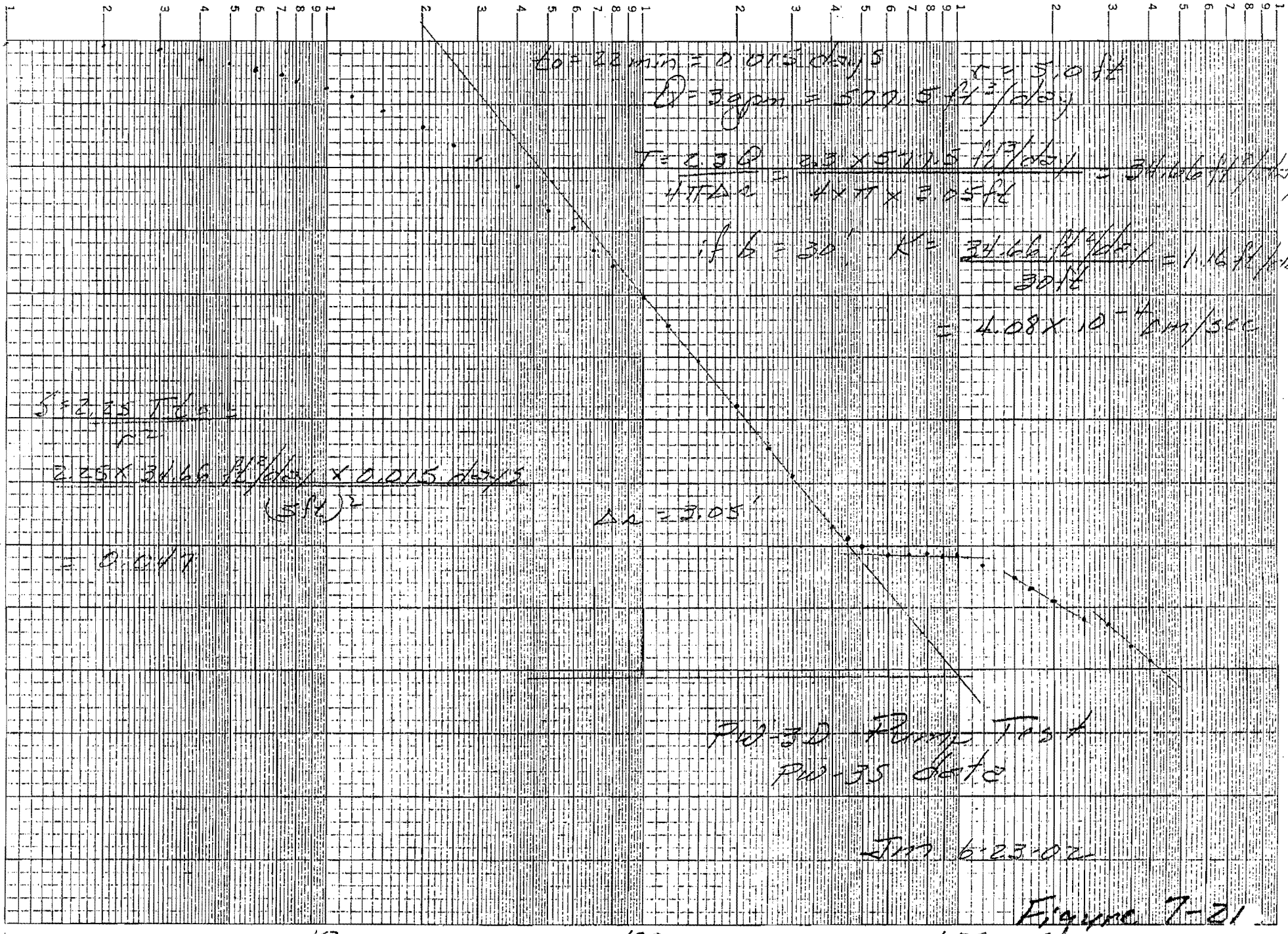


Figure 7-21

Semi-Logarithmic
Cycles x 10 to the inch

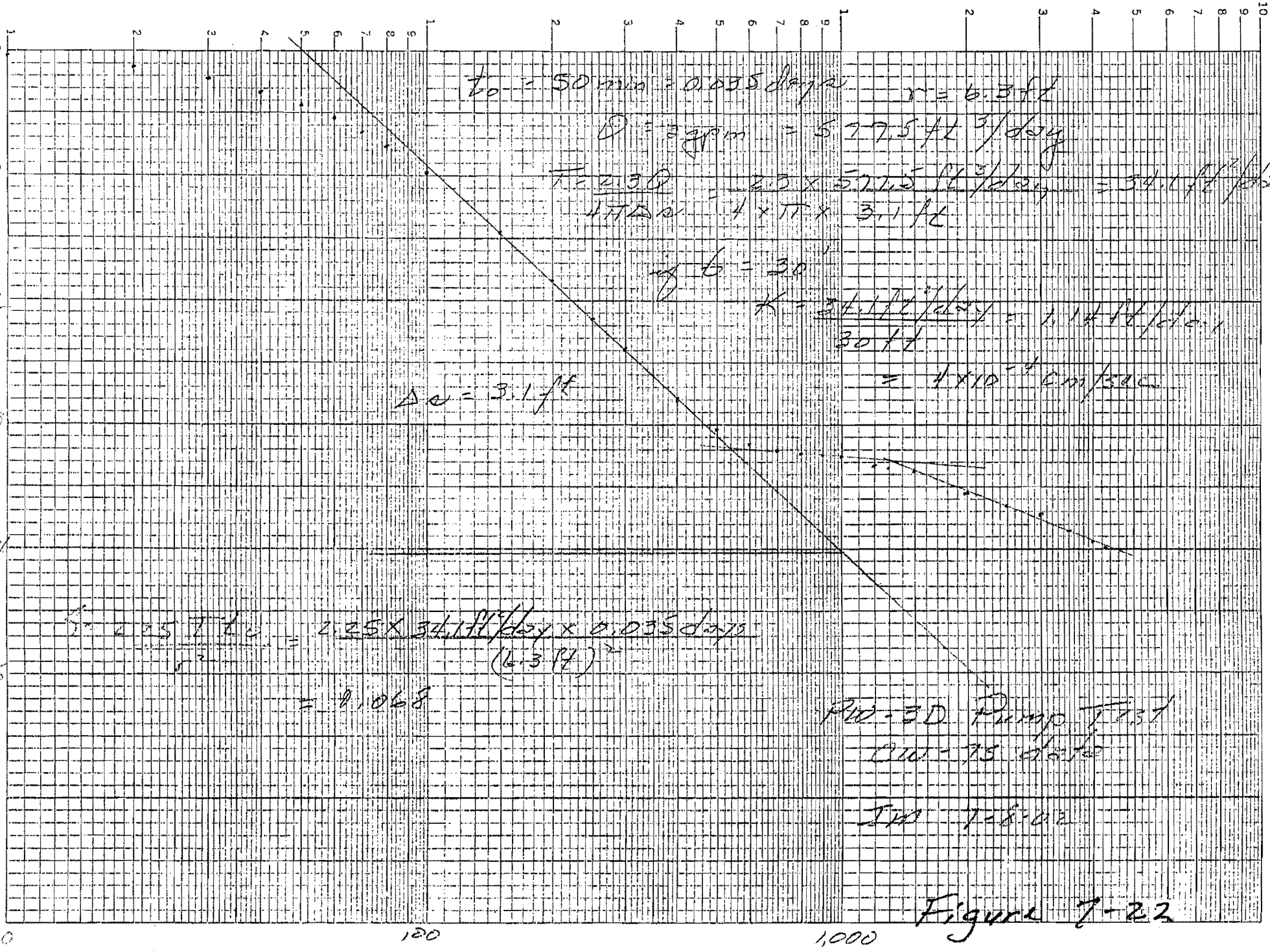

$t_0 = 50$ min $= 0.035$ days
$r = 6.3$ ft
$Q = 3$ gpm $= 577.5$ ft^3/day
$T = \frac{2.3Q}{4\pi\Delta s} = \frac{2.3 \times 577.5 \text{ ft}^3/\text{day}}{4 \times \pi \times 3.1 \text{ ft}} = 34.1$ ft^2/day
$b = 30$ ft
$K = \frac{34.1 \text{ ft}^2/\text{day}}{30 \text{ ft}} = 1.1$ ft/day
$= 4 \times 10^{-4}$ cm/sec
$\Delta s = 3.1$ ft
$S = \frac{2.25 T t_0}{r^2} = \frac{2.25 \times 34.1 \text{ ft}^2/\text{day} \times 0.035 \text{ days}}{(6.3 \text{ ft})^2}$
$= 0.068$
Pump Test
Date - 75 data
Time Test - 0.2
100
1,000
Time in min

Figure 7-22

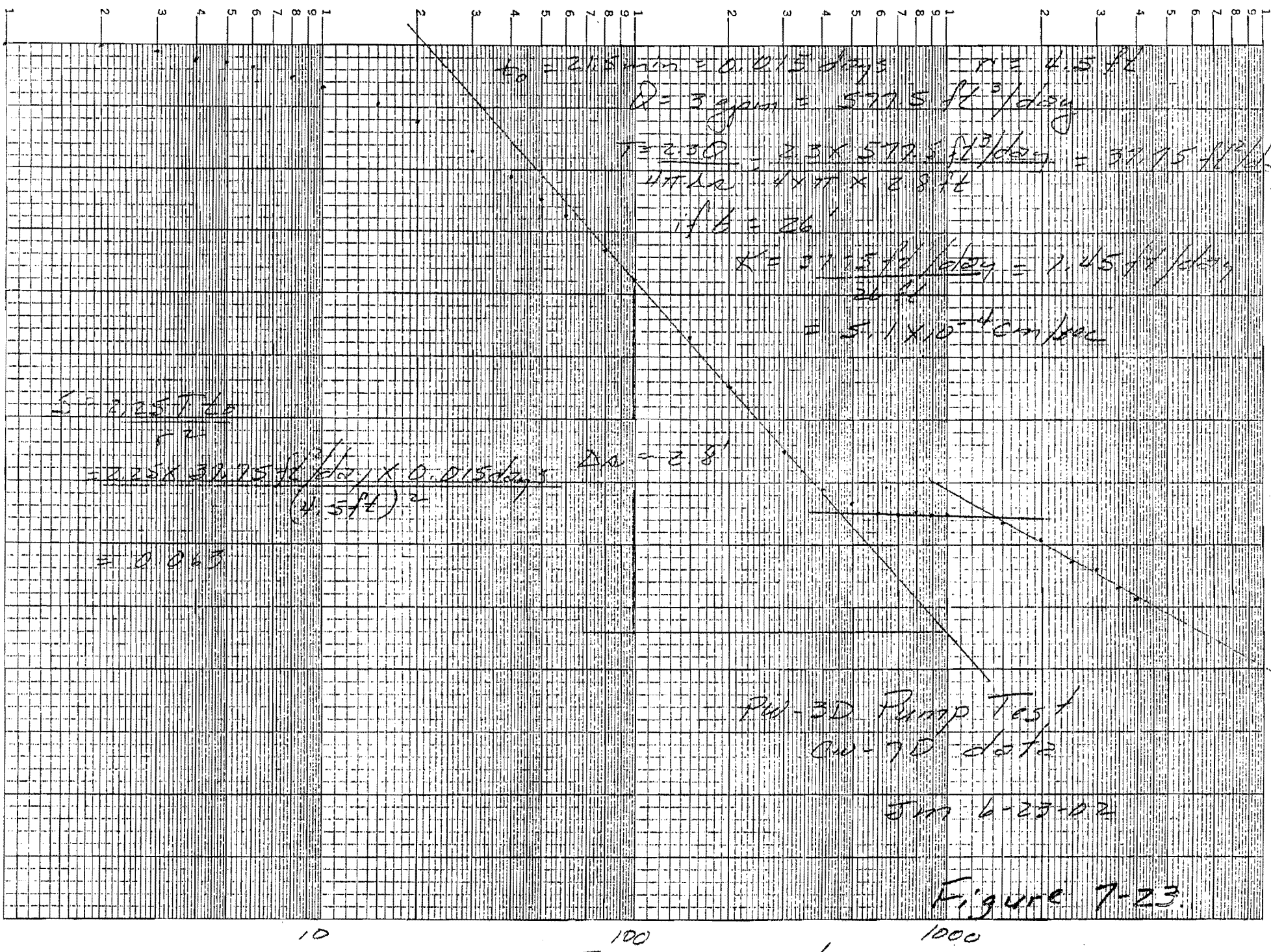

t_0 = 21.5 min = 0.015 days
r = 4.5 ft
Q = 3 gpm = 577.5 ft³/day
T = 2.3Q / 4πΔs = 2.3 × 577.5 ft³/day / 4 × π × 2.8 ft = 37.75 ft²/day
if b = 26'
K = 37.75 ft²/day / 26 ft = 1.45 ft/day
= 5.1 × 10⁻⁴ cm/sec
S = 2.25 T t₀ / r²
= 2.25 × 32.25 ft²/day × 0.015 days / (4.5 ft)²
= 0.063
Δs = 2.8'
Pw-3D Pump Test
Cw-7D data
Jun 6-23-02
1
10
100
1000

Figure 7-23.

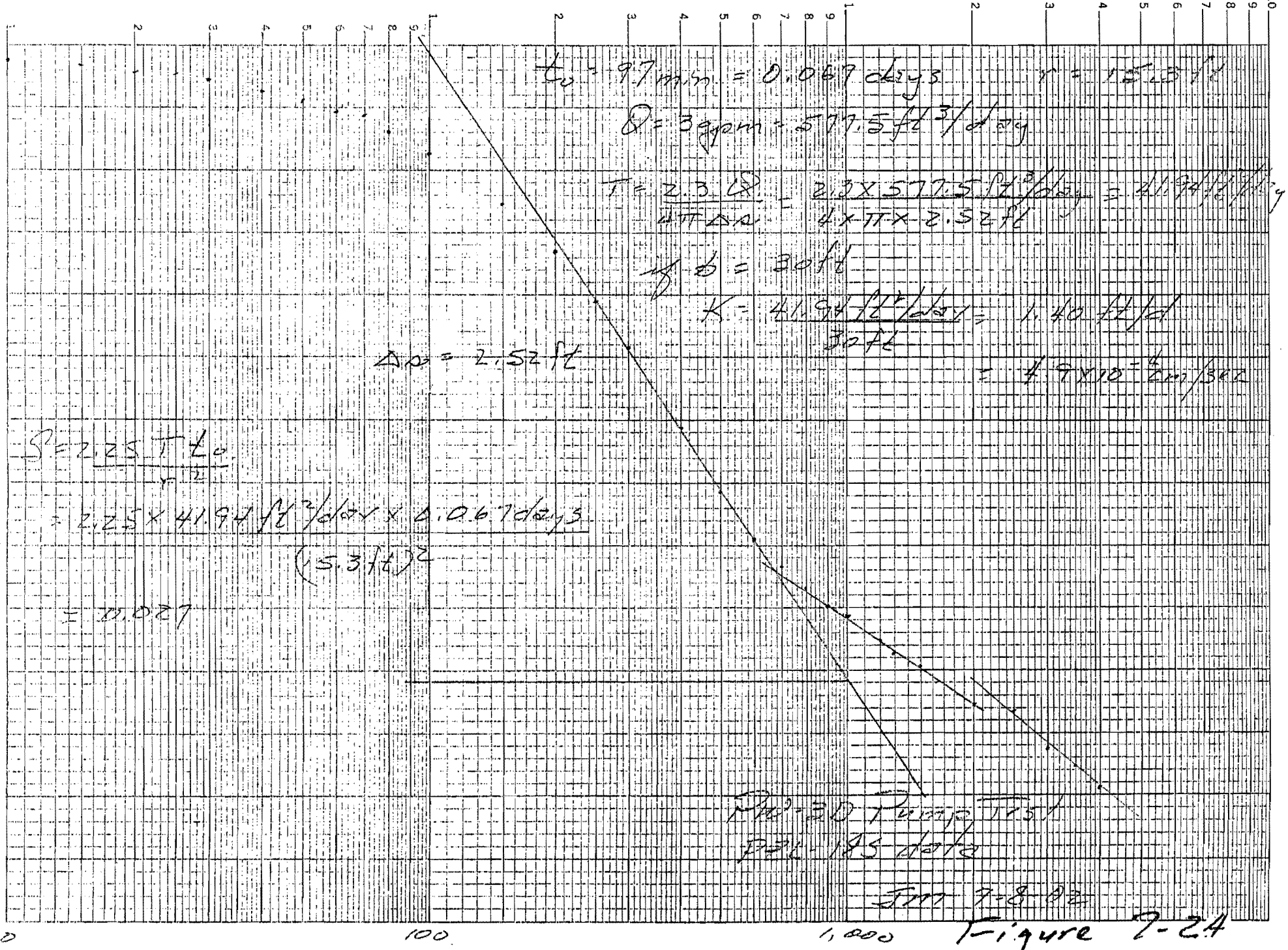
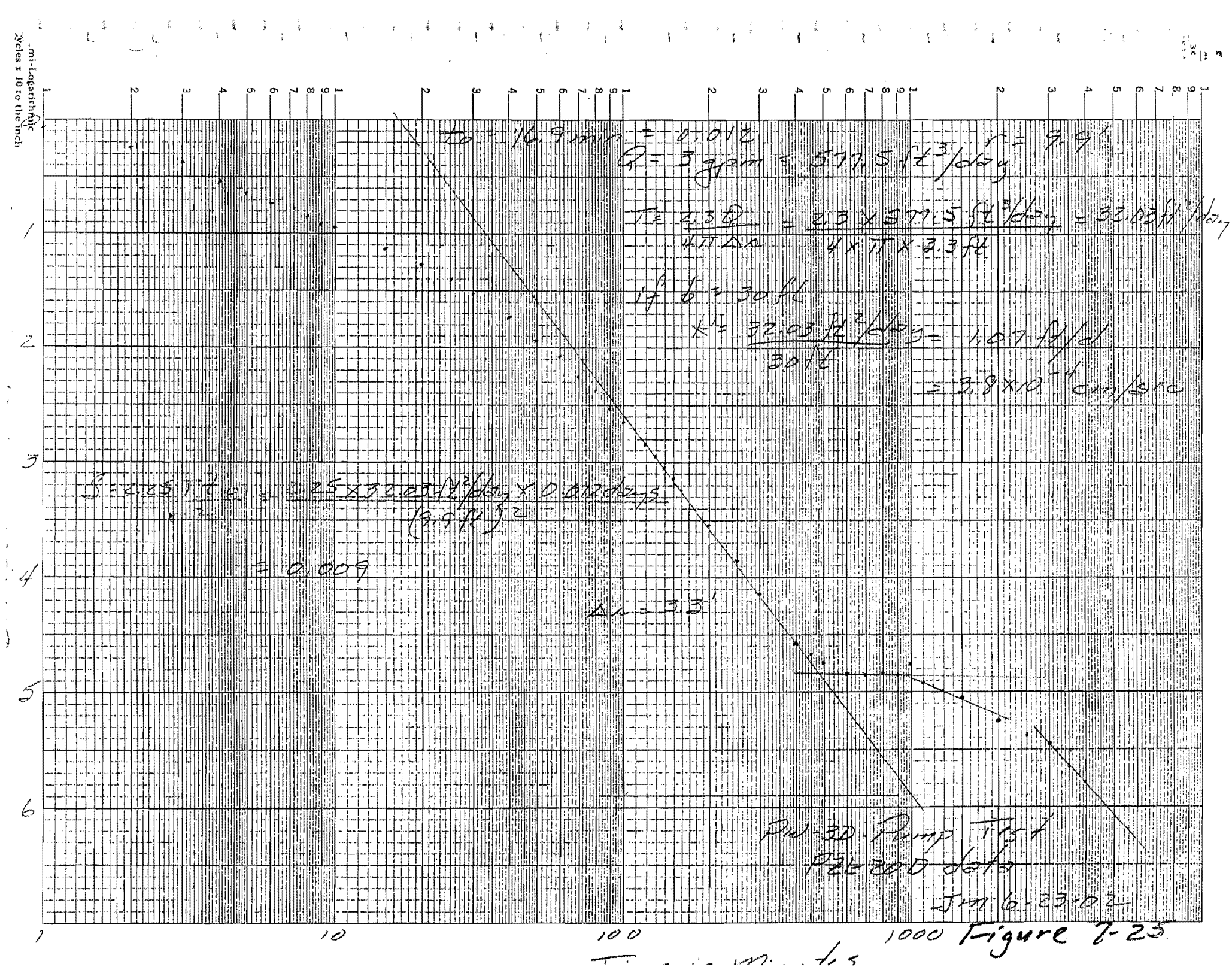
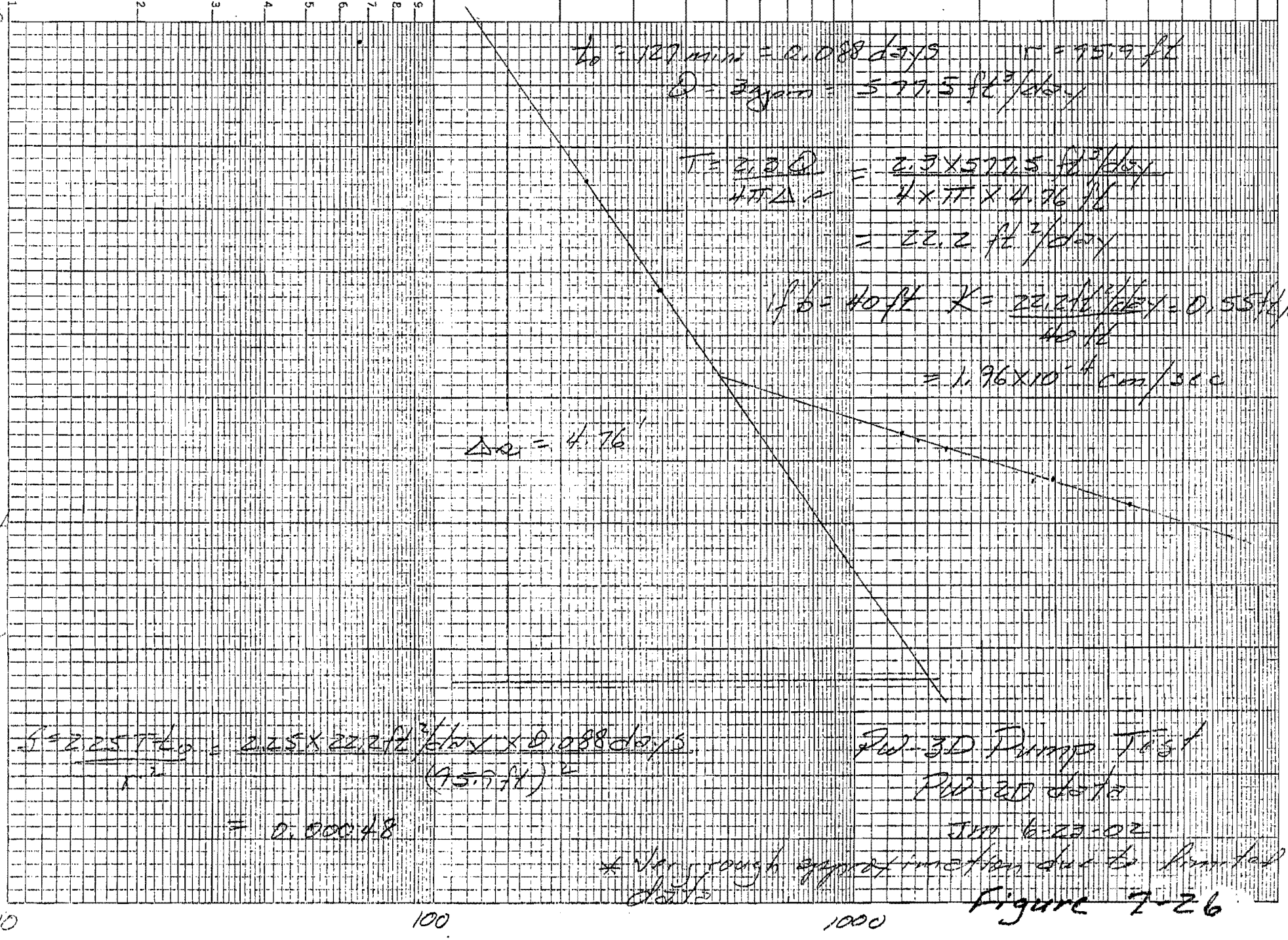

t_0 = 97 min = 0.067 days
r = 15.3 ft
Q = 3 gpm = 577.5 ft³/day
$T = \frac{2.3Q}{4\pi\Delta s} = \frac{2.3 \times 577.5\ ft^3/day}{4 \times \pi \times 2.52\ ft} = 41.94\ ft^2/day$
b = 30 ft
$K = \frac{41.94\ ft^2/day}{30\ ft} = 1.40\ ft/d$
= 4.9 x 10⁻⁴ cm/sec
Δs = 2.52 ft
$S = \frac{2.25\ T t_0}{r^2}$
$= \frac{2.25 \times 41.94\ ft^2/day \times 0.067\ days}{(15.3\ ft)^2}$
= 0.027
Pump Test
Data
Jan 7-8-92
10
100
1,000

Figure 2-24


mi-Logarithmic
cles x 10 to the inch
t_0 = 16.9 min = 0.012
Q = 3 gpm = 577.5 ft³/day
T = 2.3Q / 4πΔs = 2.3 × 577.5 ft³/day / 4 × π × 3.3 ft = 32.03 ft²/day
if b = 30 ft
K = 32.03 ft²/day / 30 ft = 1.07 ft/d
= 3.8 × 10⁻⁴ cm/sec
S = 2.25 Tt₀ / r² = 2.25 × 32.03 ft²/day × 0.012 days / (9.8 ft)²
= 0.009
Δs = 3.3'
PW-3D Pump Test
PZ-200 data
Jan 6-23-02
1
10
100
1000
Figure 7-23


t_0 = 127 min = 0.088 days
r = 75.9 ft
Q = 3gpm = 577.5 ft³/day
$T = \frac{2.3Q}{4\pi\Delta s}$ = $\frac{2.3 \times 577.5 \text{ ft}^3/\text{day}}{4 \times \pi \times 4.76 \text{ ft}}$
= 22.2 ft²/day
if b = 40 ft K = $\frac{22.2 \text{ ft}^2/\text{day}}{40 \text{ ft}}$ = 0.55 ft/day
= 1.96×10⁻⁴ cm/sec
Δs = 4.76'
$S = \frac{2.25 T t_0}{r^2} = \frac{2.25 \times 22.2 \text{ ft}^2/\text{day} \times 0.088 \text{ days}}{(75.9 \text{ ft})^2}$
= 0.00048
Pw-3D Pump Test
Pw-2D data
Jun 6-23-02
* Very rough approximation due to limited data
Figure 7-26
10
100
1000

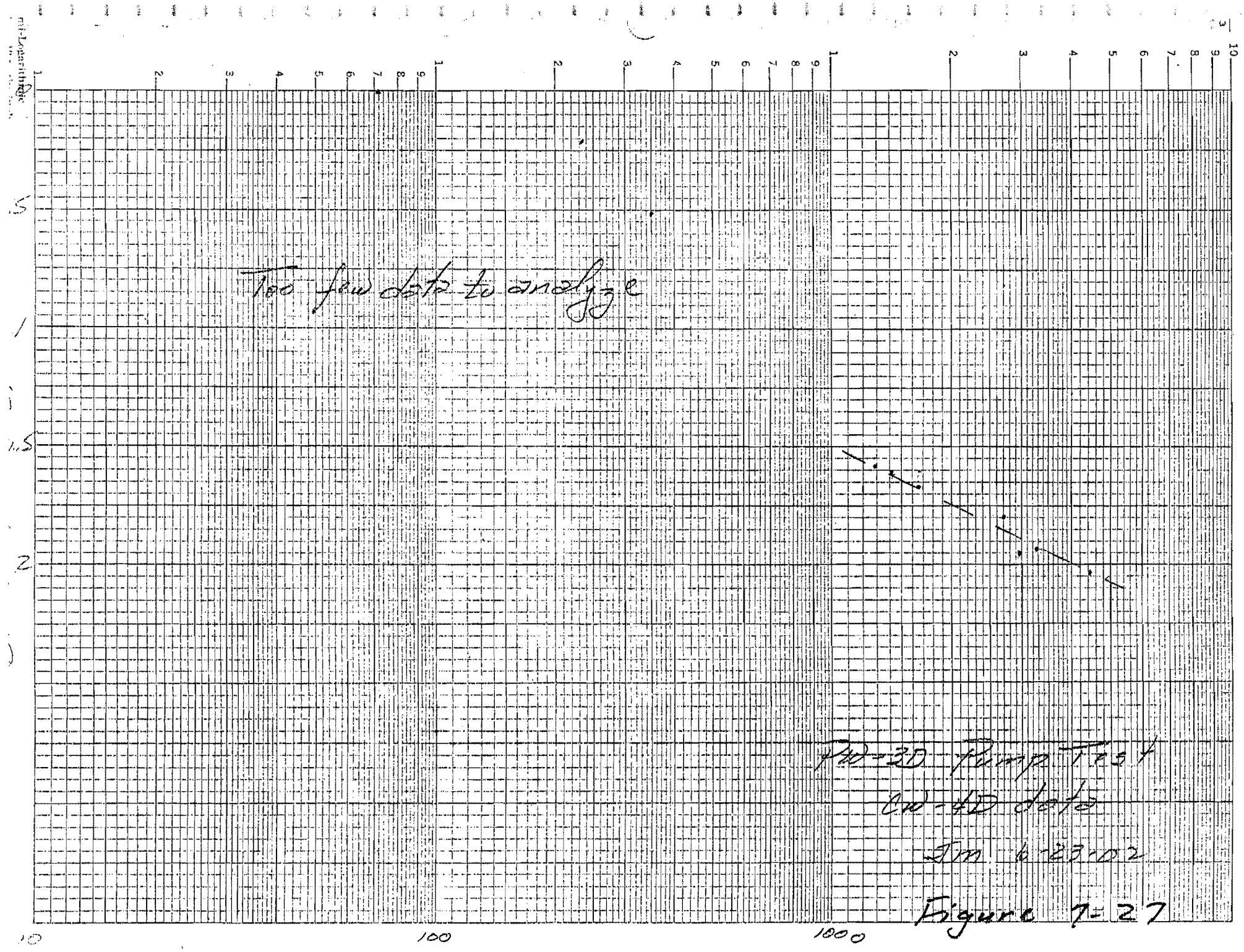

Too few data to analyze
PW-20 Pump Test
Cw-4D data
Jan 6-23-02
10
100
1000

Figure 7-27

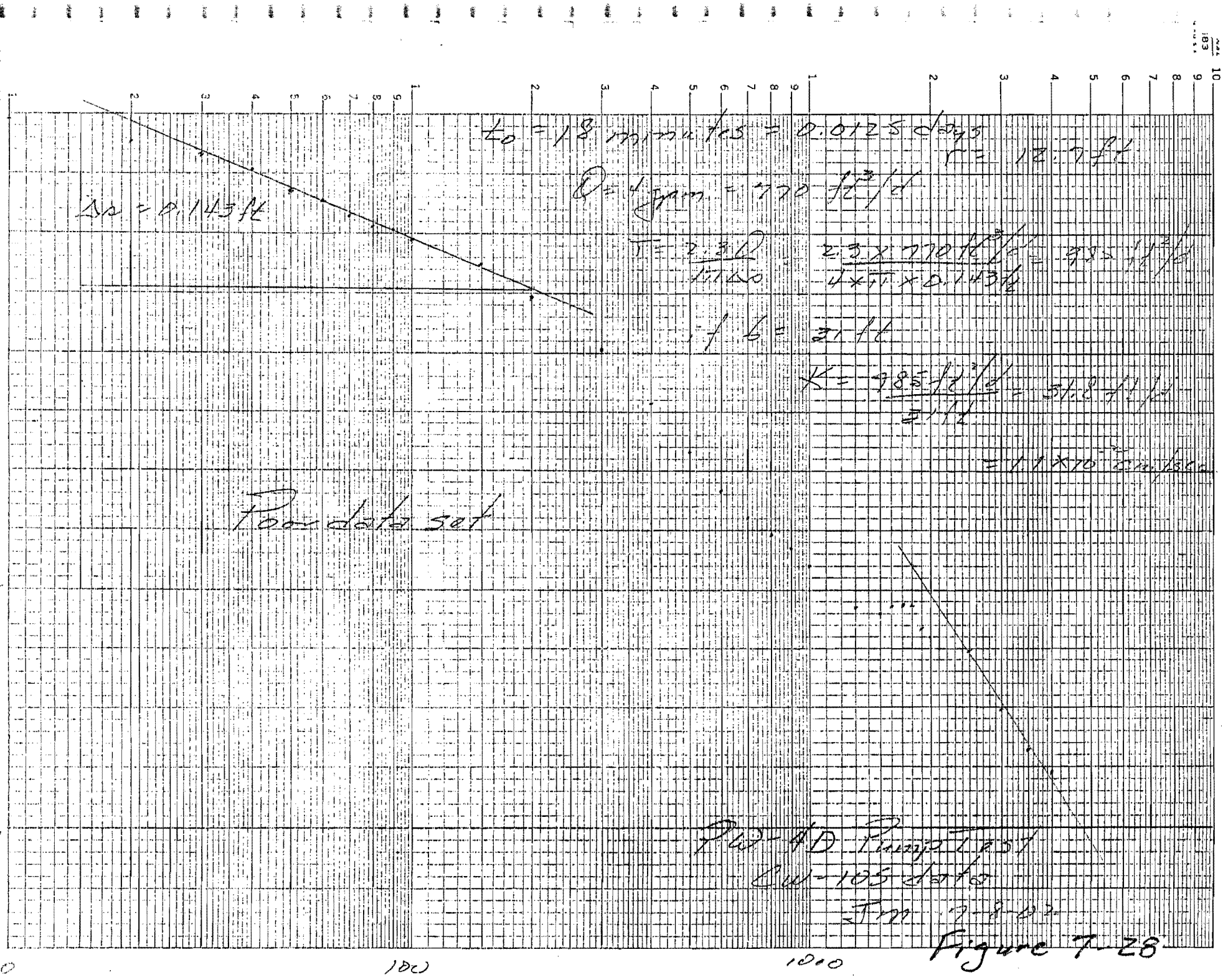
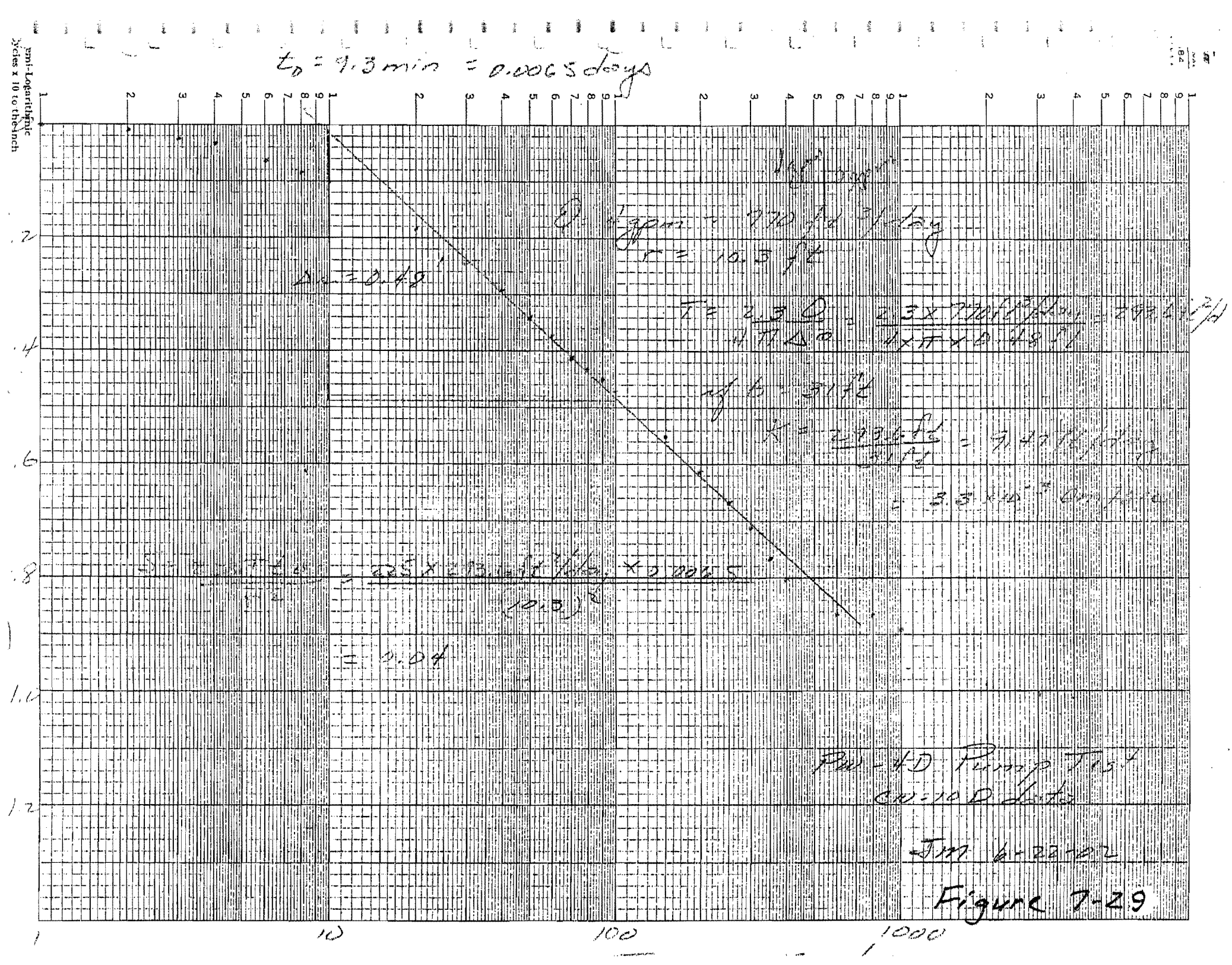

t_0 = 18 minutes = 0.0125 days
r = 12.7 ft
Q = 1 gpm = 770 ft³/d
Δs = 0.145 ft
T = 2.3Q / 4πΔs
2.3 × 770 ft³/d / 4 × π × 0.145 ft = 938 ft²/d
b = 21 ft
K = 938 ft²/d / 21 ft = 44.8 ft/d
= 1.1 × 10⁻² cm/sec
Poor data set
Pan-AD Transient
Cu-105 data
Tyo 7-8-02
10
100
1000

Figure 7-28


t_D = 9.3 min = 0.0065 days
Q = 220 ft³/day
r = 10.5 ft
Δs = 0.42'
T = 2.3 Q / 4πΔs = 2.3 × 220 ft³/day / 4 × π × 0.42 ft = 299 ft²/d
kf b = 31 ft²
k = 299 ft²/d / 31 ft = 9.4 ft/day
= 3.5 × 10⁻³ cm/sec
S = 2.25 T t / r² = 2.25 × 299 ft²/d × 0.0065 / (10.5)²
= 0.04
Pw-4D Pump Test
Cw-10 D Data
Jm 6-22-82
Figure 7-29
Semi-Logarithmic
Cycles x 10 to the inch
1
10
100
1000

$t_o = 105\ min = 0.073\ days$ $\quad r = 7.1\ ft$

$Q = 4\ gpm = 770\ ft^3/day$

$T = \frac{2.3Q}{4\pi\Delta s} = \frac{2.3 \times 770\ ft^3/day}{4 \times \pi \times 1.51\ ft} = 293\ ft^2/day$

$\Delta s = 1.51\ ft$ $\quad b = 26\ ft$

$K = \frac{293\ ft^2/day}{26\ ft} = 11.29\ ft/day$

$= 4 \times 10^{-3}\ cm/sec$

$S = \frac{2.25\,T t_o}{r^2} = \frac{2.25 \times 293\ ft^2/day \times 0.073\ days}{(7.1)^2}$

$= 0.95$

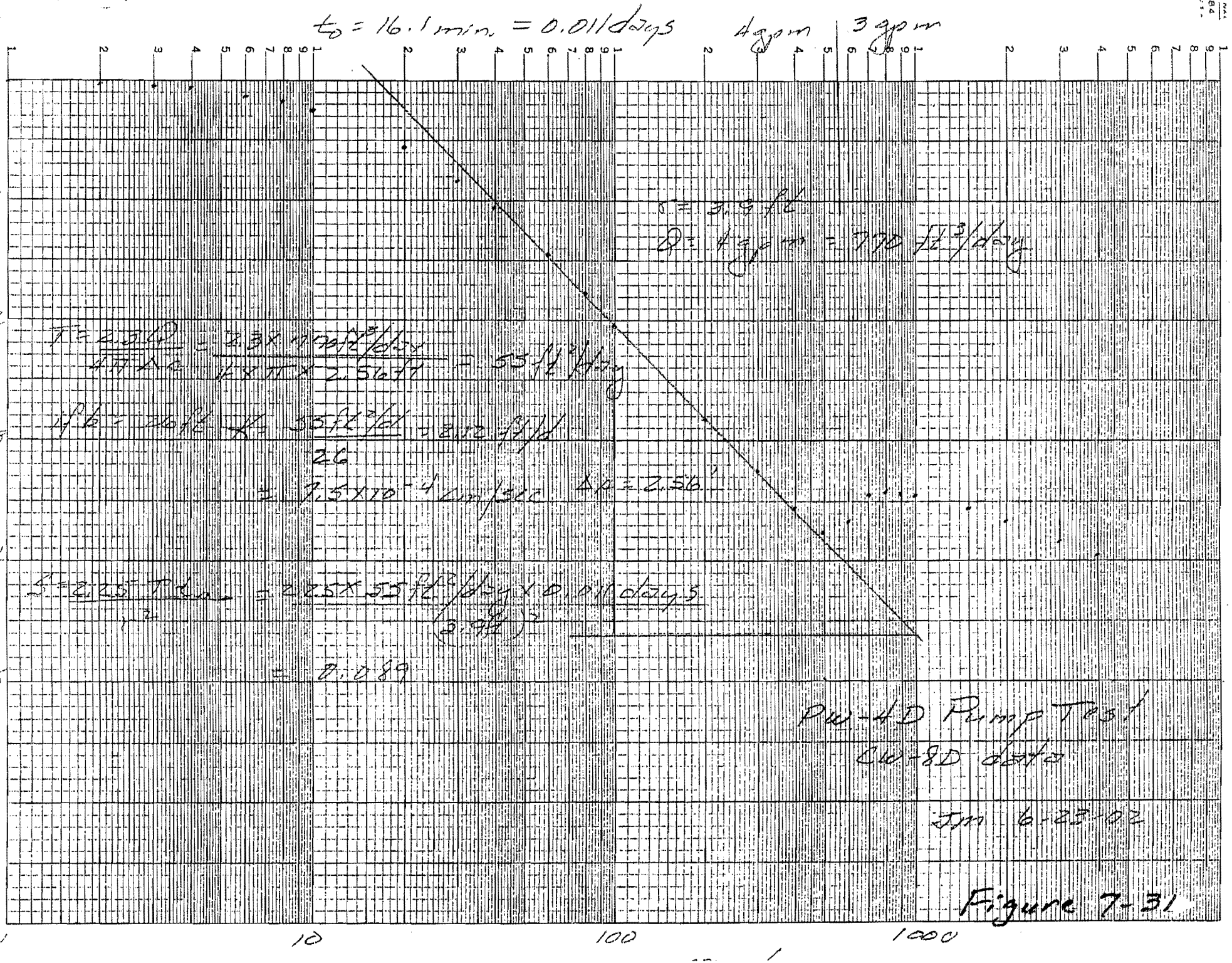
Pw-40 Temp Test

Cw = 8.5 days

Jm 7-8-02

Figure 7-30

10 100 1,000


t_0 = 16.1 min. = 0.011 days
4 gpm
3 gpm
s = 3.9 ft
Q = 4 gpm = 770 ft³/day
T = 2.30Q / 4πΔs = 2.3 × 770 ft³/day / 4π × 2.56 ft = 55 ft²/day
Δh = 26 ft × 55 ft²/d / 26 = 8.12 ft/d
= 7.5 × 10⁻⁴ cm/sec
Δs = 2.25 T t₀ / r² = 2.25 × 55 ft²/day × 0.011 days / (3.9 ft)²
= 0.089
PW-4D Pump Test
OW-8D data
Jan 6-25-02
Figure 7-31
10
100
1000

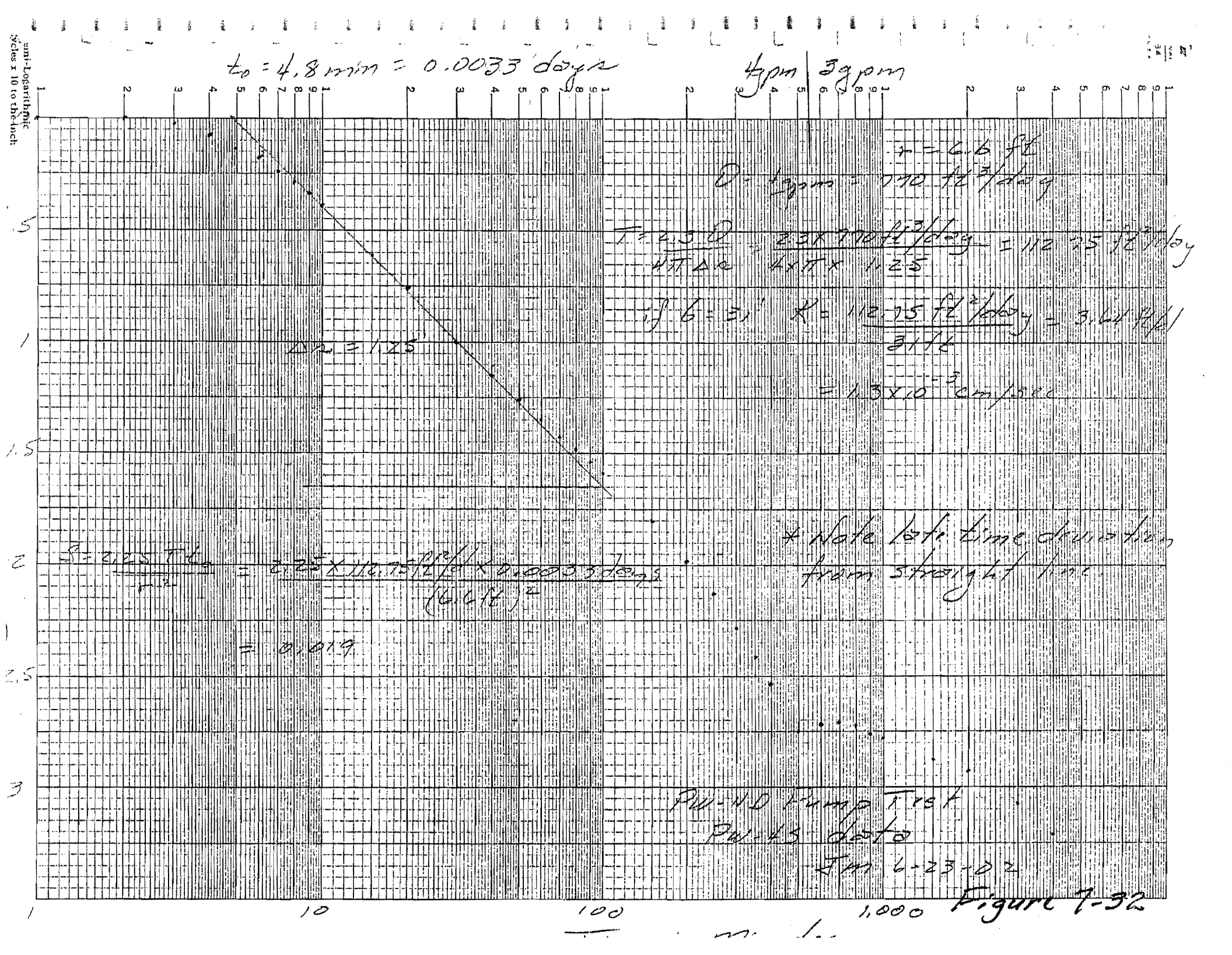

Semi-Logarithmic
Cycles x 10 to the inch
$t_0 = 4.8$ min $= 0.0033$ days
4gpm | 3gpm
$r = 6.6$ ft
Q: 4gpm = 770 ft³/day
$T = \frac{2.3Q}{4\pi\Delta s} = \frac{2.3 \times 770 \text{ ft}^3/\text{day}}{4 \times \pi \times 1.25} = 112.75$ ft²/day
If $b = 31'$ $K = \frac{112.75 \text{ ft}^2/\text{day}}{31 \text{ ft}} = 3.64$ ft/d
$= 1.3 \times 10^{-3}$ cm/sec
$\Delta s = 1.25$
$S = \frac{2.25 T t_0}{r^2} = \frac{2.25 \times 112.75 \text{ ft}^2/\text{d} \times 0.0033 \text{ days}}{(6.6 \text{ ft})^2}$
$= 0.019$
* Note left time drawdown from straight line
PW-4D Pump Test
PW-4S data
TM 6-23-02
1
10
100
1,000

Figure 7-32

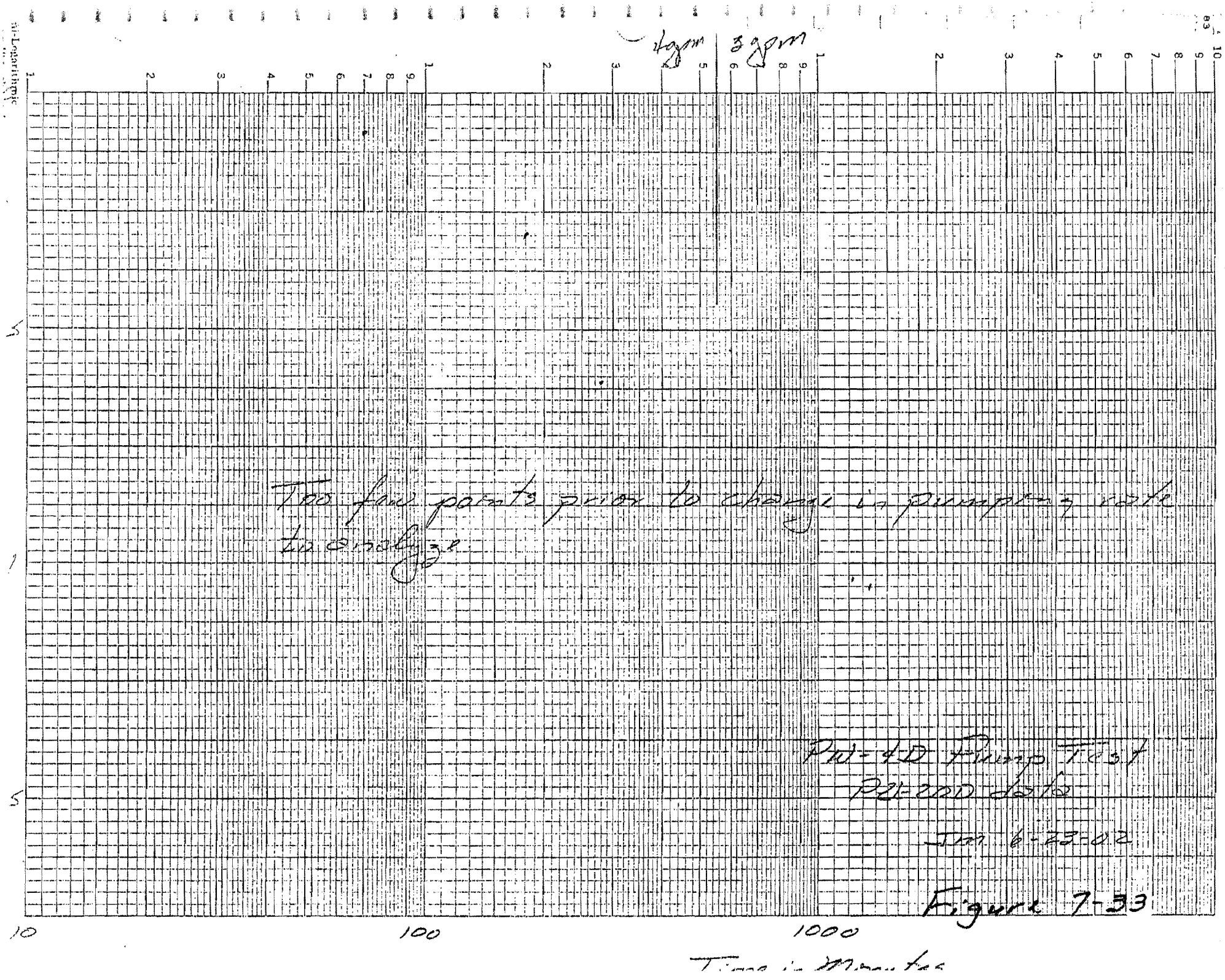

4gpm
3gpm
Too few points prior to change in pumping rate to analyze.
PW-4D Pump Test
PZ-2D data
Jan 6-23-02
10
100
1000
Time in Minutes

Figure 7-33

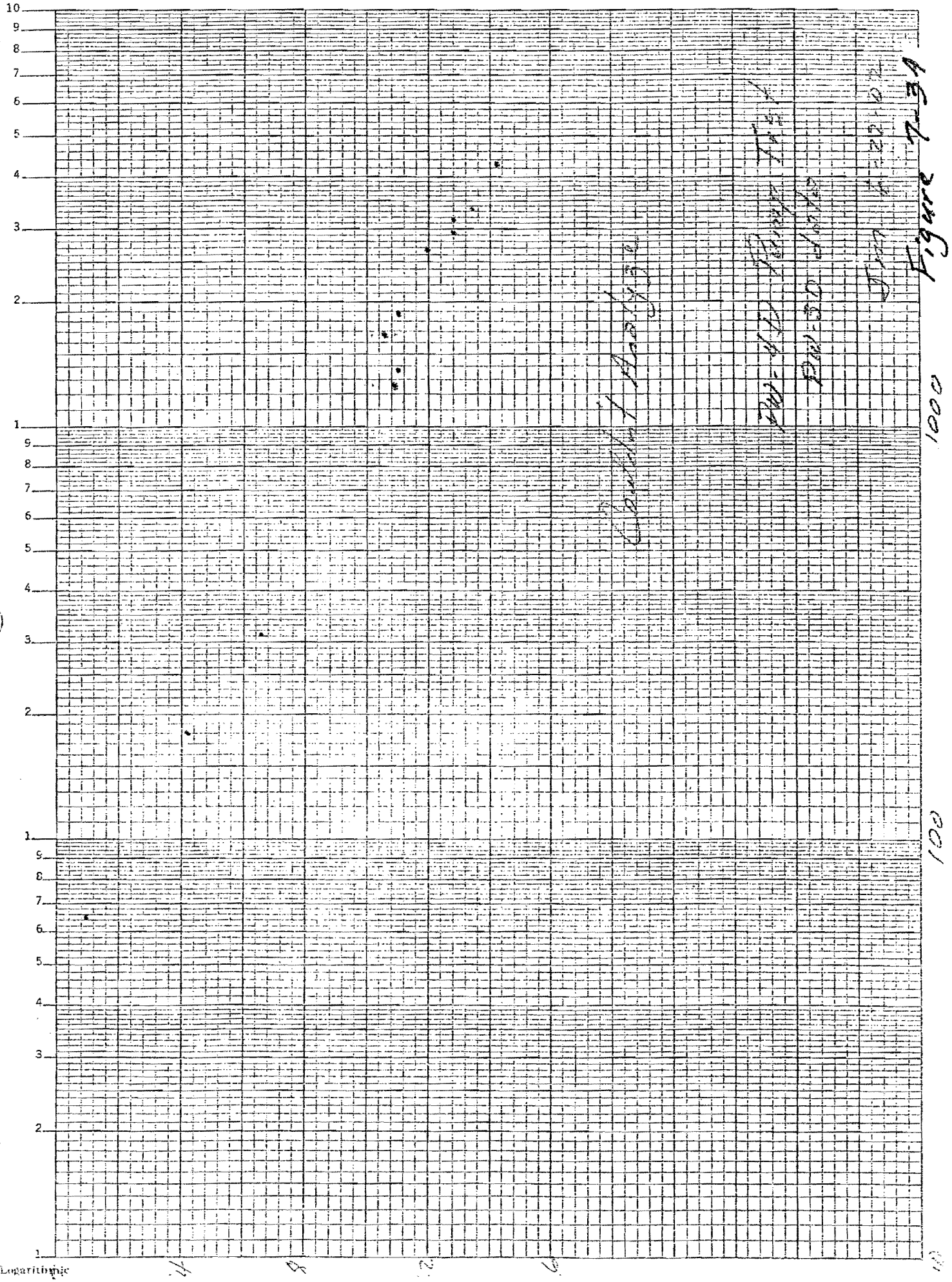


Figure 7-3A
Cumulative Passing
Fw: Hydrometer
Fw: Sieves
Dm: 1.22 D
10000
1000
100
10
1
.1
.01
.001
.0001
10
9
8
7
6
5
4
3
2
1
ni-Logarithmic

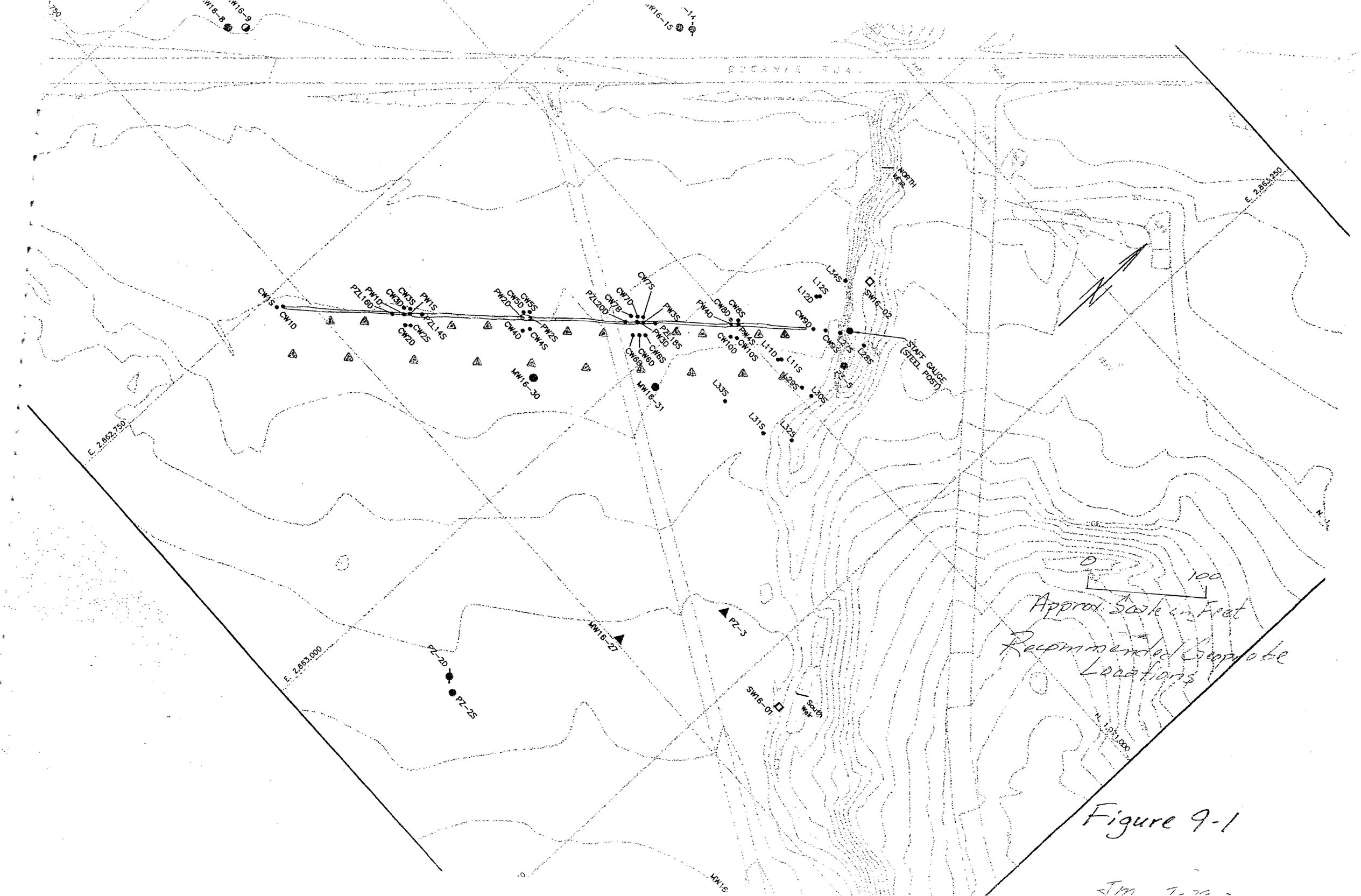

MW16-8
MW16-9
MW16-15
NORTH WEIR
SW16-02
STAFF GAUGE (STEEL POST)
CW1S
CW1D
PZL16D
PW1D
CW3De
CW3S
PW1S
PZL14S
CW2S
CW2D
PW2D
CW5D
CW5S
CW4D
CW4S
PW2S
PZL20D
CW7D
CW7S
CW7B
PW3S
PW3D
PZL18S
CW6D
CW6S
CW6B
MW16-30
MW16-31
PW4D
CW8D
CW8S
PW4S
CW10D
CW10S
L34S
L12S
L12D
CW9D
CW9S
L11D
L11S
L29S
L30S
L28S
L33S
L31S
L32S
E. 2,862,750
E. 2,863,250
E. 2,863,000
N. 1,051,000
MW16-27
PZ-3
PZ-2D
PZ-2S
SW16-01
South Weir
0
100
Approx. Scale in Feet
Recommended Piezometer Locations

Figure 9-1

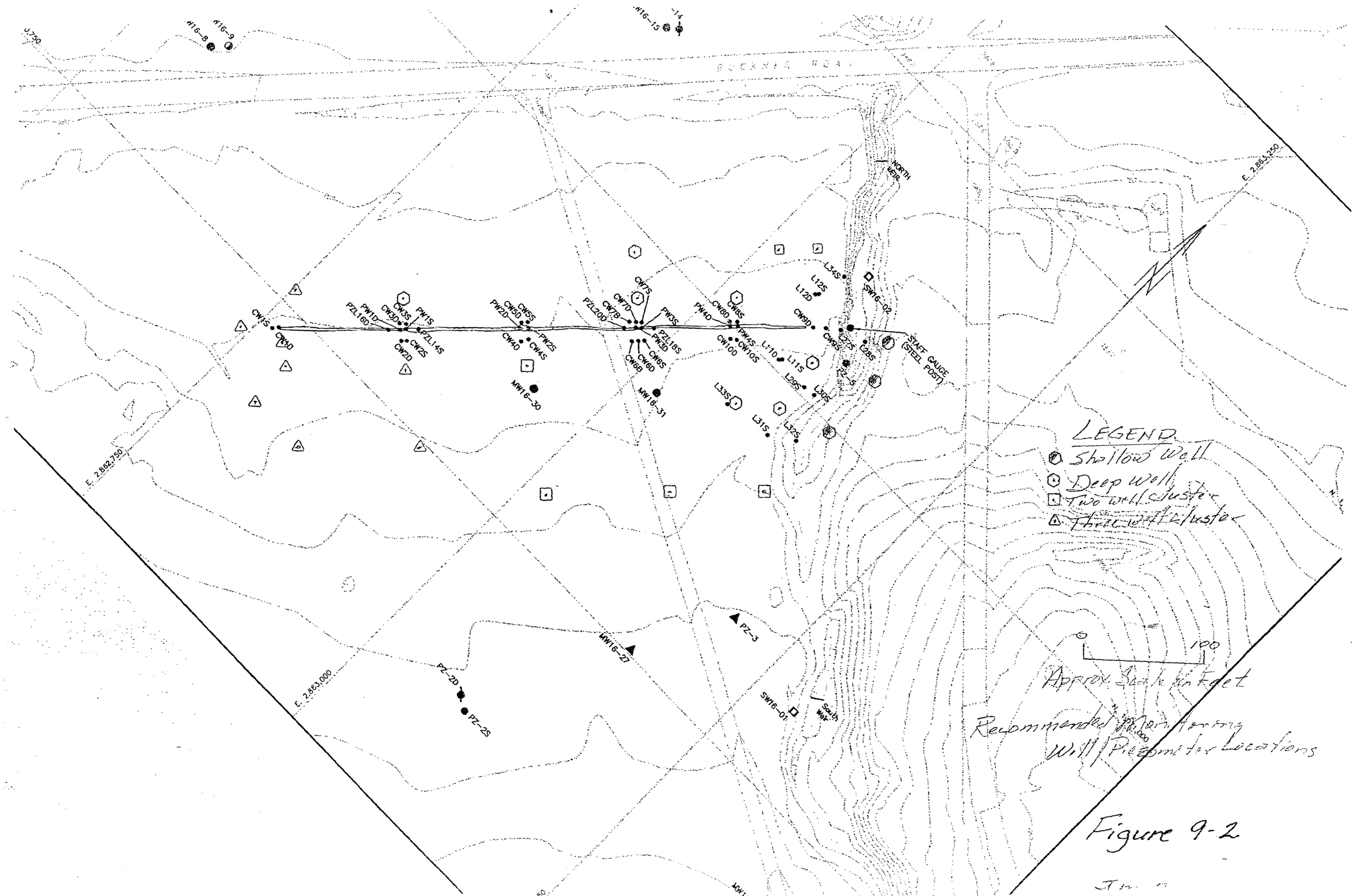
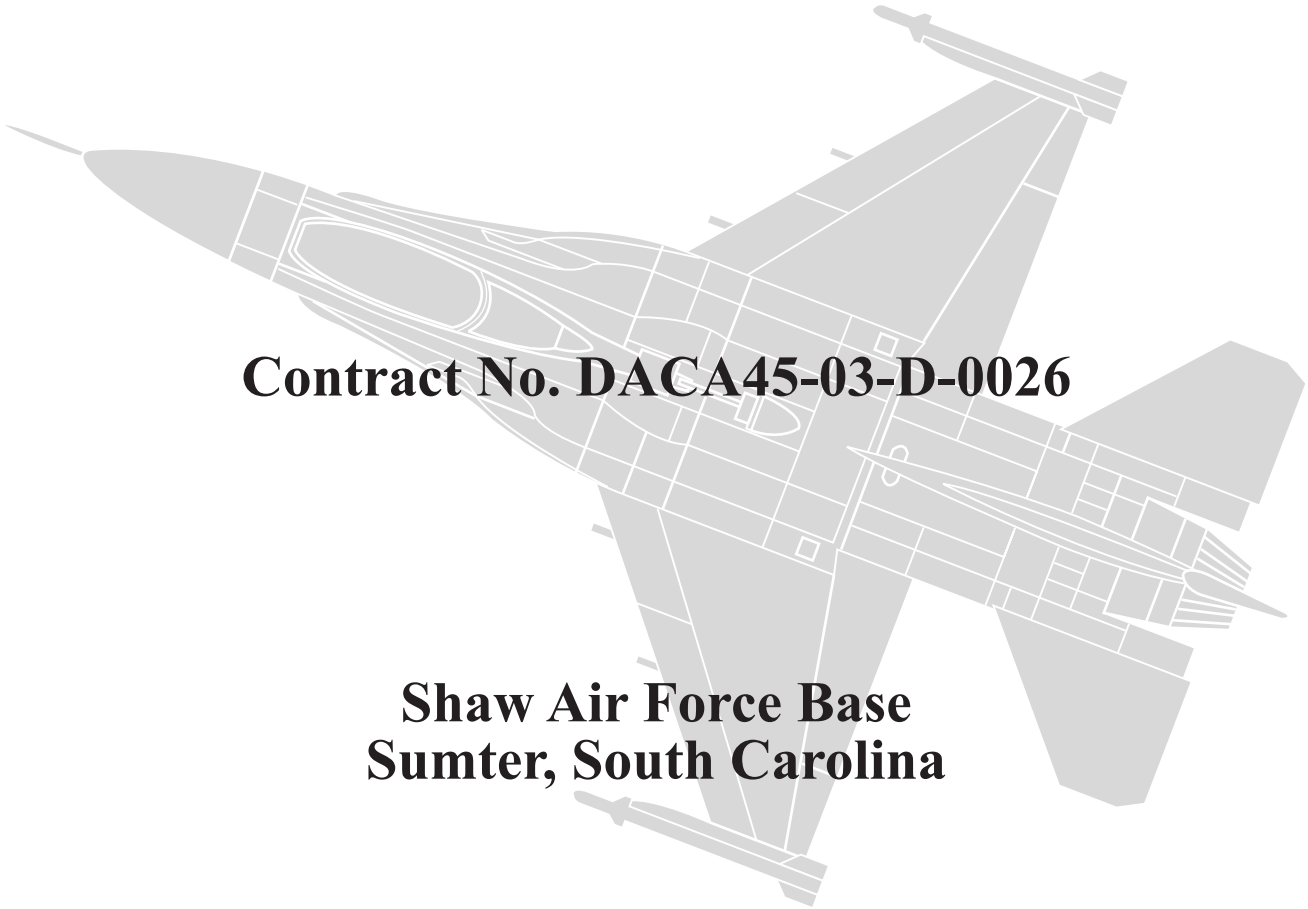

LEGEND
Shallow Well
Deep Well
Two well cluster
Three well cluster
Approx. Scale in Feet
100
Recommended Monitoring Well/Piezometer Locations
NORTH WEIR
SOUTH WEIR
STAFF GAUGE (STEEL POST)
SW16-01
SW16-02
MW16-27
MW16-30
MW16-31
PZ-2D
PZ-2S
PZ-3
E. 2,862,750
E. 2,863,000
E. 2,863,250
CW1S
CW1D
PW1D
PZL16D
CW3D
CW3S
PW1S
PZL14S
CW2S
CW2D
CW5D
CW5S
PW2D
PW2S
CW4D
CW4S
CW7S
CW7D
PZL20D
PW3S
PZL18S
PW3D
CW6B
CW6D
CW6S
CW8D
CW8S
PW4D
PW4S
CW10D
CW10S
L10
L11S
L29S
L30S
L33S
L31S
L32S
L34S
L12S
L12D
CW9D
CW9S
L28S

Figure 9-2

2005 Annual
Remedial Action Operation Report
Operable Unit 4 (SWMU 59)



Contract No. DACA45-03-D-0026

Shaw Air Force Base
Sumter, South Carolina

October 3, 2005

2005 Annual
Remedial Action Operation Report
Operable Unit 4 (SWMU 59)

Shaw Air Force Base
Sumter, South Carolina

For

Prime Contract No. DACA45-03-D-0026

Prepared For:

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Omaha District
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2005 Annual
Remedial Action Operation Report
Operable Unit 4/SWMU 59

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List of Acronyms

AFB	Air Force Base
BTEX	benzene, toluene, ethyl benzene, and xylene
CA	chloroethane
EC	degrees Celsius
CM	corrective measure
CMS	corrective measures study
DCA	dichloroethane
DCE	dichloroethene
DO	dissolved oxygen
DTW	depth to groundwater
EPA	U.S. Environmental Protection Agency
Fe(II)	ferrous iron
IT	IT Corporation
LNAPL	light non-aqueous phase liquid
LTM	long-term monitoring
µg/L	micrograms per liter
MCL	maximum contaminant level
mg/L	milligrams per liter
MK	Mann-Kendall statistical test
MNA	monitored natural attenuation
msl	mean sea level
OU	Operable Unit
PCE	tetrachloroethene
PRB	permeable reactive barrier
QA/QC	quality assurance/quality control
QAPP	quality assurance program plan
QCSR	quality control summary report
redox	oxidation-reduction potential
SCDHEC	South Carolina Department of Health and Environmental Control
SWMU	Solid Waste Management Unit
TCA	trichloroethane
TCE	trichloroethene

List of Acronyms *(Continued)*

TOC	top of casing
VC	vinyl chloride
VOC	volatile organic compound
YSI	Yellow Springs Instrument Company

1.0 Introduction

Shaw Environmental, Inc., through the FPRI DACA45-03-D-0026, is performing final remedial action operation activities and long-term monitoring (LTM) according to the approved corrective measures study (CMS) for Operable Unit (OU)-4 at Shaw Air Force Base (AFB), Sumter, South Carolina (IT Corporation [IT], 2001a). The remedial action operation consists of maintenance of the area near the remedial system and LTM of groundwater; there is no manual operation of this system. The site was identified under Air Combat Command's Environmental Restoration Program as Fire Training Area No. 1, based on the discovery of environmental impact and past practices at the site. The site also is identified according to the Resource Conservation and Recovery Act in the Shaw AFB Hazardous Waste Permit (Permit No. SC7 570 024 466), Appendix A-6, and is also identified by South Carolina Department of Health and Environmental Control (SCDHEC) as Solid Waste Management Unit (SWMU) 59.

The final corrective measure (CM) selected at OU-4/SWMU 59 is a permeable reactive barrier (PRB) for in situ treatment of chlorinated hydrocarbons and monitored natural attenuation (MNA) (IT, 2001a). The LTM program consists of annual compliance monitoring of the CM.

Shaw AFB is an active U.S. Department of Defense installation located in northwest Sumter County, South Carolina. The OU-4 area is in the northeast portion of Shaw AFB and is a former fire training area (Figure 1-1 and 1-2).

The PRB was installed in November 1998. The final remedial goals of the CM are to reduce concentrations of four primary compounds in groundwater as follows:

- 1,1,1-Trichloroethane (TCA) to below 200 micrograms per liter (µg/L)(maximum contaminant level [MCL])
- 1,1-Dichloroethane (DCA) to below 1,080 µg/L (remedial goal option)
- 1,1-Dichloroethene (DCE) to below 7 µg/L (MCL)
- Vinyl chloride (VC) to below 2 µg/L (MCL).

Additionally, the CMS identified final remedial goals for:

- cis-DCE 70 µg/L (MCL)
- Benzene 5 µg/L (MCL)
- Toluene 1,000 µg/L (MCL)
- Trichloroethene (TCE) 5 µg/L (MCL).

The CM design was developed to address four primary targeted compounds as well as to track attenuation of cis-DCE, benzene, toluene, and TCE, and was based on the known concentrations and site conditions (IT, 1998). This report contains the analytical results for monitoring conducted during the second quarter of 2005 (annual event).

1.1 Report Objectives

The objectives of quarterly monitoring at OU-4/SWMU 59 are to:

- Track changes in the concentrations of contaminants in groundwater within the most contaminated portion of the aquifer

- Verify PRB and MNA effectiveness to meet final CM remedial goals.

The 2005 annual LTM sampling program consisted of the following tasks.

- Groundwater samples were collected from 11 site monitoring wells, 19 compliance wells (including the well C-1), 4 performance wells, and 7 C-1 area monitoring wells for a total of 41 monitoring wells.

- Surface water samples were collected from 6 locations along the perimeter of Long Branch Creek.

Figure 1-3 shows the LTM well locations. All groundwater and surface water samples were analyzed for volatile organic compounds (VOC) by U.S. Environmental Protection Agency (EPA) Method 8260B (SW846). A select group of monitoring wells was also analyzed for MNA parameters. The current groundwater monitoring program is summarized in Table 1-1.

All work was conducted in accordance with the Shaw AFB quality assurance program plan (QAPP) (IT, 2002) and the site safety and health plan (IT, 2000).

1.2 Site Description and History

OU-4 is approximately 13 acres in size, partially wooded, and bounded on the east by Long Branch Creek. The only man-made features at OU-4/SWMU 59 are a parking lot, a pavilion,

and the former fire training area. The topography in the immediate vicinity of OU-4/SWMU 59 is relatively flat at the former fire training area, and decreases in slope east toward Long Branch Creek, which flows to the southeast. The ground surface elevation from west to east across the site ranges from 218 to 198 feet above mean sea level (msl).

Former Fire Training Area No. 1 was reportedly used on a weekly basis from 1941 to 1969 to conduct fire training exercises (Law Environmental, Inc., 1991a,b). Combustible wastes used in training exercises included jet fuel, hydraulic fluid, waste oils, spent solvents, contaminated fuels, and napalm. The pit was unlined, and liquid combustible waste infiltrated into the sandy soils underlying the pit. Based on historical aerial photos, it appears that the location of the fire training ring was moved periodically during the operation of the facility (Rust Environment and Infrastructure, 1995). From approximately 1965 until the site was closed in 1969, only jet petroleum grade 4 fuel was used for burning. The extinguishing agents used during these exercises included water, carbon dioxide, protein foam, and aqueous film-forming foam.

1.3 Synopsis of PRB Inception and Past Performance

The PRB was installed in 1998 during drought conditions; however, the design was based on average site conditions present before the drought. QA during and post installation confirms all design and construction criteria were met and that the PRB functions as designed for depth, thickness and residence time which was based on the highest contaminant concentrations and worst case scenarios (IT, 1998). Groundwater flow rates were confirmed in a groundwater flow study that was discussed in the 2002 quarterly report (IT, 2000); flow rates were consistent with the PRB design criteria that were used, and no preferential pathways were identified, and continued monitoring of groundwater levels and groundwater flow direction indicate no change has occurred. It was recognized within the first year of operation of the PRB that daughter products resulting from degradation and breakdown of the TCA and DCA were being produced within the PRB zone and were increasing downgradient of the PRB. However, as steady-state conditions were achieved for breakdown of TCA and DCA within the PRB, the daughter products also showed a decreasing trend downgradient, due in part to the steady-state condition having been achieved within the PRB and due in part to the natural attenuation of the daughter products in the downgradient area of the PRB; this is why the PRB coupled with monitored natural attenuation (MNA) were proposed and approved as the final remedy for the site in the CMS (IT, 2001). It has been consistently shown in all past monitoring reports that MNA continues to degrade daughter products downgradient of the PRB and prevents migration of the contaminants to Long Branch Creek; all contaminants downgradient of the PRB show decreasing concentration trends in spite of remaining above MCL. No contaminants have been detected in

Long Branch Creek above surface water standards since 1993. Integrity of the PRB is expected to remain intact for an undetermined length of time because of the anaerobic properties in soils and groundwater that exist at the site; low pH, low dissolved oxygen levels, and negative redox potentials are not conducive to the formation of precipitators on the PRB; the low dissolved oxygen levels also dictate the reactive medial (zero-valent iron in this case) will be consumed very slowly ("Design Guidance for Application of Permeable Barriers to Remediate Dissolved Chlorinated Solvents," Battelle, 1997). Chemistry of the groundwater within the PRB zone was monitored quarterly for 5 years (IT, 1999, 2001, 2002, and 2003 and Shaw, 2004). Some time after steady-state conditions were achieved and there was no indication that the groundwater chemistry and reactivity of contaminants within the PRB changed over time. Additionally, comparison and review of influent concentrations from the upgradient source area wells (C-2, C-4, and C-8) to their downgradient companion wells (C-3, C-5,and C-9) continue to show completed degradation pathways (TCA to DCA to DCE/cis-DCE, and VC) consistent with the PRB history. Results from all past monitoring events to date indicate the PRB and MNA have continued to prevent any risk to surface water in Long Branch Creek.

2.0 Field Methods

Shaw Environmental, Inc. followed procedures outlined in the QAPP (IT, 2002) and the revised LTM work plan (Shaw Environmental, Inc., 2003) to ensure that activities performed during this field event conformed to quality assurance/quality control (QA/QC) goals.

2.1 Groundwater Elevation

Static depth-to-water measurements were made at all sampled OU-4/SWMU 59 groundwater monitoring wells before purging and sampling. Groundwater flow direction is discussed in Section 3.1.

2.2 Groundwater Sample Collection

Groundwater samples from OU-4/SWMU 59 were collected from monitoring wells between April 14 and April 23, 2005. Samples were collected after the groundwater quality parameters stabilized or the requisite purge volume had been met, or after the well was purged/bailed dry and allowed to recharge for sample collection. Well purge logs are provided in Appendix A.

Groundwater samples were submitted to Kemron Environmental Services of Marietta, Ohio, for analysis of VOCs and to the Biotechnology Laboratory of Knoxville, Tennessee for methane, ethane, ethene analysis of selected groundwater samples. Analysis request/chain-of-custody forms are included in Appendix A.

The field test for ferrous iron was performed in the field using a Hach test kit (EPA Method 8146). The test was conducted on both filtered and unfiltered aliquots of each groundwater sample collected from the compliance and performance monitoring wells. The field test forms are included in Appendix A.

2.3 Sample Container and Preservatives

Sample containers for VOCs and MNA parameters and the preservatives used were in accordance with Table 6-2 of the QAPP (Shaw, 2002).

3.0 Groundwater Sampling Summary

Field data including: groundwater elevations, groundwater quality parameters, and groundwater analytical results obtained from the 2005 annual groundwater monitoring event at OU-4, conducted on April 14-20, 2005, are discussed in the following sections.

Groundwater analytical data used to construct the contaminant isoconcentration maps are presented in this section. Surface water samples were collected from Long Branch Creek to quantify any contaminants at the creek boundary downgradient of the PRB and downgradient of the C-1 area. The Mann-Kendall statistical test (MK) was applied to the analytical data from various monitoring wells to evaluate trends in contaminant concentrations.

3.1 Groundwater Elevation and Groundwater Flow Direction

Table 3-1 presents groundwater elevation data for November 2004 and April 2005. Figure 3-1 shows groundwater elevation contour maps from the April 2005 data. These figures show clearly that groundwater flow is to the east, consistent with previous observations. In addition, groundwater is not mounding or flowing over the top of the PRB or around the ends of the PRB. The groundwater profiles across the PRB for April 2005 indicates that groundwater flow has remained predominantly eastward, with a slightly southward trend.

The groundwater flow properties were used to develop the PRB design to ensure sufficient residence time and treatment of contaminated groundwater flowing through the PRB (IT, 1998). The groundwater velocity (1.5 feet/day) is used to determine pore volumes of groundwater that will have passed through the 50-foot-wide PRB treatment zone. At 1.5 feet/day, 32 days are required for one pore volume to pass through the PRB zone. Based on the groundwater flow velocity of 1.5 feet/day, approximately 83 pore volumes have passed through the PRB since January 1999.

Light Nonaqueous-Phase Liquid. Light nonaqueous-phase liquid (LNAPL) has been sporadically present in some of the monitoring wells throughout most of the monitoring history. Since January 2000, LNAPL has periodically been reported in MW-1, MW-120A, MW-122A, C-8A, and C-4A, with variable thickness that ranged from a sheen in three of the wells up to 2.45 feet in MW-120. The LNAPL is highly weathered and is black and viscous but does not have a pronounced odor. Since August 2002, no significant measurable amount of LNAPL was observed in these wells (less than or equal to 0.16), and no measurable amount of LNAPL was

recovered with the passive bailers. The only well that showed LNAPL during the April 2005 sampling event, was MW-120 with an LNAPL thickness of 0.21 feet.

3.2 Groundwater Quality and Field Parameters

Groundwater quality parameters, including temperature, pH, conductivity, turbidity, DO, and redox were measured during monitoring well purging before sample collection to ensure that a representative groundwater sample was being collected and to obtain groundwater chemistry data. Table 3-2 is a summary of the final field-measured water quality parameters for all wells sampled in April 2005. Groundwater quality parameters and changes in microbial degradation are discussed more fully in Chapter 4.0, "Monitored Natural Attenuation".

3.3 Data Quality Evaluation

The quality control summary report (QCSR) is included in Appendix B. The overall data quality for field samples collected and analyzed during this sampling event was acceptable, with the exceptions noted in the QCSR. All data are deemed usable for their intended purposes.

3.4 Groundwater Analytical Results

Seven of the groundwater samples were collected from existing site monitoring wells located upgradient of the PRB. Nineteen groundwater samples were collected from compliance and performance monitoring wells associated with the PRB zone (immediately upgradient or downgradient of the PRB treatment zone). Seven groundwater samples were collected from the C-1 area wells (C-15 through C-21) located south of the PRB zone. The four contaminants targeted for destruction by the PRB (1,1,1-TCA, 1,1-DCA, 1,1-DCE, and VC) were identified in the approved CMS (IT, 2002). The CMS also identified benzene, toluene, cis-DCE, and TCE as contaminants targeted for degradation by MNA and also are continually tracked and reported. Discussions of analytical results within this report include these and other compounds that exceed MCLs. All laboratory analytical reports for the 2005 annual event are included in Appendix B. A summary of the April 2005 sampling results is presented in Table 3-4.

3.4.1 Mann-Kendall Statistical Analysis

Analytical data from January 1999 to April 2005 were used to evaluate concentration trends in 29 wells using the Mann-Kendall (MK) Statistical Analysis. MK concentration trends were developed for compounds TCA, DCA, DCE, VC, cis-DCE, and benzene. MK trends were not evaluated for toluene or TCE because these compounds only have been detected above MCLs intermittently at a few monitoring wells at the site. The MK results are summarized in

Table 3-5. The data tables and accompanying graphs used for the MK process are included in Appendix C. Results of the MK evaluation are as follows:

- The MK evaluation for site monitoring wells indicates there are no concentration trends, or there are decreasing concentration trends for all 6 compounds evaluated (Table 3-5).

- The MK evaluation for upgradient monitoring wells indicate there are no concentration trends or decreasing concentration trends for all 6 compounds with the exception of C-2A; C-2A has shown a statistically increasing trend since 2001 (Table 3-5).

- The MK evaluation for downgradient PRB wells indicate there are mostly decreasing concentration trends and some wells with no concentration trends for all 6 compounds with the exception of C-3A; C-3A has shown a statistically increasing trend in 2002 and 2005.

- The MK evaluation for the sidegradient well C-10 indicate no concentration trends or decreasing concentration trends for 5 compounds; benzene has shown a statically increasing trend since 2003.

- The MK evaluation for sidegradient well C-1 indicates increasing concentration trends for 5 compounds; benzene concentrations showed a statistically decreasing trend.

- The MK evaluation for C-1 area wells indicate there are mostly no concentration trends or decreasing trends for 6 compounds with the exception of an increasing concentration trend for benzene in C-16, and an increasing concentration trend for VC in C-17.

3.4.2 Changes in Plume Configuration (Site Monitoring Wells)

Final remedial goals were established for eight compounds: 1,1,1-TCA, 1,1-DCA, 1,1-DCE, VC, TCE, cis-DCE, benzene, and toluene (IT, 2001b). The concentrations of these target compounds found in samples collected between January 1999 and April 2005 are listed in Table 3-6. The plume configuration for each of the eight target analytes is shown in Figures 4-1 to 4-7. Typically, monitoring wells MW-1, MW-115, MW-117, and MW-120 have consistently contained the highest VOC concentrations. VOC concentration trends indicate TCA, DCE, VC, and benzene have decreased since October 2003. Concentrations of DCA appear to have leveled off, but are expected to increase with further biodegradation of TCA. Compared to the last annual event in April 2004 the plume area for all target analytes detected has decreased.

3.4.3 PRB Performance and Compliance

Table 3-7 presents a data summary for PRB targeted compounds (1,1,1-TCA, 1,1-DCA, 1,1-DCE, and VC) and compounds with established remedial goals (TCE, cis-DCE, benzene, and toluene) from January 1999 to April 2005. Discussion of the April 2005 analytical results in this report focuses on the downgradient compliance wells as a measure of PRB and MNA effectiveness in meeting final remedial action levels.

For PRB wells C-3A,B,C, C-5A,B,C, and C-9A,B,C located immediately downgradient of the PRB, detected concentrations of TCA, DCA, and TCE remain below the MCL or remedial goal. Detected concentrations of DCE are above the MCL in C-3A,B and detected concentrations of VC and benzene remain above the MCL in most downgradient wells. Detected levels of cis-DCE and DCE were above the MCL in wells C-3A,B and C-5B. For the PRB compliance wells located approximately 100 feet downgradient of the PRB (C-11, C-12, C-13, and C-14) detected concentrations of TCA, DCA, TCE, and toluene remain below the MCL or remedial goal. Detected concentrations of DCE and VC exceeded the MCL in C-11 and C-14 and, benzene exceeded the MCL in C-11, C-13, and C-14. However, for the analytes that continue to remain above MCL, concentration levels in all the downgradient wells continue to show decreasing trends. The PRB targeted VOCs (TCA, DCA, DCE) are effectively being destroyed within the PRB treatment zone while the remaining analytes and daughter products produced within the PRB zone or were pre-existing downgradient are being reduced through MNA and biodegradation. The plume configurations for each of eight analytes (Figure 4-1 to Figure 4-7) during this period have remained stable as compared to previous reports. The MNA evaluation discussed in the following Chapter 4.0 verifies continued degradation of analytes detected in groundwater downgradient of the PRB, which eliminates the potential for contaminants to reach surface waters of Long Branch Creek. The vertical extent of VOCs (TCA, DCA, DCE, and VC) within the PRB zone indicate that no VOCs are migrating below the PRB.

3.4.4 C-1 Area

Analytical results for the C-1 area wells are summarized in Table 3-7. Refer to Figures 4-1 to 4-7 for isoconcentration maps. The seven monitoring wells (C-15 to C-21) were installed to monitor the portion of the site plume located south of the PRB; the plume in this area appears to originate from a previously unidentified undocumented hot spot upgradient of well C-1 not present during pre-design investigation. Detected concentrations of TCA,TCE, DCA, and toluene all were below MCL. Detected concentrations of DCE, VC, and cis-DCE, were highest in wells C-15 and C-17 which are located downgradient from C-1. Detected concentrations of DCE and cis-DCE exceeded MCL in C-15 and C-17; detected concentrations of VC and benzene

exceeded MCL in three of the seven C-1 area wells (C-15, C-16, and C-17). The VC concentrations in C-17 showed an increasing trend; however, data for methane and chloroethane also have continued to remain elevated (1500 µg/L methane, and 770 µg/L chloroethane) indicating VC is fully degrading in this area. While some of the C-1 area wells show decreasing VOC concentrations, most show that no trend can be identified from the current data set. The plume extension shown for the C-1 area remains delineated and appears to be stable compared to results from past sampling events.

3.4.5 Plume Metrics

In Figures 4-1 through 4-7 the 2005 plume areas are compared to the 1999 and 2004 plume areas. The 1999 data have typically been the "baseline" data for all previous data comparisons and data evaluations. With the inclusion of the C-1 area wells the plume configurations for target compounds changed; the 2004 data was the first comprehensive data set to include the C-1 wells. Therefore, percent plume reduction is based upon 2005 compared to 2004.

The reduction in contaminant mass and plume area from 2004 to 2005 is summarized as follows:

Compound	Mass Reduction (%)	Area Reduction (%)
TCA	94	80
DCA	71	68
DCE	68	48
VC	73	42
TCE	99	99
cis-DCE	63	34
Benzene	50	41

3.5 Surface Water Results

April 2005 analytical results of the surface water samples, SWS-201 to SWS-206 collected from Long Branch Creek indicated detections of cis-DCE, DCA and chloroethane (CA) in the sample collected at SWS-206. None of the detected compounds exceeded the MCLs of surface water standards. No other surface water samples indicated detections of VOCs. A summary of historical analytical results for the surface water samples is shown in Table 3-8.

MK cannot be done on surface water results because there are not enough detections to evaluate valid statistical trends.

4.0 Monitored Natural Attenuation

The most recent groundwater sampling results collected in April 2005 at the OU-4 site were evaluated to determine current site conditions and the effect of natural attenuation processes, including biodegradation, on contaminant concentrations in groundwater.

4.1 Introduction

The natural attenuation of chlorinated solvents and petroleum hydrocarbons is well-documented and is generally well accepted as an effective remedy for contaminated groundwater. Previous evaluations of the OU-4 site groundwater have concluded that the PRB has reduced 1,1,1-TCA concentrations in the source area and that anaerobic biodegradation under methanogenic conditions has occurred, reducing 1,1,1-TCA, daughter products, and petroleum hydrocarbons at the site (Shaw, 2004).

Two lines of evidence were used to demonstrate the contribution of natural attenuation to groundwater restoration at OU-4. The first line of evidence demonstrates the loss of contaminant mass over time and downgradient from the source area. The second line of evidence involves changes in groundwater chemistry that directly correlate with biological activity. This chapter summarizes the results of the April 2005 VOC and geochemical sampling event, compares them to previous results, and presents a brief interpretation of the data relative to natural attenuation.

4.2 First Line of Evidence: Contaminant Concentrations

Groundwater contaminants at OU-4 include chlorinated ethanes (1,1,1-TCA, 1,1-DCA, CA), chlorinated ethenes (1,1-DCE, cis-1,2-DCE, and VC), and petroleum hydrocarbons (benzene, toluene, ethylbenzene, and total xylenes). VOC concentrations measured during the April 2005 sampling event are provided in Table 3-4. The following conclusions summarize the trends in contaminant concentrations within the PRB Area, the C-1 area, and in Site Monitoring Wells.

- ***Site Monitoring Wells*** – 1,1,1-TCA, 1,1-DCE, cis-1,2-DCE, VC, and benzene concentrations exceeded their established MCLs in four of the eleven wells sampled. The concentrations of parent compounds were on the same order of magnitude as daughter product concentrations. In addition, the contaminant concentrations are lower than observed upgradient of the PRB. Rate constants and half-lives were not calculated for the site monitoring wells.

- ***Upgradient of PRB*** – Reductive dechlorination daughter products were present, although at much lower concentrations than the parent compounds. For example, in monitoring well C-4A, the concentrations of 1,1,1-TCA (2,700 µg/L) and 1,1-

DCA (7,000 µg/L) were an order of magnitude higher than CA (480 µg/L) and the concentration of cis-1,2-DCE (3,100 µg/L) was two orders of magnitude higher than VC (52 µg/L) (Table 3-4). The chlorinated solvent concentrations suggest that limited reductive dechlorination is occurring.

- ***Fuel-Related Compounds (BTEX)*** – Petroleum hydrocarbons were also present in groundwater samples collected during the same sampling event, with benzene and toluene exceeding their respective MCLs. In well C4-A, the benzene concentration (44 µg/L) was much less than the toluene concentration (1,400 µg/L) (Table 3-4). The benzene-to-toluene ratio (0.31) is indicative of an area where no biodegradation has occurred or where residual fuels continue to dissolve into the aquifer.

- ***Downgradient of PRB*** – 1,1,1-TCA was non-detect in all monitoring wells. Although 1,1-DCE and cis-1,2-DCE exceeded established MCLs in multiple downgradient wells, the concentrations of those compounds was significantly lower than upgradient of the PRB (Table 3-4). The VC concentration was higher downgradient of the PRB compared to upgradient of the PRB, with a maximum concentration of 340 µg/L, likely due to reductive dechlorination of 1,1-DCE and cis-1,2-DCE (Table 3-4).

- ***BTEX*** – BTEX concentrations downgradient of the PRB were similar to upgradient concentrations, which is expected since the zero-valent iron filling in the PRB does not reduce benzene and toluene. The toluene concentrations decrease with distance from the PRB, with a maximum concentration of 980 µg/L in well C-3A to non-detect (detection limit 1 µg/L) in the vicinity of wells C-9C, C-12, and C-14, while the benzene concentrations remain consistent. Thus, the benzene-to-toluene ration decreases with distance from the PRB, which is indicative of anaerobic biodegradation of petroleum hydrocarbons in the swamp.

- Three flow transects have historically been used to calculate attenuation rate constants and half-lives within the PRB area. The rate constant and half-life calculations are summarized in Table 4-1 and the calculations are included in Appendix D. Compared to historical values, the rate constant calculated from the April 2005 data have decreased slightly for 1,1-DCE and 1,1-DCA and increased for CA and VC, and benzene (Shaw, 2004), indicating the attenuation and biodegradation are reducing contaminant concentrations with distance from the PRB. Rate constants and half-lives were not calculated in the North Transect for 1,1-DCE, cis-1,2-DCE, and benzene; Middle Transect for 1,1-DCE; and South Transect for 1,1-DCA, 1,1-DCE, cis-1,2-DCE, and VC due to non-detect contaminant values in two or more wells of that transect.

- ***C-1 Area*** – 1,1,1-TCA was detected at low concentrations and did not exceed the 200 µg/L MCL in any wells. The concentrations of the less chlorinated ethenes (DCE and VC) exceeded their established MCLs, but have decreased overall compared to historical values. The concentrations of the less chlorinated ethanes

(DCE and CA) were elevated, but do not have established MCLs, and have decreased since previous sampling events. The overall decrease in chlorinated solvent concentrations, low levels of 1,1,1-TCA, and presence of daughter products are indicative of anaerobic reductive dechlorination.

- Benzene was detected in three of the seven wells sampled. The benzene concentration has steadily increased in monitoring well C-16 since May 2003 to a maximum concentration of 140 µg/L (April 2005), and fluctuated at lower concentrations in wells C-15 and C-17 (Table 3-4). Toluene was non-detect in the benzene-impacted wells (Table 3-4). The presence of benzene and absence of toluene suggests that anaerobic biodegradation of petroleum hydrocarbons has occurred.

- Time-dependent attenuation rate constants and half-lives were calculated for 1,1-DCE, cis-1,2-DCE, and VC. The time-dependent rate constants and half-lives were calculated using contaminant data from May 2003, April 2004, and April 2005 from monitoring well C-15, which currently exhibits the highest concentrations of chlorinated ethenes in the C-1 area. A 1,1-DCE concentration versus time attenuation rate constant of 0.0023 per day was calculated, which results in a 1,1-DCE half life of 0.8 years. A cis-1,2-DCE attenuation rate constant of 0.0009 per day was calculated, which results in a cis-1,2-DCE half life of 2.1 years (Table 4-1). A VC attenuation rate constant of 0.0008 per day was calculated, which results in a VC half-life of 2.4 years (Table 4-1). Based on the time-dependent attenuation rate constants, attenuation of VC appears to be the rate limiting step in the C-1 area.

4.3 Geochemical Concentrations

DO, ORP, ferrous iron, methane, ethane, ethene, and pH were evaluated as indicators of biodegradation of chlorinated solvents and petroleum hydrocarbons. Geochemical data obtained during the April 2005 sampling event are included in Tables 3-2 and 3-4. The following conclusions summarize observations from the geochemical data for the PRB area, the C-1 area, and in Site Monitoring Wells.

- ***Site Monitoring Wells*** – The DO values varied widely in the site monitoring wells. However, the ORP values were greater than 50 mV indicating that the groundwater is primarily under oxidizing conditions, except in the vicinity of MW-122A (Table 3-4). Ferrous iron, methane, ethane, and ethene were non-detect or present at trace levels, which correlates with the ORP data (Table 3-2). The pH in some wells was below 5.0 in wells MW-115 A, MW-117, and PZ-103 (Table 3-2), which is outside the optimal range for microbial activity and may inhibit biodegradation.

- ***Upgradient of PRB*** – The DO and ORP values are elevated, which is indicative of aerobic conditions (DO >1 mg/L, ORP >50 mV). Ferrous iron was not

sampled, and methane, ethane, and ethene were non-detect (Table 3-4). 1,1,1-TCA is not known to degrade under aerobic conditions, which correlates with the high 1,1,1-TCA concentrations and low levels of reductive dechlorination daughter products observed upgradient of the PRB. BTEX degrades rapidly under aerobic conditions.

- ***Downgradient of PRB*** – The DO and ORP values are depressed, which is indicative of anaerobic conditions (DO <1 mg/L, ORP <50 mV). Ferrous iron concentrations are elevated above 1 mg/L in the impacted wells (Table 3-4), but have decreased compared to previous sampling events (Shaw, 2004), suggesting that iron reduction is no longer occurring. Dissolved methane levels were elevated compared to historical values (Shaw, 2004), which indicates that methanogenic conditions are predominant in the contaminated groundwater. The presence of ethene and ethane in the impacted wells (Table 3-4), correlates with the highly reducing, methanogenic conditions observed, and confirms that complete reductive dechlorination is occurring downgradient of the PRB. The pH was acidic in the vicinity of wells C-3A, C-5A, C-9A, and C-11 (Table 3-2), which is below the operable range of pH 6-8 and may inhibit microbial activity.

- ***C-1 Area*** – The DO and ORP values are indicative of anaerobic conditions in the vicinity of monitoring wells C-15, C-16, and C-17, which are impacted with chlorinated solvents and petroleum hydrocarbons. Ferrous iron concentrations are elevated above 1 mg/L in the impacted wells (Table 3-3), but have decreased significantly in recent years (Shaw, 2004), suggesting that iron reduction is no longer occurring. Dissolved methane levels were elevated compared to historical values (Shaw, 2004) and indicates that methanogenic conditions are predominant in the contaminated groundwater. Ethene and ethane are also present at elevated concentrations, which is indicative of complete reductive dechlorination (Table 3-4). The other monitoring wells in the C-1 area, which are not impacted with contaminants, exhibited aerobic conditions. Aerobic biodegradation of BTEX has likely depleted the DO and established anaerobic conditions in the vicinity of the impacted wells. Highly reducing, anaerobic conditions are necessary for complete reductive dechlorination; however, only limited biodegradation of benzene occurs under methanogenic conditions. The pH was slightly acidic in the C-1 area, ranging from 4.58 to 6.06 (Table 3-2), which may inhibit some microbial activity.

5.0 Conclusions and Recommendations

5.1 Conclusions

Results from OU-4/SWMU 59 LTM activities have been presented in the preceding chapters. The activities included water level measurements, annual sampling and monitoring of groundwater, statistical trend analysis of the analytical results, reporting of the remedial progress and the effectiveness of the PRB, and a natural attenuation evaluation.

5.1.1 Groundwater and Surface Water Monitoring

Groundwater/surface water monitoring was performed during April 2005. Groundwater flow directions have not changed overall since installation of the PRB. Flow is to the east toward Long Branch Creek with a slight southward trend south of the PRB, consistent with previous findings. Field-measured groundwater quality parameters (temperature, pH, conductivity, turbidity, DO, and redox) were within the expected range when compared with the results from previous sampling events and were within the expected range for wells within the PRB treatment zone. The distribution of groundwater contaminants in the PRB area has decreased. The distribution of contaminants in the C-1 area remains delineated, and appears stable. The MK trend analysis was performed on data from the PRB wells and C-1 area wells and showed mostly decreasing concentrations for chlorinated compounds, with the exception of the C-1 well.

5.1.2 Permeable Reactive Barrier and the C-1 Area

Performance of the PRB has remained relatively the same since July 1999, with the majority of contaminants being degraded within the PRB treatment zone, as expected. As of April 2005, it is calculated that 83 pore volumes have passed through the PRB zone. The groundwater system and contaminant flux through the PRB are near steady-state conditions, as indicated by decreasing trends of DCE along all transects and of VC downgradient of the PRB. Both DCE and VC remain above the remedial action levels downgradient of the PRB. DCE and VC are complicated by compound degradation and desorption processes occurring within the PRB treatment zone, in addition to the production of VC from the PRB degradation process. The MK evaluation was applied to analytical results from January 1999 through April 2005 and verified mostly decreasing trends in site wells and PRB wells. The MK evaluation was applied to available analytical results for the C-1 area and showed that concentrations in well C-1 are increasing, while the other wells remained relatively the same or were decreasing in most cases. Well C-17 located within 100 feet of Long Branch Creek showed increasing VC; however,

surface water collected from Long Branch Creek showed only CA and cis-DCE were detected and did not exceed surface water standards, and no other VOCs were detected.

5.1.3 Monitored Natural Attenuation

Based on the results from the April 2005 groundwater sampling event at OU-4, it appears that the PRB is continuing to reduce 1,1,1-TCA concentrations in groundwater and that natural attenuation processes, including biodegradation, are reducing contaminant concentrations in groundwater downgradient and to the south of the PRB. 1,1,1-TCA concentrations are elevated and the groundwater is more aerobic upgradient of the PRB. Elevated concentrations of toluene and the presence of other petroleum hydrocarbons suggest that dissolve-phase BTEX remain in the aquifer. However, groundwater downgradient of the PRB is under anaerobic conditions and complete reductive dechlorination is occurring based on decreasing contaminant concentrations and the production of ethene and ethane. Similarly, complete reductive dechlorination is occurring under highly reducing, methanogenic conditions in the C-1 area based on decreasing contaminant concentrations and elevated levels of methane, ethane, and ethene. Time-dependent attenuation rate constants suggest than degradation of VC is the rate-limiting step in the contaminated C-1 area groundwater. The site monitoring wells indicate that the area outside of the PRB influence is primarily under oxidizing conditions and that limited biodegradation is occurring. Additionally, low pH values in several wells across the site indicate that the slightly acidic groundwater may inhibit some microbial degradation.

5.2 Recommendations

Groundwater Monitoring: Shaw Environmental, Inc. recommends continued annual groundwater monitoring. Groundwater and surface water samples will be analyzed for VOCs and MNA parameters. Wells to be sampled will follow the same annual monitoring program presented in this report (Table 1-1). Since P- and PW- wells are no longer monitored, it is recommended these wells be abandoned.

If VOCs are detected in Long Branch Creek with concentrations above MCL; the following contingency plan steps will apply:

1) Contact SAFB, USACE, SCDHEC with informational data that summarize current data and illustrate the concern at hand.

2) Develop a plan of action.

3) Obtain approval of the plan of action from SAFB, USACE, and SCDHEC.

4) Implement plan of action upon availability and receipt of required funding.

6.0 References

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TABLES

Table 1-1

Current LTM Program for OU-4
Shaw Air Force Base, South Carolina

(Page 1 of 2)

Site Name: Operable Unit #4
SWMU: SWMU 59
ERP Site: FT-01

Last updated: 11/05/03..JMBartel

Well Associated With Site:	[U]pgradient, [D]owngradient, [S]idegradient, [P]erformance or Site Monitoring Well [MW]	Well ID	Current LTM: Annual Event (2nd quarter)	Screen Depth (Feet Below Ground Surface)	Aquifer: Upper Duplin	Aquifer: Lower Duplin	Aquifer: Lang Syne	Groundwater Elevation Meaurements	Analytical Parameters: VOCs (8260B) - each event	Analytical Parameters:
OU-4	S	C-1	X	5-25	X			X	X	X, a
OU-4	U	C-2A	X	2-12	X			X	X	X
OU-4	U	C-2B		14-24	X			X	X	X
OU-4	D	C-3A	X	2-12	X			X	X	X, a
OU-4	D	C-3B	X	14-24	X			X	X	X
OU-4	D	C-3C	X	25-35	X			X	X	X
OU-4	U	C-4A	X	2-12	X			X	X	X
OU-4	U	C-4B		14-24	X			X	X	X
OU-4	U	C-4C		25-35	X			X	X	X
OU-4	D	C-5A	X	2-12	X			X	X	X, a
OU-4	D	C-5B	X	14-24	X			X	X	X
OU-4	D	C-5C	X	25-35	X			X	X	X
OU-4	D	C-6A		2-12	X			X	X	X, a
OU-4	D	C-7A	X	2-12	X			X	X	X, a
OU-4	U	C-8A	X	2-12	X			X	X	X
OU-4	U	C-8B		14-24	X			X	X	X
OU-4	D	C-9A	X	2-12	X			X	X	X,a
OU-4	D	C-9B	X	14-24	X			X	X	X
OU-4	D	C-9C	X	25-35	X			X	X	X
OU-4	S	C-10	X	5-25	X			X	X	X, a
OU-4	D	C-11	X	1-6	X			X	X	X, a
OU-4	D	C-12	X	.5-5.5	X			X	X	X, a
OU-4	D	C-13	X	.5-5.5	X			X	X	X, a
OU-4	D	C-14	X	0.5-5.5	X			X	X	X, a
OU-4	D	C-15	X	12-22	X			X	X	X, a
OU-4	D	C-16	X	2-12	X			X	X	X, a
OU-4	D	C-17	X	0.5-5.5	X			X	X	X, a
OU-4	D	C-18	X	15-25	X			X	X	X, a
OU-4	D	C-19	X	0.5-5.5	X			X	X	X, a
OU-4	D	C-20	X	7-17	X			X	X	
OU-4	D	C-21	X	15-25	X			X	X	
OU-4	P	P-1A		2-12	X			X	X	X
OU-4	P	P-2A		2-12	X			X	X	X
OU-4	P	P-2B		14-24	X			X	X	X
OU-4	P	P-3A		2-12	X			X	X	X
OU-4	P	PW-1A		2-12	X			X	X	
OU-4	P	PW-2A		2-12	X			X	X	
OU-4	P	PW-3A		2-12	X			X	X	
OU-4	P	PW-3B		14-24	X			X	X	
OU-4	P	PW-4A		2-12	X			X	X	
OU-4	P	PW-5A		2-12	X			X	X	
OU-4	P	PW-6A		2-12	X			X	X	
OU-4	P	PW-6B		14-24	X			X	X	
OU-4	P	PW-7A		2-12	X			X	X	
OU-4	P	PW-8A		2-12	X			X	X	

Table 1-1

Current LTM Program for OU-4
Shaw Air Force Base, South Carolina

(Page 2 of 2)

Site Name: Operable Unit #4
SWMU: SWMU 59
ERP Site: FT-01

Last updated: 11/05/03..JMBartel

Well Associated With Site:	[U]pgradient, [D]owngradient, [S]idegradient, [P]erformance or Site Monitoring Well [MW]	Well ID	Current LTM: Annual Event (2nd quarter)	Screen Depth (Feet Below Ground Surface)	Aquifer: Upper Duplin	Aquifer: Lower Duplin	Aquifer: Lang Syne	Groundwater Elevation Meaurements	Analytical Parameters: VOCs (8260B) - each event	Analytical Parameters:
OU-4	MW	M1P1		10-35	X			X	X	
OU-4(formerly AOC-32)	MW	MW-1	X	9-19	X			X	X	
OU-4(formerly AOC-32)	MW	MW-57		9-19	X			X	X	
OU-4(formerly AOC-32)	MW	MW-58		10-20	X			X	X	
OU-4	MW	MW-105	X	5-14.7	X			X	X	
OU-4	MW	MW-105D		164-174				X		
OU-4	MW	MW-106		19.3-24.3	X			X	X	
OU-4	MW	MW-106D		167-177				X		
OU-4	MW	MW-107		14.9-19.9	X			X	X	
OU-4	MW	MW-111		22.6-27.6	X			X	X	
OU-4	MW	MW-112	X	10-25	X			X	X	
OU-4	MW	MW-112A		79.6-89.2		X		X		
OU-4	MW	MW-112D		142.7-152.7				X		
OU-4	MW	MW-113		5-20	X			X	X	
OU-4	MW	MW-113A		20-35		X		X		
OU-4	MW	MW-114	X	5-20	X			X	X	
OU-4	MW	MW-115		3-18	X			X	X	
OU-4	MW	MW-115A	X	59.1-68.6		X		X	X	
OU-4	MW	MW-116		8.3-22.8	X			X	X	
OU-4	MW	MW-116A		85.2-94.7		X		X		
OU-4	MW	MW-117	X	6.5-20.9	X			X	X	
OU-4	MW	MW-118	X	0.9-10.4	X			X	X	a
OU-4	MW	MW-119A		59.9-70.3		X				
OU-4	MW	MW-120	X	15-25	X			X	X	
OU-4	MW	MW-120A		35-45	X			X	X	
OU-4	MW	MW-120B		60-70		X		X	X	
OU-4	MW	MW-121		25-35	X			X		
OU-4	MW	MW-121A		12-22	X			X		
OU-4	MW	MW-122		25-35	X			X		
OU-4	MW	MW-122A	X	14.7-24.7	X			X	X	
OU-4	MW	PZ-101	X	20-30	X			X		
OU-4	MW	PZ-103	X	25-35	X			X		
OU-4	na	SWS-201	X	Surface Water					X	
OU-4	na	SWS-202	X	Surface Water					X	
OU-4	na	SWS-203	X	Surface Water					X	
OU-4	na	SWS-204	X	Surface Water					X	
OU-4	na	SWS-205	X	Surface Water					X	
OU-4	na	SWS-206	X	Surface Water					X	
Current LTM: Total Wells Sampled			43							

Notes:

TBD - To be determined prior to installation.
wq - Water quality parameters only will be collected from these wells.

Table 3-1

Groundwater Elevations
November 2004 and April 2005
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

Well ID	TOC (ft msl)	Nov-04 DTW (ft)	Groundwater Elevation (ft msl)	Product Thickness (ft)	Apr-05 DTW (ft)	Groundwater Elevation (ft msl)	Product Thickness (ft)	Change In Head from Nov-04 to Apr-05 (ft)
Site Monitoring Wells								
MW-1	220.10	16.18	203.92	NP	16.20	203.90	NP	0.02
MW-57	219.28	15.93	203.35	NP	15.90	203.38	NP	-0.03
MW-58	222.90	20.73	202.17	NP	20.93	201.97	NP	0.20
MW-105	214.87	13.88	200.99	NP	13.85	201.02	NP	-0.03
MW-106	219.21	18.02	201.19	NP	17.73	201.48	NP	-0.29
MW-107	214.79	11.88	202.91	NP	11.85	202.94	NP	-0.03
MW-111	227.08	21.87	205.21	NP	21.93	205.15	0.05	0.06
MW-112	218.01	15.48	202.53	NP	15.35	202.66	NP	-0.13
MW-113	208.95	7.38	201.57	NP	7.15	201.80	NP	-0.23
MW-114	207.10	7.50	199.60	NP	7.10	200.00	NP	-0.40
MW-115	205.14	4.82	200.32	NP	4.43	200.71	NP	-0.39
MW-115A	204.16	7.82	196.34	NP	7.79	196.37	0.05	-0.03
MW-116	219.46	15.87	203.59	NP	15.72	203.74	NP	-0.15
MW-117	216.42	15.96	200.46	NP	14.81	201.61	NP	-1.15
MW-118	203.51	4.39	199.12	NP	4.00	199.51	NP	-0.39
MW-120	217.10	15.87	201.23	0.10	15.63	201.47	0.03	-0.24
MW-120A	217.46	15.86	201.60	NP	15.65	201.81	NP	-0.21
MW-120B	217.51	19.82	197.69	NP	19.81	197.70	NP	-0.01
MW-121	218.50	15.85	202.65	NP	15.80	202.70	NP	-0.05
MW-121A	218.76	16.08	202.68	NP	16.00	202.76	NP	-0.08
MW-122	218.59	16.62	201.97	NP	16.55	202.04	NP	-0.07
MW-122A	218.59	16.36	202.23	NP	16.30	202.29	NP	-0.06
M1P1	213.72	15.44	198.28	NP	15.38	198.34	NP	-0.06
PZ-101	220.33	18.90	201.43	NP	18.97	201.36	NP	0.07
PZ-103	220.94	19.68	201.26	NP	19.80	201.14	NP	0.12
MW-105D	215.11	44.89	170.22	NP	NM	NA	NA	NA
MW-106D	219.02	47.05	171.97	NP	NM	NA	NA	NA
MW-116A		NM	NA	NA	21.81	NA	NP	NA
MW-112D	217.72	45.75	171.97	NP	NM	NA	NA	NA
Upgradient Compliance Wells								
C-2A	207.23	6.63	200.60	NP	6.85	200.38	NP	-0.22
C-2B	207.15	6.69	200.46	NP	6.20	200.95	NP	0.49
C-4A	207.27	6.92	200.35	NP	6.75	200.52	NP	0.17
C-4B	207.12	6.65	200.47	NP	6.80	200.32	NP	-0.15
C-4C	207.04	6.66	200.38	NP	6.55	200.49	NP	0.11
C-8A	207.43	7.02	200.41	NP	6.89	200.54	NP	0.13
C-8B	207.30	6.98	200.32	NP	6.73	200.57	NP	0.25

DTW - Depth to water.
ft - Feet.
msl - Mean sea level.
TOC - Top of casing.

NP - No product.
NM - Not measured.
NA - Not applicable.

Table 3-1

Groundwater Elevations
November 2004 and April 2005
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

Well ID	TOC (ft msl)	Nov-04 DTW (ft)	Groundwater Elevation (ft msl)	Product Thickness (ft)	Apr-05 DTW (ft)	Groundwater Elevation (ft msl)	Product Thickness (ft)	Change In Head from Nov-04 to Apr-05 (ft)
Sidegradient Compliance Wells								
C-1	204.89	4.95	199.94	NP	4.88	200.01	NP	0.07
C-10	206.08	6.25	199.83	NP	6.05	200.03	0.02	0.20
Downgradient Compliance Wells								
C-3A	204.90	5.13	199.77	NP	5.02	199.88	NP	0.11
C-3B	204.82	5.08	199.74	NP	4.98	199.84	NP	0.10
C-3C	204.77	5.00	199.77	NP	4.90	199.87	NP	0.10
C-5A	204.33	4.55	199.78	NP	4.43	199.90	NP	0.12
C-5B	204.23	4.51	199.72	NP	4.37	199.86	NP	0.14
C-5C	204.21	4.50	199.71	NP	4.38	199.83	NP	0.12
C-9A	204.74	4.95	199.79	NP	4.82	199.92	0.01	0.13
C-9B	204.70	4.93	199.77	NP	4.79	199.91	0.01	0.14
C-9C	204.74	5.05	199.69	NP	4.96	199.78	0.09	0.09
C-6A	201.49	2.81	198.68	NP	2.70	198.79	NP	0.11
C-7A	201.38	3.22	198.16	NP	3.00	198.38	NP	0.22
C-11	201.93	4.02	197.91	NP	3.89	198.04	NP	0.13
C-12	201.06	3.20	197.86	NP	3.15	197.91	NP	0.05
C-13	200.95	3.38	197.57	NP	3.25	197.70	NP	0.13
C-14	201.09	4.00	197.09	NP	3.85	197.24	NP	0.15
C-15	205.37	5.74	199.63	NP	5.68	199.69	NP	0.06
C-16	200.32	2.31	198.01	NP	2.20	198.12	NP	0.11
C-17	199.77	2.21	197.56	NP	2.10	197.67	NP	0.11
C-18	211.34	11.05	200.29	NP	4.43	206.91	NP	6.62
C-19	199.46	2.69	196.77	NP	2.55	196.91	NP	0.14
C-20	203.49	4.89	198.60	NP	4.82	198.67	NP	0.07
C-21	210.79	10.68	200.11	NP	10.85	199.94	NP	-0.17
Treatment Zone Performance Wells								
P-1A	206.22	5.95	200.27	NP	5.82	200.40	0.01	0.13
P-2A	205.96	5.85	200.11	NP	5.70	200.26	NP	0.15
P-2B	205.98	5.87	200.11	NP	5.70	200.28	NP	0.17
P-3A	205.08	5.19	199.89	NP	5.05	200.03	NP	0.14
PW-1A	206.53	NM	NA	NP	dry	dry	NA	NA
PW-2A	204.84	5.10	199.74	NP	5.73	199.11	NP	-0.63
PW-3A	206.52	NM	NA	NA	NM	NA	NA	NA
PW-3B	206.48	7.02	199.46	NP	NM	NA	NA	NA
PW-4A	206.17	4.80	201.37	NP	3.40	202.77	NP	1.40
PW-5A	205.93	6.42	199.51	NP	6.40	199.53	NP	0.02
PW-6A	204.35	4.57	199.78	NP	5.39	198.96	NP	-0.82
PW-6B	204.56	4.91	199.65	NP	4.79	199.77	NP	0.12
PW-7A	207.12	7.36	199.76	NP	dry	dry	NA	NA
PW-8A	205.19	5.52	199.67	NP	4.35	200.84	NP	1.17

DTW - Depth to water.
ft - Feet.
msl - Mean sea level.
TOC - Top of casing.
NP - No product.
NM - Not measured.
NA - Not applicable.

Table 3-2

Groundwater and Surface Water Quality Parameters, April 2005
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

WELL ID	TEMPERATURE (°C)	pH	CONDUCTIVITY (mMhos/cm)	TURBIDITY (NTU)	DISSOLVED OXYGEN (mg/L)	REDOX (mV)
PRB Monitoring Wells - Downgradient of the PRB						
C1	16.5	3.26	0.230	0.91	0.35	201.7
C2A	16.9	5.15	0.004	124	3.25	221.7
C3A	16.6	3.90	0.308	12.2	0.20	71.9
C3B	18.0	4.02	0.403	0.81	0.00	-11.4
C3C	19.7	4.80	0.027	8.72	3.88	176.1
C4A	18.0	5.62	0.074	5.72	1.49	88.8
C5A	17.3	0.54	0.118	0.00	0.41	12.0
C5B	18.8	6.92	0.091	0.00	0.27	-24.8
C5C	18.1	4.67	0.057	6.45	0.80	94.0
C7A	18.9	6.29	0.044	6.50	0.14	123.8
C-8A	16.6	6.18	0.072	132	0.23	170.8
C9A	17.6	2.95	0.031	3.00	0.31	-585.0
C9B	18.5	6.61	0.122	0.00	0.23	-121.5
C9C	16.4	5.15	0.010	1.92	0.31	226.2
C10	18.0	1.87	0.142	1.00	0.10	375.0
C11	18.0	4.54	0.002	6.20	1.39	221.0
C12	15.3	5.49	0.039	5.41	0.05	211.3
C13	16.7	7.10	0.181	7.80	0.11	-63.7
C14	15.3	5.65	0.086	8.20	0.13	63.2
C-1 Area Monitoring Wells - South of the PRB						
C15	16.8	6.06	0.269	0.42	0.25	65.0
C16	15.9	5.98	0.259	17.0	1.01	-40.8
C17	16.1	5.67	0.092	16.0	0.38	73.0
C18	16.2	4.58	0.007	9.80	3.16	247.0
C19	14.8	5.23	0.032	112	3.76	119.2
C20	17.3	4.90	0.160	2.31	1.32	93.4
C21	19.3	4.76	0.090	5.90	3.17	204.9
Site Monitoring Wells						
MW-1	18.2	5.48	0.077	above range	5.11	350.0
MW-105	16.1	5.51	0.036	5.33	2.30	240.0
MW-112	20.5	6.03	0.074	8.89	0.30	88.5
MW-114	15.9	5.28	0.023	3.71	0.20	224.8
MW-115A	18.8	4.36	0.055	0.00	7.73	200.0
MW-117	19.1	4.18	0.117	5.82	0.13	100.2
MW-118	15.7	5.50	0.152	0.37	1.97	239.5
MW-120	**	**	**	**	**	**
MW-122A	21.8	6.32	0.216	2.00	3.40	-48.2
PZ-101	19.6	6.00	0.066	35.3	7.65	180.3
PZ-103	20.3	4.58	0.113	17.0	3.53	182.4

Notes:
** - Product Found No Data Recorded
°C - Degrees Celsius.
mg/L - milligrams per liter.
mMhos/cm - milliMhos per centimeter.
mV - millivolts.
NTU - Nephelometric turbidity units.

Table 3-3

Comparison of Select
Groundwater Quality Parameters, PRB Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

WELL ID	FERROUS IRON (FILTERED - mg/L)								
	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Mar-03	Jan-04	Apr-04	Apr-05
C1	1.03	2.45	1.52	2.03	2.81	0.53	2.12	0.52	0.25
C2A	1.53	6.80	6.80	8.35	5.70	4.30	NS	NS	NS
C2B	1.17	5.55	4.40	4.55	5.50	3.94	NS	NS	NS
C3A	3.00	2.20	3.30	4.80	6.02	5.32	NS	2.28	1.08
C3B	2.92	0.29	2.64	1.56	0.46	0.00	NS	NS	NS
C3C	0.10	0.00	0.09	0.31	0.33	0.29	NS	NS	NS
C4A	3.25	10.10	8.70	8.20	15.50	10.20	NS	NS	NS
C4B	2.64	2.25	1.61	1.02	0.82	1.28	NS	NS	NS
C4C	0.20	0.00	0.00	0.00	0.00	0.00	NS	NS	NS
C5A	2.42	7.00	8.20	11.95	14.70	15.90	NS	5.70	1.51
C5B	2.61	2.05	0.72	0.32	0.37	0.68	NS	NS	NS
C5C	0.13	0.10	0.21	0.13	0.12	0.09	NS	NS	NS
C6A	2.59	2.85	2.04	1.84	0.99	0.68	NS	NS	NS
C7A	2.60	2.81	1.74	1.38	1.11	1.31	NS	0.02	0.65
C8A	3.29	15.90	13.60	12.10	24.80	11.30	NS	NS	NS
C8B	0.81	2.15	1.75	2.05	1.28	2.27	NS	NS	NS
C9A	2.45	3.35	2.72	1.48	1.62	1.92	NS	1.30	0.21
C9B	2.30	4.35	2.16	1.93	2.06	2.98	NS	NS	NS
C9C	0.25	0.26	0.16	0.16	0.14	0.20	NS	NS	NS
C10	1.99	4.55	3.38	11.40	31.30	11.70	NS	1.03	3.25
C11	Wells installed 1/4/00	1.00	0.00	2.44	1.58	1.41	NS	1.25	0.63
C12		3.28	0.16	1.32	2.32	3.28	NS	5.20	1.09
C13		1.85	9.08	6.00	32.50	2.59	NS	1.64	1.06
C14		0.03	0.50	3.70	3.26	1.47	NS	4.52	0.97
C15	Wells were installed May 2003.					1.94	3.22	3.00	1.26
C16						4.90	14.20	12.90	1.64
C17						7.80	13.70	13.80	1.14
C18						0.00	0.06	0.08	0.00
C19						10.68	4.30	2.90	0.95
C20	Wells installed October 2003.						0.51	NS	0.00
C21							0.11	NS	0.01
P1A	3.30	19.70	21.60	22.60	>33	>33	3.10	NS	NS
P2A	3.12	9.60	11.90	9.90	26.40	32.80	9.50	NS	NS
P2B	2.48	2.60	4.44	3.03	2.64	2.60	2.40	8.90	NS
P3A	1.97	10.25	8.50	10.95	17.60	22.20	9.20	NS	NS
PW1A	0.00	0.00	NS	4.55	2.73	NS	0.01	0.02	NS
PW2A	NS	NS	NS	0.00	NM	NS	0.18	0.04	NS
PW3A	3.04	1.25	NS	11.60	NM	NS	1.92	0.44	NS
PW3B	0.91	0.98	NS	NS	NS	NS	3.24	3.78	NS
PW4A	2.00	0.00	NS	NS	NM	NS	NS	NS	NS
PW5A	0.00	0.00	NS	9.65	0.17	NS	0.28	0.02	NS
PW6A	2.32	3.60	NS	9.45	5.00	NS	4.60	4.40	NS
PW7A	2.44	1.28	NS	8.90	16.90	NS	8.60	6.40	NS
PW8A	0.48	0.34	NS	0.14	NM	NS	0.34	0.10	NS
Average upgradient	2.69	10.93	9.70	9.55	15.33	8.60	NS	NS	NS
Average downgradient	2.62	4.18	4.74	6.08	7.45	7.71	NS	3.09	0.93

Notes: Values for Average Upgradient were calculated using monitoring wells C2A, C4A, and C8A.
Values for Average Downgradient were calculated using monitoring wells C3A, C5A, and C9A.
NA - Not applicable.
mg/L - Milligrams per liter.
mV - Millivolts.
NM - Not measured.
NS - Not sampled during this event.

Table 3-3

Comparison of Select
Groundwater Quality Parameters, PRB Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

WELL ID	pH (SU)								
	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Mar-03	Jan-04	Apr-04	Apr-05
C1	5.76	5.89	5.85	4.84	6.00	5.47	6.36	5.46	3.26
C2A	5.95	5.72	5.63	5.00	5.68	5.32	NS	5.51	5.15
C2B	5.83	5.82	5.71	4.91	5.65	5.44	NS	NS	NS
C3A	6.12	6.25	5.50	5.32	5.92	5.84	NS	6.14	3.90
C3B	6.54	7.41	5.84	6.65	7.91	7.68	NS	6.74	4.02
C3C	5.11	4.60	4.77	3.83	4.88	4.88	NS	4.59	4.80
C4A	5.74	5.75	5.91	5.06	5.49	5.26	NS	5.20	5.62
C4B	5.61	5.67	5.17	4.68	5.38	5.48	NS	NS	NS
C4C	4.13	4.12	4.32	4.01	4.39	4.33	NS	NS	NS
C5A	5.85	6.19	5.15	5.28	6.03	5.83	NS	5.87	0.54
C5B	5.62	6.17	5.80	5.81	7.28	6.78	NS	6.81	6.92
C5C	4.23	4.28	3.84	3.38	4.63	4.55	NS	4.52	4.67
C6A	5.90	6.29	5.82	5.94	5.96	5.89	NS	NS	NS
C7A	5.82	7.23	5.80	5.99	5.65	5.61	NS	5.91	6.29
C8A	4.59	5.67	5.55	NS	5.53	NS	NS	**	6.18
C8B	5.47	5.27	4.81	5.01	5.25	5.38	NS	NS	NS
C9A	6.27	6.02	5.82	5.27	6.79	7.06	NS	6.56	2.95
C9B	6.38	6.51	6.24	5.37	7.12	7.26	NS	7.13	6.61
C9C	4.95	5.34	4.97	4.55	5.22	5.17	NS	4.98	5.15
C10	6.17	6.55	6.07	5.80	6.38	6.65	NS	6.75	1.87
C11	Wells installed 1/4/00	5.51	5.31	4.62	4.36	4.75	NS	5.01	4.54
C12		5.20	4.98	4.31	4.71	5.05	NS	5.12	5.49
C13		5.37	6.08	6.14	6.67	6.17	NS	6.48	7.10
C14		5.33	5.03	4.65	4.73	5.08	NS	5.57	5.65
C15	Wells were installed May 2003.					5.67	6.14	5.51	6.06
C16						5.92	7.47	5.88	5.98
C17						5.82	6.57	5.32	5.67
C18						4.80	4.89	4.39	4.58
C19						4.73	5.34	4.58	5.23
C20	Wells installed October 2003.						5.94	5.20	4.90
C21							5.30	4.51	4.76
P1A	5.95	6.53	6.46	5.73	6.34	6.29	NS	6.25	NS
P2A	6.25	6.76	6.70	6.05	6.89	6.50	NS	6.50	NS
P2B	5.91	6.61	6.31	5.81	7.07	7.15	NS	6.97	NS
P3A	6.37	6.45	6.45	5.69	6.45	6.38	NS	6.30	NS
PW1A	6.97	11.35	6.91	6.50	7.61	8.85	NS	9.77	NS
PW2A	NS	NS	7.84	5.81	7.58	7.57	NS	8.09	NS
PW3A	6.97	9.09	6.89	6.01	7.49	7.20	NS	6.65	NS
PW3B	6.97	6.67	NS	NS	NS	NS	NS	6.22	NS
PW4A	6.97	6.89	6.89	NS	NM	7.90	NS	NS	NS
PW5A	6.97	11.05	6.07	6.08	7.57	7.10	NS	7.98	NS
PW6A	6.96	6.98	6.22	5.91	6.69	6.82	NS	6.65	NS
PW7A	5.33	10.06	6.28	6.42	7.02	6.58	NS	6.43	NS
PW8A	6.76	10.45	9.21	6.37	9.09	7.76	NS	8.01	NS
Average upgradient	5.43	5.71	5.70	5.03	5.57	5.29	NS	5.36	5.65
Average downgradient	6.08	6.15	5.49	5.29	6.25	6.24	NS	6.19	2.46

Notes: Values for Average Upgradient were calculated using monitoring wells C2A, C4A, and C8A.
Values for Average Downgradient were calculated using monitoring wells C3A, C5A, and C9A.
NA - Not applicable.
mg/L - Milligrams per liter.
mV - Millivolts.
NM - Not measured.
NS - Not sampled during this event.

Table 3-3

Comparison of Select
Groundwater Quality Parameters, PRB Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

WELL ID	DISSOLVED OXYGEN (mg/L)								
	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Mar-03	Jan-04	Apr-04	Apr-05
C1	0.04	0.37	1.91	1.76	1.33	1.04	0.75	0.06	0.35
C2A	0.98	0.27	1.66	3.82	0.91	1.20	NS	1.59	3.25
C2B	1.92	1.46	1.40	3.70	1.11	1.15	NS	NS	NS
C3A	0.15	0.01	1.89	5.41	0.50	0.85	NS	0.04	0.20
C3B	0.76	0.07	1.27	3.58	0.86	1.07	NS	0.79	0.00
C3C	NM	1.16	3.80	3.42	1.38	1.90	NS	4.60	3.88
C4A	0.25	0.12	1.28	3.79	0.77	0.99	NS	0.49	1.49
C4B	0.72	1.41	2.87	4.19	3.41	2.97	NS	NS	NS
C4C	5.69	3.60	4.09	5.77	4.62	5.47	NS	NS	NS
C5A	0.86	0.02	1.85	4.61	1.03	0.68	NS	0.83	0.41
C5B	0.58	0.03	1.50	6.03	0.66	0.39	NS	0.08	0.27
C5C	0.05	0.10	2.35	3.41	1.65	1.67	NS	1.87	0.80
C6A	0.94	0.79	1.48	2.04	1.24	3.26	NS	NS	NS
C7A	0.35	0.73	1.87	1.67	1.03	8.32	NS	3.59	0.14
C8A	1.11	0.12	0.87	NS	1.15	NS	NS	**	0.23
C8B	0.11	3.51	3.94	4.44	3.18	3.30	NS	NS	NS
C9A	0.28	0.02	1.70	0.96	0.81	0.67	NS	0.30	0.31
C9B	0.04	0.02	1.41	3.59	0.76	0.70	NS	0.14	0.23
C9C	7.12	1.25	2.42	1.21	1.81	2.00	NS	2.65	0.31
C10	0.01	0.00	1.93	1.51	1.25	0.74	NS	0.13	0.10
C11	Wells installed 1/4/00	0.68	5.97	1.18	3.73	2.34	NS	3.96	1.39
C12		1.31	9.58	8.28	2.41	1.39	NS	1.59	0.05
C13		0.73	4.35	1.87	3.79	3.92	NS	5.02	0.11
C14		0.93	9.05	3.11	2.41	3.41	NS	4.26	0.13
C15	Wells were installed May 2003.					1.21	0.92	8.02	0.25
C16						1.40	1.21	4.05	1.01
C17						2.15	1.25	4.62	0.38
C18						1.49	4.13	3.11	3.16
C19						3.20	3.61	3.04	3.76
C20	Wells installed October 2003.						0.74	0.36	1.32
C21							4.46	7.66	3.17
P1A	0.18	1.32	1.70	4.36	0.55	0.87	NS	0.16	NS
P2A	0.20	0.54	1.13	3.58	0.80	3.26	NS	0.72	NS
P2B	0.25	0.01	1.08	3.47	0.90	0.69	NS	1.87	NS
P3A	0.07	0.11	0.25	3.02	0.60	0.50	NS	0.05	NS
PW1A	0.86	0.32	1.15	2.13	2.92	1.98	NS	2.06	NS
PW2A	NS	NS	1.39	1.68	2.52	1.12	NS	4.43	NS
PW3A	16.50	0.41	1.45	1.87	5.95	5.20	NS	8.62	NS
PW3B	0.55	1.96	NS	NS	NS	NS	NS	3.90	NS
PW4A	2.70	3.59	3.69	NS	NM	6.10	NS	NS	NS
PW5A	0.75	2.39	1.47	1.02	4.15	2.60	NS	4.82	NS
PW6A	1.75	0.89	0.81	1.59	2.27	1.99	NS	3.89	NS
PW7A	1.80	0.26	0.80	1.50	2.80	5.14	NS	9.13	NS
PW8A	0.18	0.32	1.65	3.45	5.80	4.40	NS	8.83	NS
Average upgradient	0.78	0.17	1.27	3.81	0.94	1.10	NS	1.04	1.66
Average downgradient	0.43	0.02	1.81	3.66	0.78	0.73	NS	0.39	0.31

Notes: Values for Average Upgradient were calculated using monitoring wells C2A, C4A, and C8A.
Values for Average Downgradient were calculated using monitoring wells C3A, C5A, and C9A.
NA - Not applicable.
mg/L - Milligrams per liter.
mV - Millivolts.
NM - No measurement.
NS - Not sampled during this event.

Table 3-3

Comparison of Select
Groundwater Quality Parameters, PRB Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

WELL ID	REDOX (mV)								
	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Mar-03	Jan-04	Apr-04	Apr-05
C1	10.0	-145.1	8.0	122.0	-78.8	77.7	95.80	126.5	201.7
C2A	26.7	-44.1	-61.0	7.7	-129.9	-19.7	NS	-51.6	221.7
C2B	9.0	-188.1	-49.0	21.8	-125.0	-40.4	NS	NS	NS
C3A	-104.0	-206.6	-59.0	-97.4	-239.4	-87.0	NS	-81.8	71.9
C3B	-205.0	-275.7	-138.0	-142.1	-506.2	-217.7	NS	-168.3	-11.4
C3C	101.0	-104.3	272.0	278.1	198.3	159.2	NS	271.8	176.1
C4A	-91.0	-89.2	-67.0	-10.6	-154.8	-45.3	NS	-62.1	88.8
C4B	-32.2	-93.0	3.0	99.6	26.6	9.6	NS	NS	NS
C4C	195.2	188.5	315.0	442.0	367.8	378.6	NS	NS	NS
C5A	-105.0	-243.3	-64.0	-84.6	-439.9	-90.9	NS	-49.3	12.0
C5B	-134.0	-73.4	-89.0	-102.4	-292.0	-185.0	NS	-118.3	-24.8
C5C	203.0	-227.8	33.0	239.1	55.9	25.8	NS	154.2	94.0
C6A	-25.0	-126.0	-85.0	-100.4	-72.9	-28.8	NS	NS	NS
C7A	-4.0	-143.0	-17.0	-65.0	-89.0	-18.4	NS	4.2	123.8
C8A	85.3	-81.6	-29.0	NS	-97.9	NS	NS	**	170.8
C8B	3.2	-259.9	13.0	151.8	-11.2	-63.7	NS	NS	NS
C9A	-177.0	-297.5	-235.0	-182.4	-363.1	-181.6	NS	-162.8	-585.0
C9B	-157.7	-278.4	-180.0	-89.3	-156.0	-201.2	NS	-184.7	-121.5
C9C	25.0	-251.0	-50.0	-318.5	-290.7	-212.0	NS	39.2	226.2
C10	-173.0	-167.3	-88.0	-135.9	-131.8	-123.5	NS	-156.4	345.0
C11	Wells installed 1/4/00	-31.0	20.0	258.6	130.0	125.2	NS	103.7	221.0
C12		-40.0	33.0	140.9	91.5	58.7	NS	26.0	211.3
C13		29.0	-39.0	-47.3	-59.3	-17.5	NS	-63.0	-63.7
C14		-32.0	90.0	221.9	105.7	103.4	NS	43.4	63.2
C15	Wells were installed May 2003.					59.6	53.5	46.2	65.0
C16						2.2	-75.6	-67.9	-40.8
C17						71.0	113.4	202.4	73.0
C18						224.9	189.9	506.9	247.0
C19						38.4	135.8	206.8	119.2
C20	Wells installed October 2003.						87.6	288.1	93.4
C21							169.9	519.4	204.9
P1A	-122.0	-240.4	-134.0	-129.3	-258.2	-156.7	NS	-130.8	NS
P2A	-185.0	-274.2	-116.0	-134.9	-245.2	-191.1	NS	-164.6	NS
P2B	-175.0	-224.1	-124.0	-91.4	-147.1	-197.5	NS	-142.8	NS
P3A	-180.8	-209.3	-109.0	-92.6	-307.0	-165.1	NS	-137.6	NS
PW1A	-222.0	-248.0	-225.0	-209.2	-328.7	-450.1	NS	13.6	NS
PW2A	NS	NS	-234.0	-432.7	-263.4	-255.0	NS	-128.8	NS
PW3A	-108.0	-239.0	-91.0	-63.6	-45.2	-63.6	NS	-70.5	NS
PW3B	-149.0	-153.0	NS	NS	NS	NS	NS	-83.1	NS
PW4A	-60.0	-99.0	-26.0	NS	NM	41.3	NS	NS	NS
PW5A	-230.0	-221.0	-75.0	-507.2	-124.2	-230.4	NS	-162.3	NS
PW6A	-75.0	-105.0	-94.0	-313.6	-239.2	-200.2	NS	-79.2	NS
PW7A	-42.0	-116.0	-112.0	-412.6	-317.3	-189.3	NS	-57.2	NS
PW8A	-188.0	-292.0	-285.0	-38.0	-35.7	-80.0	NS	-85.5	NS
Average upgradient	7.0	-71.6	-52.3	-1.5	-127.53	-32.50	NS	-56.85	160.43
Average downgradient	-128.7	-249.1	-119.3	-121.5	-347.47	-119.83	NS	-97.97	-167.03

Notes: Values for Average Upgradient were calculated using monitoring wells C2A, C4A, and C8A.
Values for Average Downgradient were calculated using monitoring wells C3A, C5A, and C9A.
NA - Not applicable.
mg/L - Milligrams per liter.
mV - Millivolts.
NM - No measurement.
NS - Not sampled during this event.

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	MW-1		MW-105		MW-105 DUP		MW-112		MW-114		MW-115A		MW-117		MW-118	
		SAMPLE NO.	OU041029		OU041030		OU041031		OU041032		OU041033		OU041034		OU041035		OU041036	
		SAMPLE DATE	14-Apr-05		14-Apr-05		14-Apr-05		15-Apr-05		14-Apr-05		15-Apr-05		19-Apr-05		14-Apr-05	
		SAMPLE PURPOSE	REG		REG		DUP		REG		REG		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
ETHANE	ug/L	NL	NS		NS		NS		NS		NS		0.5	U	NS		0.5	U
ETHYLENE	ug/L	NL	NS		NS		NS		NS		NS		0.5	U	NS		0.5	U
METHANE	ug/L	NL	NS		NS		NS		NS		NS		1.8	U	NS		23	
DICHLORODIFLUOROMETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
CHLOROMETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
VINYL CHLORIDE (VC)	ug/L	2.0	49	J	1	U	1	U	1	U	1	U	1	U	54		1	U
BROMOMETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
CHLOROETHANE	ug/L	NL	100		1	U	1	U	1	U	1.1		1	U	490		1	U
TRICHLOROFLUOROMETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,1-DICHLOROETHENE (DCE)	ug/L	7	28	J	1	U	1	U	1	U	1	U	1	U	37		1	U
CARBON DISULFIDE	ug/L	NL	250	U	5	U	5	U	5	U	5	U	5	U	10	U	5	U
ACETONE	ug/L	NL	1500	J	5	J	5	J	5	U	5	U	5	U	10	UJ	5	J
METHYLENE CHLORIDE	ug/L	5.0	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
trans-1,2-DICHLOROETHENE	ug/L	100	50	U	1	U	1	U	1	U	1	U	1	U	2.4		1	U
METHYL-TERT-BUTYL-ETHER (MTBE)	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,1-DICHLOROETHANE (DCA)	ug/L	1080	340		1	U	1	U	1	U	4.2		1	U	700		1	U
2,2-DICHLOROPROPANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
cis-1,2-DICHLOROETHENE	ug/L	70	66		0.85	J	0.53	J	0.75	J	280	J	1	U	370		1	U
2-BUTANONE	ug/L	NL	250	U	5	U	5	U	5	U	5	U	5	U	10	UJ	5	U
BROMOCHLOROMETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
CHLOROFORM	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,1,1-TRICHLOROETHANE (TCA)	ug/L	200	430		1	U	1	U	1	U	1	U	1	U	280		1	U
1,1-DICHLOROPROPENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
CARBON TETRACHLORIDE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
BENZENE	ug/L	5.0	50	U	1	U	1	U	1.5		2.8		1	U	6.9		1	U
1,2-DICHLOROETHANE	ug/L	5.0	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
TRICHLOROETHENE (TCE)	ug/L	5.0	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,2-DICHLOROPROPANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
DIBROMOMETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
BROMODICHLOROMETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
cis-1,3-DICHLOROPROPENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
4-METHYL-2-PENTANONE	ug/L	NL	250	U	5	U	5	U	5	U	5	U	5	U	10	UJ	5	U
TOLUENE	ug/L	1000	50	U	1	U	1	U	3		29	J	1	U	180		1	U
trans-1,3-DICHLOROPROPENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,1,2-TRICHLOROETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
TETRACHLOROETHENE	ug/L	5.0	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,3-DICHLOROPROPANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
2-HEXANONE	ug/L	NL	250	U	5	U	5	U	5	U	5	U	5	U	10	U	5	U
DIBROMOCHLOROMETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	MW-1		MW-105		MW-105 DUP		MW-112		MW-114		MW-115A		MW-117		MW-118	
		SAMPLE NO.	OU041029		OU041030		OU041031		OU041032		OU041033		OU041034		OU041035		OU041036	
		SAMPLE DATE	14-Apr-05		14-Apr-05		14-Apr-05		15-Apr-05		14-Apr-05		15-Apr-05		19-Apr-05		14-Apr-05	
		SAMPLE PURPOSE	REG		REG		DUP		REG		REG		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-DIBROMOETHANE (EDB)	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
CHLOROBENZENE	ug/L	100	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,1,1,2-TETRACHLOROETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
ETHYLBENZENE	ug/L	700	50	U	1	U	1	U	170		42	J	1	U	35		1	U
m,p-XYLENES	ug/L	NL	68	J	2	U	2	U	540		100	J	2	U	92		2	U
o-XYLENE	ug/L	NL	34	J	1	U	1	U	3.5		30	J	1	U	45		1	U
STYRENE	ug/L	100	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
BROMOFORM	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
ISOPROPYLBENZENE	ug/L	NL	50	U	1	U	1	U	17		5.3		1	U	3		1	U
BROMOBENZENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,1,2,2-TETRACHLOROETHANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,2,3-TRICHLOROPROPANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
n-PROPYLBENZENE	ug/L	NL	50	U	1	U	1	U	25		7		1	U	4.8		1	U
2-CHLOROTOLUENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,3,5-TRIMETHYLBENZENE	ug/L	NL	62		1	U	1	U	86		13		1	U	6.1		1	U
4-CHLOROTOLUENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
tert-BUTYLBENZENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,2,4-TRIMETHYLBENZENE	ug/L	NL	82		1	U	1	U	270		50	J	1	U	26		1	U
sec-BUTYLBENZENE	ug/L	NL	50	U	1	U	1	U	4.1		1.1		1	U	2	U	1	U
1,3-DICHLOROBENZENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
p-ISOPROPYLTOLUENE	ug/L	NL	50	U	1	U	1	U	5.8		1	U	1	U	10		1	U
1,4-DICHLOROBENZENE	ug/L	75	50	U	1	U	1	U	1	U	1	U	1	U	7		1	U
n-BUTYLBENZENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,2-DICHLOROBENZENE	ug/L	600	50	U	1	U	1	U	1	U	1	U	1	U	12		1	U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
1,2,4-TRICHLOROBENZENE	ug/L	70	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
HEXACHLOROBUTADIENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
NAPHTHALENE	ug/L	NL	50	U	1	U	1	U	60		16		1	U	18		1	U
1,2,3-TRICHLOROBENZENE	ug/L	NL	50	U	1	U	1	U	1	U	1	U	1	U	2	U	1	U
TOTAL XYLENE	ug/L	10,000	110		2	U	2	U	560		140	J	2	U	140		2	U

Qual - Laboratory qualifier.

Laboratory Qualifiers
J - Estimated result detected above the method detection limit but below the reporting limit.
U - Not detected. The reporting limit is provided.
NL - Not listed.
NS - Not sampled.

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	MW-120		MW-122A		PZ-101		PZ-103		C1		C2A		C3A		C3B		C3C	
		SAMPLE NO.	OU041037		OU041038		OU041039		OU041040		OU041000		OU041001		OU041002		OU041003		OU041004	
		SAMPLE DATE	19-Apr-05		15-Apr-05		15-Apr-05		14-Apr-05		19-Apr-05		15-Apr-05		19-Apr-05		19-Apr-05		15-Apr-05	
		SAMPLE PURPOSE	REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
ETHANE	ug/L	NL	NS		NS		NS		NS		1		NS		120		NS		NS	
ETHYLENE	ug/L	NL	NS		NS		NS		NS		1.3		NS		210		NS		NS	
METHANE	ug/L	NL	NS		NS		NS		NS		350		NS		5700		NS		NS	
DICHLORODIFLUOROMETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
CHLOROMETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
VINYL CHLORIDE (VC)	ug/L	2.0	NS		1	U	1	U	1	U	90		6.4		340		120		25	
BROMOMETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
CHLOROETHANE	ug/L	NL	NS		1	U	1	U	1	U	520	J	95		20000	J	19000	J	250	
TRICHLOROFLUOROMETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,1-DICHLOROETHENE (DCE)	ug/L	7	NS		1	U	1	U	1	U	19		13		30		20	U	5.3	
CARBON DISULFIDE	ug/L	NL	NS		5	U	5	U	5	U	5	U	5	U	100	U	100	U	5	U
ACETONE	ug/L	NL	NS		5	U	5	U	5	J	5	U	5	U	100	U	100	U	5	U
METHYLENE CHLORIDE	ug/L	5.0	NS		1	U	1	U	1	U	1	U	1.5	U	20	U	20	U	1.6	U
trans-1,2-DICHLOROETHENE	ug/L	100	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
METHYL-TERT-BUTYL-ETHER (MTBE)	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,1-DICHLOROETHANE (DCA)	ug/L	1080	NS		1.8		1	U	1	U	260		270		220		160		33	
2,2-DICHLOROPROPANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
cis-1,2-DICHLOROETHENE	ug/L	70	NS		260		1	U	1	U	95		58		250		48		40	
2-BUTANONE	ug/L	NL	NS		5	U	5	U	5	U	5	U	5	U	100	U	100	U	5	U
BROMOCHLOROMETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
CHLOROFORM	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,1,1-TRICHLOROETHANE (TCA)	ug/L	200	NS		1	U	1	U	1	U	26		1	U	20	U	20	U	1	U
1,1-DICHLOROPROPENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
CARBON TETRACHLORIDE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
BENZENE	ug/L	5.0	NS		170		1	U	1	U	13		2.4		160		160		4	
1,2-DICHLOROETHANE	ug/L	5.0	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
TRICHLOROETHENE (TCE)	ug/L	5.0	NS		1	U	1	U	1	U	4.5		1	U	20	U	20	U	1	U
1,2-DICHLOROPROPANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
DIBROMOMETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
BROMODICHLOROMETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
cis-1,3-DICHLOROPROPENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
4-METHYL-2-PENTANONE	ug/L	NL	NS		5	U	5	U	5	U	5	U	5	U	100	U	100	U	5	U
TOLUENE	ug/L	1000	NS		8.7		1	U	1	U	1	U	19		980		730		7.1	
trans-1,3-DICHLOROPROPENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,1,2-TRICHLOROETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
TETRACHLOROETHENE	ug/L	5.0	NS		1	U	1	U	1	U	2.6		1	U	20	U	20	U	1	U
1,3-DICHLOROPROPANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
2-HEXANONE	ug/L	NL	NS		5	U	5	U	5	U	5	U	5	U	100	U	100	U	5	U
DIBROMOCHLOROMETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	MW-120		MW-122A		PZ-101		PZ-103		C1		C2A		C3A		C3B		C3C	
		SAMPLE NO.	OU041037		OU041038		OU041039		OU041040		OU041000		OU041001		OU041002		OU041003		OU041004	
		SAMPLE DATE	19-Apr-05		15-Apr-05		15-Apr-05		14-Apr-05		19-Apr-05		15-Apr-05		19-Apr-05		19-Apr-05		15-Apr-05	
		SAMPLE PURPOSE	REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-DIBROMOETHANE (EDB)	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
CHLOROBENZENE	ug/L	100	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,1,1,2-TETRACHLOROETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
ETHYLBENZENE	ug/L	700	NS		150		1	U	1	U	1	U	2.4		170		150		1.1	
m,p-XYLENES	ug/L	NL	NS		530		2	U	2	U	2	U	7.7		540		520		2.9	
o-XYLENE	ug/L	NL	NS		18		1	U	1	U	1	U	4.1		220		220		1.7	
STYRENE	ug/L	100	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
BROMOFORM	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
ISOPROPYLBENZENE	ug/L	NL	NS		10		1	U	1	U	1.2		1	U	20	U	15	J	1	U
BROMOBENZENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,1,2,2-TETRACHLOROETHANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,2,3-TRICHLOROPROPANE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
n-PROPYLBENZENE	ug/L	NL	NS		11		1	U	1	U	1	U	1	U	21		25		1	U
2-CHLOROTOLUENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,3,5-TRIMETHYLBENZENE	ug/L	NL	NS		40		1	U	1	U	1	U	1	U	46		56		1	U
4-CHLOROTOLUENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
tert-BUTYLBENZENE	ug/L	NL	NS		1.2		1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,2,4-TRIMETHYLBENZENE	ug/L	NL	NS		98		1	U	1	U	1	U	1.5		130		180		0.88	J
sec-BUTYLBENZENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,3-DICHLOROBENZENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
p-ISOPROPYLTOLUENE	ug/L	NL	NS		2.8		1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,4-DICHLOROBENZENE	ug/L	75	NS		1	U	1	U	1	U	4.2		1	U	30		38		0.91	J
n-BUTYLBENZENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
1,2-DICHLOROBENZENE	ug/L	600	NS		1.1		1	U	1	U	6.8		1	U	63		74		1.9	
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	NL	NS		1	U	1	U	2	U	1	U	1	U	20	U	20	U	1	U
1,2,4-TRICHLOROBENZENE	ug/L	70	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
HEXACHLOROBUTADIENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
NAPHTHALENE	ug/L	NL	NS		42		1	U	1	U	1	U	1	U	38	J	60	J	1	U
1,2,3-TRICHLOROBENZENE	ug/L	NL	NS		1	U	1	U	1	U	1	U	1	U	20	U	20	U	1	U
TOTAL XYLENE	ug/L	10,000	NS		550		2	U	2	U	2	U	12		770		740		4.8	

Qual - Laboratory qualifier.

Laboratory Qualifiers
J - Estimated result detected above the method detection limit but below the reporting limit.
U - Not detected. The reporting limit is provided.
NL - Not listed.
NS - Not sampled.

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	C3C DUP		C4A		C5A		C5B		C5C		C7A		C8A		C9A	
		SAMPLE NO.	OU041005		OU041006		OU041007		OU041008		OU041009		OU041010		OU041011		OU041012	
		SAMPLE DATE	15-Apr-05		15-Apr-05		19-Apr-05		15-Apr-05		14-Apr-05		19-Apr-05		14-Apr-05		19-Apr-05	
		SAMPLE PURPOSE	DUP		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
ETHANE	ug/L	NL	NS		NS		290		NS		NS		22		NS		17	
ETHYLENE	ug/L	NL	NS		NS		80		NS		NS		13		NS		11	
METHANE	ug/L	NL	NS		NS		6800		NS		NS		4000		NS		6300	
DICHLORODIFLUOROMETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
CHLOROMETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
VINYL CHLORIDE (VC)	ug/L	2.0	23		52		79		140		1	U	1	U	16		3	
BROMOMETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
CHLOROETHANE	ug/L	NL	210		480		13000	J	2300		8.7		930	J	160		68	J
TRICHLOROFLUOROMETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,1-DICHLOROETHENE (DCE)	ug/L	7	5.1		860		20	U	5.1	J	1	U	1	U	63		1	U
CARBON DISULFIDE	ug/L	NL	5	U	100	U	100	U	50	U	5	U	5	U	50	U	5	U
ACETONE	ug/L	NL	5	U	100	U	100	U	50	U	5	J	5	U	50	J	5	U
METHYLENE CHLORIDE	ug/L	5.0	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
trans-1,2-DICHLOROETHENE	ug/L	100	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
METHYL-TERT-BUTYL-ETHER (MTBE)	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,1-DICHLOROETHANE (DCA)	ug/L	1080	31		7000		41		130		2.8		8.3		3600		30	
2,2-DICHLOROPROPANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
cis-1,2-DICHLOROETHENE	ug/L	70	39		3100		65		110		0.67	J	1	U	270		1	U
2-BUTANONE	ug/L	NL	5	U	100	U	100	U	50	U	5	U	5	U	50	U	5	U
BROMOCHLOROMETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
CHLOROFORM	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,1,1-TRICHLOROETHANE (TCA)	ug/L	200	1	U	2700		20	U	10	U	1	U	1	U	150		1	U
1,1-DICHLOROPROPENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
CARBON TETRACHLORIDE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
BENZENE	ug/L	5.0	4		44		46		22		1	U	10		17		17	
1,2-DICHLOROETHANE	ug/L	5.0	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
TRICHLOROETHENE (TCE)	ug/L	5.0	0.55	J	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,2-DICHLOROPROPANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
DIBROMOMETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
BROMODICHLOROMETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
cis-1,3-DICHLOROPROPENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
4-METHYL-2-PENTANONE	ug/L	NL	5	U	100	U	100	U	50	U	5	U	5	U	50	U	5	U
TOLUENE	ug/L	1000	6.9		1400		250		260		1	U	4.6		450		22	
trans-1,3-DICHLOROPROPENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,1,2-TRICHLOROETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
TETRACHLOROETHENE	ug/L	5.0	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,3-DICHLOROPROPANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
2-HEXANONE	ug/L	NL	5	U	100	U	100	U	50	U	5	U	5	U	50	U	5	U
DIBROMOCHLOROMETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	C3C DUP		C4A		C5A		C5B		C5C		C7A		C8A		C9A	
		SAMPLE NO.	OU041005		OU041006		OU041007		OU041008		OU041009		OU041010		OU041011		OU041012	
		SAMPLE DATE	15-Apr-05		15-Apr-05		19-Apr-05		15-Apr-05		14-Apr-05		19-Apr-05		14-Apr-05		19-Apr-05	
		SAMPLE PURPOSE	DUP		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-DIBROMOETHANE (EDB)	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
CHLOROBENZENE	ug/L	100	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,1,1,2-TETRACHLOROETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
ETHYLBENZENE	ug/L	700	1	J	260		210		96		1	U	46		220		87	
m,p-XYLENES	ug/L	NL	2.9		960		700		290		2	U	92		830		180	
o-XYLENE	ug/L	NL	1.6		420		150		110		1	U	29		360		34	
STYRENE	ug/L	100	1	U	20	U	20	U	10	U	1	U	1	U	13		1	U
BROMOFORM	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
ISOPROPYLBENZENE	ug/L	NL	1	U	24		19	J	9.2	J	1	U	5.7		25		13	
BROMOBENZENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,1,2,2-TETRACHLOROETHANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,2,3-TRICHLOROPROPANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
n-PROPYLBENZENE	ug/L	NL	1	U	39		23		14		1	U	8		45		14	
2-CHLOROTOLUENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	46		1	U
1,3,5-TRIMETHYLBENZENE	ug/L	NL	1	U	110		55		32		1	U	10		160		29	
4-CHLOROTOLUENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
tert-BUTYLBENZENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	0.41	J	10	U	1	U
1,2,4-TRIMETHYLBENZENE	ug/L	NL	0.95	J	330		140		100		1	U	47		410		83	
sec-BUTYLBENZENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1.5		9.6	J	2.6	
1,3-DICHLOROBENZENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1.3		18		1	U
p-ISOPROPYLTOLUENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	12		1	U
1,4-DICHLOROBENZENE	ug/L	75	0.92	J	69		33		20		1	U	6		76		2.8	
n-BUTYLBENZENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	26		1	U
1,2-DICHLOROBENZENE	ug/L	600	2		120		20	U	39		1	U	11		130		1	U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
1,2,4-TRICHLOROBENZENE	ug/L	70	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
HEXACHLOROBUTADIENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
NAPHTHALENE	ug/L	NL	1.2		190		38	J	51		1	U	18	J	240		23	J
1,2,3-TRICHLOROBENZENE	ug/L	NL	1	U	20	U	20	U	10	U	1	U	1	U	10	U	1	U
TOTAL XYLENE	ug/L	10,000	4.6		1400		850		420		2	U	120		1200		220	

Qual - Laboratory qualifier.

Laboratory Qualifiers
J - Estimated result detected above the method detection limit but below the reporting limit.
U - Not detected. The reporting limit is provided.
NL - Not listed.
NS - Not sampled.

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	C9B		C9C		C10		C11		C11 DUP		C12		C13		C14		C-15	
		SAMPLE NO.	OU041013		OU041014		OU041015		OU041016		OU041017		OU041018		OU041019		OU041020		OU041021	
		SAMPLE DATE	15-Apr-05		14-Apr-05		19-Apr-05		15-Apr-05		15-Apr-05		14-Apr-05		19-Apr-05		19-Apr-05		20-Apr-05	
		SAMPLE PURPOSE	REG		REG		REG		REG		DUP		REG		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
ETHANE	ug/L	NL	NS		NS		150		8.9		0.5	U	1.8		200	J	21	J	290	
ETHYLENE	ug/L	NL	NS		NS		0.5	U	9.4		8.8		1.7	J	0.5	J	5.2	J	62	
METHANE	ug/L	NL	NS		NS		6300		4400		4500		1300		3600	J	800	J	6300	
DICHLORODIFLUOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
CHLOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
VINYL CHLORIDE (VC)	ug/L	2.0	1	U	1	U	1	U	2.8		2.8		1.5		10	U	2.3		180	
BROMOMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
CHLOROETHANE	ug/L	NL	340		2.9		1.1	J	31		30		4.3		5700		1800	J	790	
TRICHLOROFLUOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,1-DICHLOROETHENE (DCE)	ug/L	7	1	U	1	U	1	U	8		7.4		2.9		10	U	5.6		20	
CARBON DISULFIDE	ug/L	NL	5	U	5	U	5	U	5	U	5	U	5	U	50	U	10	U	10	U
ACETONE	ug/L	NL	5	U	5	J	5	U	5	U	34		5	UJ	50	UJ	10	U	10	UJ
METHYLENE CHLORIDE	ug/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
trans-1,2-DICHLOROETHENE	ug/L	100	1	U	1	U	1	U	1	U	1.1		0.94	J	10	U	2	U	1.5	J
METHYL-TERT-BUTYL-ETHER (MTBE)	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,1-DICHLOROETHANE (DCA)	ug/L	1080	29		1	U	1	U	5.7		5.3		1.1		10	U	1.2	J	330	
2,2-DICHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
cis-1,2-DICHLOROETHENE	ug/L	70	1	U	1	U	1	U	44		40		27		10	U	26		250	
2-BUTANONE	ug/L	NL	5	U	5	U	5	U	5	U	5	U	5	U	50	U	10	U	10	UJ
BROMOCHLOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
CHLOROFORM	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,1,1-TRICHLOROETHANE (TCA)	ug/L	200	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	11	
1,1-DICHLOROPROPENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
CARBON TETRACHLORIDE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
BENZENE	ug/L	5.0	12		0.51	J	21		13		12		3		100		8		10	
1,2-DICHLOROETHANE	ug/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
TRICHLOROETHENE (TCE)	ug/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2.6	
1,2-DICHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
DIBROMOMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
BROMODICHLOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
cis-1,3-DICHLOROPROPENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
4-METHYL-2-PENTANONE	ug/L	NL	5	U	5	U	5	U	5	U	5	U	5	U	50	U	10	U	10	U
TOLUENE	ug/L	1000	48		1	U	3		5.9		6.1		1	U	8.1	J	2	U	2	U
trans-1,3-DICHLOROPROPENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,1,2-TRICHLOROETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
TETRACHLOROETHENE	ug/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,3-DICHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
2-HEXANONE	ug/L	NL	5	U	5	U	5	U	5	U	5	U	5	U	50	U	10	U	10	U
DIBROMOCHLOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	C9B		C9C		C10		C11		C11 DUP		C12		C13		C14		C-15	
		SAMPLE NO.	OU041013		OU041014		OU041015		OU041016		OU041017		OU041018		OU041019		OU041020		OU041021	
		SAMPLE DATE	15-Apr-05		14-Apr-05		19-Apr-05		15-Apr-05		15-Apr-05		14-Apr-05		19-Apr-05		19-Apr-05		20-Apr-05	
		SAMPLE PURPOSE	REG		REG		REG		REG		DUP		REG		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-DIBROMOETHANE (EDB)	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
CHLOROBENZENE	ug/L	100	1	U	1	U	1	U	0.76	J	0.66	J	1	U	10	U	2	U	2	U
1,1,1,2-TETRACHLOROETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
ETHYLBENZENE	ug/L	700	65		0.93	J	62		33		34		0.64	J	120		2.2		2	U
m,p-XYLENES	ug/L	NL	140		1.7	J	110		78		80		0.95	J	360		4.7		4	U
o-XYLENE	ug/L	NL	43		0.72	J	6.5		43		42		1.1		62		1.5	J	2	U
STYRENE	ug/L	100	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
BROMOFORM	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
ISOPROPYLBENZENE	ug/L	NL	7.3		1	U	11		3.3		3.7		1	U	9.7	J	1.2	J	2.3	
BROMOBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,1,2,2-TETRACHLOROETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,2,3-TRICHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
n-PROPYLBENZENE	ug/L	NL	10		1	U	13		3.6		3.8		1	U	16		2	U	2	U
2-CHLOROTOLUENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,3,5-TRIMETHYLBENZENE	ug/L	NL	18		1	U	19		7		6.8		1	U	39		2	U	2	U
4-CHLOROTOLUENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
tert-BUTYLBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,2,4-TRIMETHYLBENZENE	ug/L	NL	68		0.73	J	65		36		36		1.1		130		2	J	2	U
sec-BUTYLBENZENE	ug/L	NL	2		1	U	2.9		1	U	1	U	1	U	10	U	2	U	2	U
1,3-DICHLOROBENZENE	ug/L	NL	1.6		1	U	1	U	0.95	J	0.9	J	1	U	10	U	2	U	1.7	J
p-ISOPROPYLTOLUENE	ug/L	NL	2		1	U	1	U	0.76	J	1	U	1	U	10	U	2	U	2	U
1,4-DICHLOROBENZENE	ug/L	75	7.4		1	U	1	U	4.5		4.2		1	U	31		2	U	8.3	
n-BUTYLBENZENE	ug/L	NL	2.8		1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,2-DICHLOROBENZENE	ug/L	600	13		1	U	1	U	8.7		8.5		1	U	59		2	U	13	
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
1,2,4-TRICHLOROBENZENE	ug/L	70	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
HEXACHLOROBUTADIENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
NAPHTHALENE	ug/L	NL	38		1	U	31	J	17		15		1	U	68		2	U	2	U
1,2,3-TRICHLOROBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U	1	U	10	U	2	U	2	U
TOTAL XYLENE	ug/L	10,000	190		2.5		120		120		130		2.1		440		6.2		4	U

Qual - Laboratory qualifier.

Laboratory Qualifiers
J - Estimated result detected above the method detection limit but below the reporting limit.
U - Not detected. The reporting limit is provided.
NL - Not listed.
NS - Not sampled.

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	C-16		C-17		C-18		C-19		C-20		C-21		C-21 DUP		SWS-201		SWS-202	
		SAMPLE NO.	OU041022		OU041023		OU041024		OU041025		OU041026		OU041027		OU041028		OU041041		OU041042	
		SAMPLE DATE	20-Apr-05		20-Apr-05		15-Apr-05		14-Apr-05		20-Apr-05		14-Apr-05		14-Apr-05		14-Apr-05		14-Apr-05	
		SAMPLE PURPOSE	REG		REG		REG		REG		REG		REG		DUP		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
ETHANE	ug/L	NL	60		23		0.5	U	0.5	U	64		0.5	U	0.5	U	NS		NS	
ETHYLENE	ug/L	NL	69		0.78		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	NS		NS	
METHANE	ug/L	NL	5500		1500		0.95		570		1100		0.61	U	1.1	U	NS		NS	
DICHLORODIFLUOROMETHANE	ug/L	NL	10	U	5	U	1	U	1	U	ND		1	U	1	U	1	U	1	U
CHLOROMETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL CHLORIDE (VC)	ug/L	2.0	9.6	J	160		1	U	1	U	1.6		1	U	1	U	1	U	1	U
BROMOMETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	ug/L	NL	4800		770		1	U	1	U	4.2		1	U	1	U	1	U	1	U
TRICHLOROFLUOROMETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHENE (DCE)	ug/L	7	10	U	14		1	U	1	U	2.4		1	U	1	U	1	U	1	U
CARBON DISULFIDE	ug/L	NL	50	U	25	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
ACETONE	ug/L	NL	50	UJ	25	UJ	5	U	5	U	5	UJ	5	J	5	J	5	J	5	J
METHYLENE CHLORIDE	ug/L	5.0	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	ug/L	100	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
METHYL-TERT-BUTYL-ETHER (MTBE)	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE (DCA)	ug/L	1080	37		400		1	U	1	U	27		1	U	1	U	1	U	1	U
2,2-DICHLOROPROPANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-DICHLOROETHENE	ug/L	70	12		190		1	U	1	U	4.4		1	U	1	U	1	U	1	U
2-BUTANONE	ug/L	NL	50	UJ	25	UJ	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U
BROMOCHLOROMETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE (TCA)	ug/L	200	10	U	5	U	1	U	1	U	5.3		1	U	1	U	1	U	1	U
1,1-DICHLOROPROPENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	ug/L	5.0	140		45		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	ug/L	5.0	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROETHENE (TCE)	ug/L	5.0	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
DIBROMOMETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,3-DICHLOROPROPENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
4-METHYL-2-PENTANONE	ug/L	NL	50	U	25	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
TOLUENE	ug/L	1000	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2-TRICHLOROETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHENE	ug/L	5.0	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROPROPANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	ug/L	NL	50	U	25	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
DIBROMOCHLOROMETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	C-16		C-17		C-18		C-19		C-20		C-21		C-21 DUP		SWS-201		SWS-202	
		SAMPLE NO.	OU041022		OU041023		OU041024		OU041025		OU041026		OU041027		OU041028		OU041041		OU041042	
		SAMPLE DATE	20-Apr-05		20-Apr-05		15-Apr-05		14-Apr-05		20-Apr-05		14-Apr-05		14-Apr-05		14-Apr-05		14-Apr-05	
		SAMPLE PURPOSE	REG		REG		REG		REG		REG		REG		DUP		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-DIBROMOETHANE (EDB)	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	ug/L	100	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,1,2-TETRACHLOROETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	ug/L	700	91		5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
m,p-XYLENES	ug/L	NL	16	J	10	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
o-XYLENE	ug/L	NL	8	J	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	ug/L	100	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOFORM	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
ISOPROPYLBENZENE	ug/L	NL	13		5.6		1	U	1	U	1	U	1	U	1	U	1	U	1	U
BROMOBENZENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
n-PROPYLBENZENE	ug/L	NL	16		5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-CHLOROTOLUENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3,5-TRIMETHYLBENZENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
4-CHLOROTOLUENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
tert-BUTYLBENZENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,4-TRIMETHYLBENZENE	ug/L	NL	8.6	J	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
sec-BUTYLBENZENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
p-ISOPROPYLTOLUENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	ug/L	75	36		14		1	U	1	U	1	U	1	U	1	U	1	U	1	U
n-BUTYLBENZENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	ug/L	600	65		35		1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,4-TRICHLOROBENZENE	ug/L	70	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
HEXACHLOROBUTADIENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
NAPHTHALENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	0.84	J	1	U	1	U	1	U
1,2,3-TRICHLOROBENZENE	ug/L	NL	10	U	5	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TOTAL XYLENE	ug/L	10,000	24		10	U	2	U	2	U	ND		2	U	2	U	2	U	2	U

Qual - Laboratory qualifier.

Laboratory Qualifiers
J - Estimated result detected above the method detection limit but below the reporting limit.
U - Not detected. The reporting limit is provided.
NL - Not listed.
NS - Not sampled.

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	SWS-203		SWS-203 DUP		SWS-204		SWS-205		SWS-206	
		SAMPLE NO.	OU041043		OU041044		OU041045		OU041046		OU041047	
		SAMPLE DATE	14-Apr-05		14-Apr-05		14-Apr-05		14-Apr-05		14-Apr-05	
		SAMPLE PURPOSE	REG		DUP		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
ETHANE	ug/L	NL	NS		NS		NS		NS		NS	
ETHYLENE	ug/L	NL	NS		NS		NS		NS		NS	
METHANE	ug/L	NL	NS		NS		NS		NS		NS	
DICHLORODIFLUOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
VINYL CHLORIDE (VC)	ug/L	2.0	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	ug/L	NL	1	U	1	U	1	U	1	U	4	
TRICHLOROFLUOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHENE (DCE)	ug/L	7	1	U	1	U	1	U	1	U	1	U
CARBON DISULFIDE	ug/L	NL	5	U	5	U	5	U	5	U	5	U
ACETONE	ug/L	NL	5	J	5	J	5	J	5	J	5	J
METHYLENE CHLORIDE	ug/L	5.0	1	U	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	ug/L	100	1	U	1	U	1	U	1	U	1	U
METHYL-TERT-BUTYL-ETHER (MTBE)	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE (DCA)	ug/L	1080	1	U	1	U	1	U	1	U	1.2	
2,2-DICHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
cis-1,2-DICHLOROETHENE	ug/L	70	1	U	1	U	1	U	1	U	0.64	J
2-BUTANONE	ug/L	NL	5	U	5	U	5	U	5	U	5	U
BROMOCHLOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE (TCA)	ug/L	200	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROPROPENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
BENZENE	ug/L	5.0	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	ug/L	5.0	1	U	1	U	1	U	1	U	1	U
TRICHLOROETHENE (TCE)	ug/L	5.0	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
DIBROMOMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
BROMODICHLOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
cis-1,3-DICHLOROPROPENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
4-METHYL-2-PENTANONE	ug/L	NL	5	U	5	U	5	U	5	U	5	U
TOLUENE	ug/L	1000	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,1,2-TRICHLOROETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHENE	ug/L	5.0	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	ug/L	NL	5	U	5	U	5	U	5	U	5	U
DIBROMOCHLOROMETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U

Table 3-4

Groundwater and Surface Water Analytical Results for April 2005
Operable Unit 4
Shaw Air Force Base, South Carolina

		LOCATION CODE	SWS-203		SWS-203 DUP		SWS-204		SWS-205		SWS-206	
		SAMPLE NO.	OU041043		OU041044		OU041045		OU041046		OU041047	
		SAMPLE DATE	14-Apr-05		14-Apr-05		14-Apr-05		14-Apr-05		14-Apr-05	
		SAMPLE PURPOSE	REG		DUP		REG		REG		REG	
Parameter	Units	MCL/RGO	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,2-DIBROMOETHANE (EDB)	ug/L	NL	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	ug/L	100	1	U	1	U	1	U	1	U	1	U
1,1,1,2-TETRACHLOROETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	ug/L	700	1	U	1	U	1	U	1	U	1	U
m,p-XYLENES	ug/L	NL	2	U	2	U	2	U	2	U	2	U
o-XYLENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
STYRENE	ug/L	100	1	U	1	U	1	U	1	U	1	U
BROMOFORM	ug/L	NL	1	U	1	U	1	U	1	U	1	U
ISOPROPYLBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
BROMOBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,1,2,2-TETRACHLOROETHANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
n-PROPYLBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
2-CHLOROTOLUENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,3,5-TRIMETHYLBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
4-CHLOROTOLUENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
tert-BUTYLBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,2,4-TRIMETHYLBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
sec-BUTYLBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
p-ISOPROPYLTOLUENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	ug/L	75	1	U	1	U	1	U	1	U	1	U
n-BUTYLBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	ug/L	600	1	U	1	U	1	U	1	U	1	U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,2,4-TRICHLOROBENZENE	ug/L	70	1	U	1	U	1	U	1	U	1	U
HEXACHLOROBUTADIENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
NAPHTHALENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
1,2,3-TRICHLOROBENZENE	ug/L	NL	1	U	1	U	1	U	1	U	1	U
TOTAL XYLENE	ug/L	10,000	2	U	2	U	2	U	2	U	2	U

Qual - Laboratory qualifier.

Laboratory Qualifiers
J - Estimated result detected above the method detection limit but belo
U - Not detected. The reporting limit is provided.
NL - Not listed.
NS - Not sampled.

Table 3-5

Historical Summary of Mann-Kendall Trend Analysis
Operable Unit 4/ SWMU-59
January 2001, 2002, 2003, 2004, April 2005
Shaw Air Force Base, Sumter, South Carolina

	1,1,1-TCA					1,1-DCA					1,1-DCE					cis-1,2-DCE					VC					Benzene				
Site Monitoring Wells																														
	2001	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**	**2001**	**2002**	**2003**	**2004**	**2005**
MW-105	NA	ND	ND	ND	ND	NA	I	--	ND	ND	NA	ND	ND	--	--	NA	--	--	D	D	NA	ND	ND	ND	ND	NA	--	ND	--	--
MW-112	NA	ND	ND	ND	ND	NA	--	--	ND	--	NA	ND	ND	--	--	NA	--	D	D	D	NA	ND	ND	ND	ND	NA	--	ND	--	--
MW-117	D	ND	D	--	--	D	D	D	D	D	D	D	--	--	--	D	D	D	--	--	--	--	--	--	--	NA	D	--	D	D
MW-120	D	--	D	--	--	--	D	D	D	D	D	D	--	--	--	--	--	--	--	--	D	D	D	--	--	NA	D	D	D	D
MW-122A	ND	ND	ND	ND	ND	NA	ND	ND	D	ND	NA	ND	ND	ND	--	NA	I	--	--	--	NA	ND	ND	ND	ND	NA	--	ND	--	--
Upgradient PRB Wells																														
C-2A	i	--	i	i	i	i	--	--	D	D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	--	D	D	D
C-4A	--	D	D	D	D	D	D	D	D	D	--	--	D	D	D	D	D	D	--	--	D	D	D	D	D	NA	D	D	D	D
C-8A	D	D	D	D	D	D	D	D	--	--	D	D	D	D	D	--	D	D	D	D	--	--	--	--	--	NA	--	--	--	--
Downgradient PRB Wells																														
C-3A	ND	ND	ND	ND	--	ND	--	D	D	--	--	--	ND	ND	ND	i	--	D	--	D	i	i	--	--	--	NA	i	--	--	i
C-5A	ND	D	D	D	D	ND	--	--	D	D	D	D	D	D	D	D	D	D	D	D	i	i	--	--	D	NA	--	--	D	D
C-5B	ND	ND	ND	ND	ND	ND	D	D	D	D	D	D	D	D	D	D	D	D	D	D	--	--	D	D	D	NA	D	D	D	D
C-5C	--	--	--	--	--	--	D	D	D	D	--	--	--	--	--	--	D	D	--	D	--	--	D	D	D	NA	D	D	D	D
C-7A	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	NA	D	D	D	D
C-9A	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	--	--	D	NA	D	D	--	--
C-9B	NA	D	D	D	--	NA	D	D	D	D	NA	D	D	D	D	NA	D	D	D	D	NA	D	D	D	D	NA	D	D	--	--
C-9C	NA	ND	ND	ND	ND	NA	D	D	D	D	NA	D	D	D	D	NA	D	D	D	D	NA	D	ND	D	D	NA	D	--	--	--
C-11	ND	ND	--	ND	ND	--	D	D	D	D	D	D	D	D	D	--	D	D	D	D	--	--	D	--	D	NA	D	D	D	D
C-12	ND	ND	ND	ND	ND	--	--	--	D	D	--	--	D	D	D	--	D	D	D	D	--	D	D	D	D	NA	D	D	D	D
C-13	ND	ND	ND	ND	ND	D	D	D	D	--	ND	ND	ND	ND	ND	D	D	D	D	D	ND	ND	ND	ND	ND	NA	--	--	--	--
C-14	ND	ND	ND	ND	ND	--	D	--	--	--	--	D	D	D	D	--	--	D	D	D	--	D	D	D	D	NA	--	--	--	D
Sidegradient PRB Wells																														
C-1	--	--	i	i	i	--	--	i	i	i	--	i	i	i/H	i	--	i	i	i	i	--	--	i	i	i	NA	D	--	--	D
C-10	ND	ND	ND	ND	ND	D	D	--	--	--	ND	ND	ND	ND(d)	ND	D	--	D	D	D	--	--	--	--	D	NA	--	i	i	i
C-1 Area Wells																														
C-15				D	D				--	D				D	D				D	D				--	D	NA			--	D
C-16				ND	ND				D	D				D	D				--	D				--	D	NA			i	i
C-17				ND	ND				--	--				--	--				D	D				D	i	NA			--	--
C-18				ND	ND				D	D				--	D				D	D				--	--	NA			ND	ND
C-19				ND	ND				ND	--				--	ND				ND	ND				ND	ND	NA			ND	ND
C-20				D	D				--	D				I	D				--	--				D	D	NA			--	D
C-21				D	ND				ND	ND				--	--				ND	ND				ND	ND	NA			ND	ND

i= Statistically significant (p≤0.05) increasing concentration trend; bold italics indicate marginal statistical significance.
D= Statistically significant decreasing concentration trend; bold italics indicate marginal statistical significance.
--= No concentration trend is identified.
ND= A majority of the samples are nondetects and no concentration trend can be identified from the data.
NA = Not applicable; not rend analysis was performed at this time.

Note: The first trend asnalysis for 2001 included data from 1998 through January 2001
The 2002 trend analysis included data from 1998 through January 2002
The 2003 trend analysis incl;uded data from 1999 through January 2003
The 2004 trend analysis included data from 1999 through April 2004
The 2005 trend analysis included data from 1999 through April 2005

Table 3-6

Historical Comparison of Target Compounds for Site Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

ANALYTE:	TCA (MCL - 200 µg/L)									
SAMPLE DATE:	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
M1P1	2500	100	86	54	91.6	---	---	---	---	---
MW-1	---	---	260	370	560	---	687	---	---	430
MW-57	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-105	---	1 U	1 U	1 U	1 U	---	1 U	---	---	1 U
MW-106	0.8 J	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-107	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-111	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-112	---	25 U	1 U	1 U	1 U	---	5 U	---	---	1 U
MW-114	---	---	1 U	1 U	1 U	---	1 U	---	---	1 U
MW-115	12	10 U	1 U	1 U	1 U	---	---	---	---	---
MW-115A	---	1 U	1 U	1 U	1 U	---	6.03 J	---	---	1 U
MW-116	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-117	7000	2800	610	510	3110	---	1150	---	---	280
MW-118	---	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-120	8900	3100	1100	6200	5700	---	5990	---	---	---
MW-120A	1500 D	43	2.8	0.43 J	1 U	---	---	---	---	---
MW-120B	10	3.6	1.7	2.3	2.43	---	---	---	---	---
MW-122A	---	---	1 U	10 U	1 U	---	10 U	---	---	1 U
PZ-101	Historical data predates current LTM					1 U	1 U	1 U	1 U	1 U
PZ-103						1 U	1 U	1 U	1 U	1 U

Notes:
All concentrations are in micrograms per liter.
D - The analyte result exceeded the highest concentration of the calibration curve.
J - Result detected above method detection limit but below the reporting limit.
MCL - Maximum Contaminant Level.
--- - Not sampled.
U - Not detected above laboratory method detection limits.
Shading indicates concentrations above the MCL or remedial goal (RG).

Table 3-6

Historical Comparison of Target Compounds for Site Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

ANALYTE:	DCA (RG = 1300 µg/L)									
SAMPLE DATE:	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
M1P1	3400	13	5.5	21	26.7	---	---	---	---	---
MW-1	---	---	38 J	45	119	---	282	---	---	340
MW-57	---	1 U	0.83 J	1 U	1 U	---	---	---	---	---
MW-105	---	1 U	3.9	2	0.31 J	---	1 U	---	---	1 U
MW-106	32 D	1.2	0.64 J	0.17 J	1 U	---	---	---	---	---
MW-107	2.2	0.8 J	1 U	1 U	1 U	---	---	---	---	---
MW-111	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-112	---	25 U	8.6	5.9	1.25	---	4.88 J	---	---	1 U
MW-114	---	---	18 J	8	2.4	---	2.05	---	---	4.2
MW-115	210	310	400 J	13	9.11	---	---	---	---	---
MW-115A	---	1 U	1 U	1 U	1 U	---	304	---	---	1 U
MW-116	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-117	8000	990	830	1100	1360	---	1270	---	---	700
MW-118	---	1 U	1 U	1 U	0.388 J	1.1	0.38 J	0.4 J	0.8 J	1 U
MW-120	17000	5800	2700	3200	3630	---	6190	---	---	---
MW-120A	28 J	0.86 J	1 U	1 U	1 U	---	---	---	---	---
MW-120B	1.4	1 U	1 U	0.48 J	0.64 J	---	---	---	---	---
MW-122A	---	---	0.41 J	10 U	2.16	---	2.69 J	---	---	1.8
PZ-101	Historical data predates current LTM					4.5	2.24	1.61	1.1	1 U
PZ-103						0.736 J	1.3	1 U	1 U	1 U

Notes:
All concentrations are in micrograms per liter.
D - The analyte result exceeded the highest concentration of the calibration curve.
J - Result detected above method detection limit but below the reporting limit.
MCL - Maximum Contaminant Level.
--- - Not sampled.
U - Not detected above laboratory method detection limits.
Shading indicates concentrations above the MCL or remedial goal (RG).

Table 3-6

Historical Comparison of Target Compounds for Site Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

ANALYTE:	DCE (MCL = 7 µg/L)									
SAMPLE DATE:	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
M1P1	300	6.5	11	4.1	3.72	---	---	---	---	---
MW-1	---	---	8.2	9.5	24.1	---	1 U	---	---	28 J
MW-57	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-105	---	1 U	1.5	1 U	1 U	---	1 U	---	---	1 U
MW-106	0.6 J	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-107	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-111	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-112	---	25 U	0.38 J	1 U	1 U	---	5 U	---	---	1 U
MW-114	---	---	0.87 J	0.91 J	1 U	---	1 U	---	---	1 U
MW-115	8.7 J	11	11	2.3	5.35	---	---	---	---	---
MW-115A	4.6	9.6	15	21	21.8	---	12.3	---	---	1 U
MW-116	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-117	6000	140	83	98	228	---	72.2	---	---	37
MW-118	---	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-120	800	290	160 J	340	440	---	500	---	---	---
MW-120A	150	9.1	0.89 J	1 U	1 U	---	---	---	---	---
MW-120B	18	9.7	5.8	4.4	4.32	---	---	---	---	---
MW-122A	---	---	1 U	10 U	0.682 J	---	10 U	---	---	1 U
PZ-101	Historical data predates current LTM					1 U	1 U	1 U	1 U	1 U
PZ-103						1 U	1 U	1 U	1 U	1 U

Notes:
All concentrations are in micrograms per liter.
D - The analyte result exceeded the highest concentration of the calibration curve.
J - Result detected above method detection limit but below the reporting limit.
MCL - Maximum Contaminant Level.
--- - Not sampled.
U - Not detected above laboratory method detection limits.
Shading indicates concentrations above the MCL or remedial goal (RG).

Table 3-6

Historical Comparison of Target Compounds for Site Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

ANALYTE:	VC (MCL = 2 µg/L)									
SAMPLE DATE:	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
M1P1	200 U	8.6	4.7	13	15	---	---	---	---	---
MW-1	---	---	4.9	9.6	48.8	---	43.3	---	---	49 J
MW-57	---	1 U	1 U	2 U	2 U	---	---	---	---	---
MW-105	---	1 U	0.64 J	0.32 J	2 U	---	2 U	---	---	1 U
MW-106	16.2	1 U	1 U	2 U	2 U	---	---	---	---	---
MW-107	---	1 U	1 U	2 U	2 U	---	---	---	---	---
MW-111	---	1 U	1 U	2 U	2 U	---	---	---	---	---
MW-112	---	25 U	1 U	2 U	0.255 J	---	10 U	---	---	1 U
MW-114	---	---	1 U	0.38 J	2 U	---	2 U	---	---	1 U
MW-115	56	180	200 J	98	56.2	---	---	---	---	---
MW-115A	---	1 U	1 U	2 U	2 U	---	173	---	---	1 U
MW-116	---	1 U	1 U	2 U	2 U	---	---	---	---	---
MW-117	220 J	97	220	320	59.8	---	287	---	---	54
MW-118	---	1 U	1 U	2 U	0.546 J	2 U	2 U	2 U	2 U	1 U
MW-120	750 U	36	33 J	20 U	66.3	---	61.3	---	---	---
MW-120A	50 U	1 U	1 U	2 U	2 U	---	---	---	---	---
MW-120B	1 U	1 U	1 U	2 U	2 U	---	---	---	---	---
MW-122A	---	---	---	20 U	0.937 J	---	20 U	---	---	1 U
PZ-101	Historical data predates current LTM					2 U	2 U	0.455 J	0.6 J	1 U
PZ-103						2 U	2 U	2 U	2 U	1 U

Notes:
All concentrations are in micrograms per liter.
D - The analyte result exceeded the highest concentration of the calibration curve.
J - Result detected above method detection limit but below the reporting limit.
MCL - Maximum Contaminant Level.
--- - Not sampled.
U - Not detected above laboratory method detection limits.
Shading indicates concentrations above the MCL or remedial goal (RG).

Table 3-6

Historical Comparison of Target Compounds for Site Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

ANALYTE:	Benzene (MCL = 5 µg/L)									
SAMPLE DATE:	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
M1P1	45 J	0.85 J	0.99 J	0.82 J	9.16	---	---	---	---	---
MW-1	50 U	---	20	9	20.7	---	23.9	---	---	50 U
MW-57	1 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-105	17	11	23	39	4.58	---	2.26	---	---	1 U
MW-106	1.7	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-107	1 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-111	1 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-112	31	110	57	26	23.9	---	39.5	---	---	1.5
MW-114	11	---	7.6	6	1.5	---	2.59	---	---	2.8
MW-115	8.3	48	100 J	82	55.7	---	---	---	---	---
MW-115A	1 U	1 U	1 U	1 U	1 U	---	161	---	---	1 U
MW-116	1 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-117	120 J	22	17	35	30.3	---	23.6	---	---	6.9
MW-118	1 U	1 U	1 U	1 U	0.313 J	1 U	1 U	1 U	1 U	1 U
MW-120	220 J	81	65 J	110	90.9	---	95.5	---	---	---
MW-120A	50 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-120B	1 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-122A	---	---	180	160	107	---	151	---	---	170
PZ-101	Historical data predates current LTM					1 U	1 U	1 U	1 U	1 U
PZ-103						1 U	1 U	1 U	1 U	1 U

Notes:
All concentrations are in micrograms per liter.
D - The analyte result exceeded the highest concentration of the calibration curve.
J - Result detected above method detection limit but below the reporting limit.
MCL - Maximum Contaminant Level.
--- - Not sampled.
U - Not detected above laboratory method detection limits.
Shading indicates concentrations above the MCL or remedial goal (RG).

Table 3-6

Historical Comparison of Target Compounds for Site Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

ANALYTE:	Toluene (MCL = 1000 µg/L)									
SAMPLE DATE:	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
M1P1	330	0.79 J	3.3	1.5	2.1	---	---	---	---	---
MW-1	50 U	---	180	61	27	---	49.9	---	---	50 U
MW-57	1 U	1 U	1.1	1 U	1 U	---	---	---	---	---
MW-105	10 U	0.52 J	15	20	1 U	---	1 U	---	---	1 U
MW-106	2.4	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-107	1 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-111	1 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-112	5.5 J	59	26 J	11	6.52	---	35.8	---	---	3
MW-114	15	---	22	14	0.867 J	---	4.2	---	---	29 J
MW-115	8 J	120	680	440	80.3	---	---	---	---	---
MW-115A	1 U	1 U	1	1 U	1 U	---	618	---	---	1 U
MW-116	1 U	1 U	1 U	1 U	7.32	---	---	---	---	---
MW-117	1500	550	330	290	406	---	497	---	---	180
MW-118	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-120	2500	1200	900	1700	2190	---	1500	---	---	---
MW-120A	50 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-120B	1 U	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-122A	---	---	21	78	13	---	18.9	---	---	8.7
PZ-101	Historical data predates current LTM					1.25	1 U	1 U	1 U	1 U
PZ-103						2.29	1 U	1 U	1 U	1 U

Notes:
All concentrations are in micrograms per liter.
D - The analyte result exceeded the highest concentration of the calibration curve.
J - Result detected above method detection limit but below the reporting limit.
MCL - Maximum Contaminant Level.
NA - Not applicable.
--- - Not sampled.
U - Not detected above laboratory method detection limits.
Shading indicates concentrations above the MCL or remedial goal (RG).

Table 3-6

Historical Comparison of Target Compounds for Site Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

ANALYTE:	TCE (MCL = 5 µg/L)									
SAMPLE DATE:	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
M1P1	65 J	17	15	1.5	8.2	---	---	---	---	---
MW-1	---	---	12	11	12.7	---	27.1	---	---	50 U
MW-57	---	1 U	1 U	1	1 U	---	---	---	---	---
MW-105	---	17	1.4	1 U	1 U	---	1.26	---	---	1 U
MW-106	36 D	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-107	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-111	---	1 U	0.59 J	1 U	1 U	---	---	---	---	---
MW-112	---	25 U	1 U	1 U	1 U	---	5 U	---	---	1 U
MW-114	2.5	---	1.3	1 U	1 U	---	0.478 J	---	---	1 U
MW-115	10 U	1 U	1 U	1 U	0.254 J	---	---	---	---	---
MW-115A	---	4.1	6.9	9.8	11.5	---	1 U	---	---	1 U
MW-116	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-117	400 U	6.4	0.93 J	1.1	1.47	---	0.685 J	---	---	2 U
MW-118	---	1 U	1 U	1 U	1.69	1 U	1 U	1 U	1 U	1 U
MW-120	240 J	75	40 J	230	126	---	24.9	---	---	---
MW-120A	200	8	0.62 J	1 U	1 U	---	---	---	---	---
MW-120B	11	6.1	3.8	2.8	2.98	---	---	---	---	---
MW-122A	---	---	1 U	10 U	0.263 J	---	10 U	---	---	1 U
PZ-101	Historical data predates current LTM					1 U	1 U	1 U	1 U	1 U
PZ-103						1 U	1 U	1 U	1 U	1 U

Notes:
All concentrations are in micrograms per liter.
D - The analyte result exceeded the highest concentration of the calibration curve.
J - Result detected above method detection limit but below the reporting limit.
MCL - Maximum Contaminant Level.
--- - Not sampled.
U - Not detected above laboratory method detection limits.
Shading indicates concentrations above the MCL or remedial goal (RG).

Table 3-6

Historical Comparison of Target Compounds for Site Monitoring Wells
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

ANALYTE:	cis-DCE (MCL = 70 µg/L)									
SAMPLE DATE:	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
M1P1	910	3.3	8.7	8.3	18.3	---	---	---	---	---
MW-1	---	---	55 J	61	121	---	75.5	---	---	66
MW-57	---	1 U	0.78 J	1 U	1 U	---	---	---	---	---
MW-105	---	60	910	190	14	---	4.61	---	---	0.85 J
MW-106	110 D	4.6	0.86 J	0.37 J	1 U	---	---	---	---	---
MW-107	---	3.4	0.79 J	1 U	1 U	---	---	---	---	---
MW-111	---	1 U	1 U	1 U	1 U	---	---	---	---	---
MW-112	21	16 J	11	13	6.83	---	2.93 J	---	---	0.75 J
MW-114	150 D	---	350	350	108	---	109	---	---	280 J
MW-115	45	1 U	140 J	27	61.1	---	---	---	---	---
MW-115A	---	1 U	1 U	1 U	1 U	---	124	---	---	1 U
MW-116	---	670	1 U	1 U	1 U	---	---	---	---	---
MW-117	2000	750	360	410	1170	---	630	---	---	370
MW-118	---	1 U	1 U	0.4 J	12.3	0.252 J	0.449 J	1 U	421J	1 U
MW-120	3000	980	630	1200	1530	---	2420	---	---	---
MW-120A	34 J	0.89 J	1 U	1 U	1 U	---	---	---	---	---
MW-120B	3.5	1 U	1 U	0.31 J	0.542 J	---	---	---	---	---
MW-122A	---	---	730	760	453	---	311	---	---	260
PZ-101	Historical data predates current LTM					0.964 J	0.463 J	1 U	0.3 J	1 U
PZ-103						0.411 J	0.266 J	1 U	1 U	1 U

Notes:
All concentrations are in micrograms per liter.
D - The analyte result exceeded the highest concentration of the calibration curve.
J - Result detected above method detection limit but below the reporting limit.
MCL - Maximum Contaminant Level.
--- - Not sampled.
U - Not detected above laboratory method detection limits.
Shading indicates concentrations above the MCL or remedial goal (RG).

Table 3-7

Historical Comparison of Analytes for PRB and C-1 Area Monitoring Wells
Operable Unit 4
Shaw Air Force Base, South Carolina

Analyte	1,1,1-TCA (MCL = 200 µg/L)									
Well ID	**Jan-99**	**Jan-00**	**Jan-01**	**Jan-02**	**Jan-03**	**Jan-04**	**Apr-04**	**Aug-04**	**Oct-04**	**Apr-05**
Upgradient Monitoring Wells										
C2A	90 J	1000	930	700	1220	NS	700	NS	NS	1 U
C2B	130	400	260	83	410	NS	NS	NS	NS	NS
C4A	9700	9500	5500	5700	4310	NS	2600	NS	NS	2700
C4B	3000	1100	700	200	4.47	NS	NS	NS	NS	NS
C4C	91	34	16	8.9	2.05	NS	NS	NS	NS	NS
C8A	14000 D	3800	1100	990	389	NS	288	NS	NS	150
C8B	4900 D	56	2.3	0.47 J	1 U	NS	NS	NS	NS	NS
Downgradient Monitoring Wells										
C3A	40 U	10 U	1 U	10 U	0.411 J	NS	0.809 J	NS	1 U	20 U
C3B	10 U	5 U	40 U	10 U	1 U	NS	3.71	NS	NS	20 U
C3C	350 D	77	160	68	10.8	NS	3.48	NS	NS	1 U
C5A	83	10 U	1 U	10 U	10 U	NS	50 U	NS	1 U	20 U
C5B	10 U	4 U	1 U	0.44 J	1 U	NS	0.658 J	NS	NS	10 U
C5C	7.5	19	5.5	5.5	7.33	NS	2.91	NS	NS	1 U
C6A	1600	4 U	1 U	1 U	1 U	NS	NS	NS	NS	NS
C7A	2900	4 U	1 U	1 U	1 U	NS	1 U	NS	1 U	1 U
C9A	190 D	1 U	1 U	1 U	1 U	NS	1 U	NS	1 U	1 U
C9B	40 J	1 U	1 U	1 U	1 U	NS	1 U	NS	NS	1 U
C9C	1	1 U	1 U	1 U	1 U	NS	1 U	NS	NS	1 U
C11	Wells were installed January 4, 2000	10 U	1 U	0.34 J	0.287 J	NS	1 U	NS	0.506 J	1 U
C12		2 U	1 U	1 U	1 U	NS	1 U	NS	1 U	1 U
C13		5 U	1 U	1 U	1 U	NS	1 U	NS	1 U	10 U
C14		1 U	1 U	1 U	1 U	NS	5 U	NS	1 U	2 U
C-1 Area Monitoring Wells										
C15	Wells were installed May 2003.					102	81.6	72.3	33.5 J	11
C16						1 U	50 U	5.64	11.3 J	10 U
C17						0.871 J	1.17	1U	2.02	5 U
C18						1 U	1 U	1 U	1 U	1 U
C19						1 U	1 U	1 U	1 U	1 U
C20	Wells were installed November 2003					132	107	105	41.6	5.3
C21						1 U	1 U	1U	1U	1 U
Sidegradient Monitoring Wells										
C1	1.3	1 U	2.5	130	19.9	125	72	38.1	33 J	26
C10	0	1 U	1 U	1 U	1 U	NS	1 U	NS	1 U	1 U

U - Not detected above laboratory method detection limits.
J - Estimated results detected between the method detection limit and the reporting limit.
D - Result obtained from a dilution, which brought the analyte into the instrument calibration range.
E & I - The analyte result exceeded the highest concentration of the calibration curve.
MCL - Maximum contaminant level.
µg/L - Micrograms per liter.
PRB - Permeable reactive barrier.
RG - Remedial goal.
NS - Not sampled.
Shading indicates the compound exceeds the remedial goal or MCL.
Well ID is in bold print for wells downgradient of the PRB.

Table 3-7

Historical Comparison of Analytes for PRB and C-1 Area Monitoring Wells
Operable Unit 4
Shaw Air Force Base, South Carolina

Analyte	1,1-DCA (RG = 1,300 µg/L)									
Well ID	**Jan-99**	**Jan-00**	**Jan-01**	**Jan-02**	**Jan-03**	**Jan-04**	**Apr-04**	**Aug-04**	**Oct-04**	**Apr-05**
	Upgradient Monitoring Wells									
C2A	2100	9600	5800	4800	2590	NS	3550	NS	NS	270
C2B	1500	3500	3300	1700	1240	NS	NS	NS	NS	NS
C4A	7900	1700	1500	1500	2090	NS	6170	NS	NS	7000
C4B	8300	1300	520	220	70.7	NS	NS	NS	NS	NS
C4C	230	76	61	39	8.41	NS	NS	NS	NS	NS
C8A	5300	5800	2800	2200	4650	NS	4330	NS	NS	3600
C8B	2100 D	240	18	2.8	0.584 J	NS	NS	NS	NS	NS
	Downgradient Monitoring Wells									
C3A	180	450	640	25	10.5	NS	440	NS	92	220
C3B	190	250	520	42	7.17	NS	263	NS	NS	160
C3C	210 D	41	77	110	9.18	NS	16.1	NS	NS	33
C5A	3400 D	360	340	1300	147	NS	74.3	NS	37.5	41
C5B	6700 D	160	80	57	54.6	NS	116	NS	NS	130
C5C	58 D	300	34	32	37.6	NS	23.9	NS	NS	2.8
C6A	6100	1100	460	300	7.87	NS	NS	NS	NS	NS
C7A	6500 D	1100	110	60	3.79	NS	56.2	NS	6.01	8.3
C9A	2300 D	360	47	6.4	3.17	NS	187	NS	29.5 J	30
C9B	3000 D	370	44	3.4	3.84	NS	68.1	NS	NS	29
C9C	200 D	15	0.9 J	0.29 J	0.319 J	NS	0.745 J	NS	NS	1 U
C11	Wells were installed January 4, 2000	36	14	9.5	9.47	NS	14.2	NS	11.6	5.7
C12		28	2	2.6	0.578 J	NS	0.775 J	NS	1.94	1.1
C13		89	0.85 J	0.29 J	0.23 J	NS	0.168 J	NS	1 U	10 U
C14		2.7	2.7	1.1	5.24	NS	1.67 J	NS	2.08	1.2 J
	C-1 Area Monitoring Wells									
C15	Wells were installed May 2003.					1060	835	628	400	330
C16						53	42.4 J	101	93.5	37
C17						235	194	136	388	400
C18						1.68	0.242 J	1 U	1 U	1 U
C19						0.25 J	1 U	0.131 J	0.25 J	1 U
C20	Wells were installed November 2003					503	258	311	132 J	27
C21						1 U	1 U	1 U	1 U	1 U
	Sidegradient Monitoring Wells									
C1	25	46	55	450	466	772	504	173	198	260
C10	53 D	3.7	0.53 J	3.4	5.63	NS	3.02	NS	2.59J	1 U

U - Not detected above laboratory method detection limits.
J - Estimated results detected between the method detection limit and the reporting limit.
D - Result obtained from a dilution, which brought the analyte into the instrument calibration range.
E & I - The analyte result exceeded the highest concentration of the calibration curve.
MCL - Maximum contaminant level.
µg/L - Micrograms per liter.
PRB - Permeable reactive barrier.
RG - Remedial goal.
NS - Not sampled.
Shading indicates the compound exceeds the remedial goal or MCL.
Well ID is in bold print for wells downgradient of the PRB.

Table 3-7

Historical Comparison of Analytes for PRB and C-1 Area Monitoring Wells
Operable Unit 4
Shaw Air Force Base, South Carolina

Analyte	1,1-DCE (MCL = 7 µg/L)									
Well ID	**Jan-99**	**Jan-00**	**Jan-01**	**Jan-02**	**Jan-03**	**Jan-04**	**Apr-04**	**Aug-04**	**Oct-04**	**Apr-05**
	Upgradient Monitoring Wells									
C2A	100	450 J	460	390	338	NS	173	NS	NS	13
C2B	80 J	180	220	140	119	NS	NS	NS	NS	NS
C4A	770	610	660	380	383	NS	504	NS	NS	860
C4B	460	180	140	46	5.09	NS	NS	NS	NS	NS
C4C	15	8.5	7.2	4.3	1.3	NS	NS	NS	NS	NS
C8A	690	180	58 J	42	41.6	NS	95.2	NS	NS	63
C8B	270	19	1.3	1 U	1 U	NS	NS	NS	NS	NS
	Downgradient Monitoring Wells									
C3A	40 U	11	14	10 U	1 U	NS	440	NS	92	30
C3B	10 U	4.3 J	40 U	10 U	1 U	NS	263	NS	NS	20 U
C3C	66 D	28	54	40	6.68	NS	6.73	NS	NS	5.3
C5A	160	160	40 J	5.1 J	10 U	NS	50 U	NS	37.5	20 U
C5B	160	93	37 J	0.68 J	0.594 J	NS	3.94	NS	NS	5.1 J
C5C	4.6	1	3.6	3.2	4.99	NS	2.95	NS	NS	1 U
C6A	310 J	120	40 J	5.1	1 U	NS	NS	NS	NS	NS
C7A	340	99	15	0.72 J	1 U	NS	1 U	NS	6.01	1 U
C9A	91 J/D	3.3	0.26 J	1 U	1 U	NS	1 U	NS	1 U	1 U
C9B	140	45	1	1 U	1 U	NS	1 U	NS	NS	1 U
C9C	3	1 U	1 U	1 U	1 U	NS	1 U	NS	NS	1 U
C11	Wells were installed January 4, 2000	71	27	19	10.7	NS	15.9	NS	12.5	8
C12		42	32	23	1.38	NS	2.37	NS	5.16	2.9
C13		5 U	1 U	1 U	1 U	NS	1 U	NS	1 U	10 U
C14		29	21	13	12.4	NS	7.53	NS	11.5	5.6
	C-1 Area Monitoring Wells									
C15	Wells were installed May 2003.					75.5	65.5	45.5	35J	20
C16						6.69	50 U	11.2	10.4J	10 U
C17						4.73	3.54	2.68	9.43	14
C18						1 U	1 U	1 U	1 U	1 U
C19						1 U	1 U	1 U	1 U	1 U
C20	Wells were installed November 2003					42.8	30	29	12.1	2.4
C21						1 U	1 U	1 U	1 U	1 U
	Sidegradient Monitoring Wells									
C1	0	1 U	1.9	37	29.3	58.7	36.2	23.6	23 J	19
C10	1	1 U	1 U	1 U	1 U	NS	1 U	NS	1 U	1 U

U - Not detected above laboratory method detection limits.
J - Estimated results detected between the method detection limit and the reporting limit.
D - Result obtained from a dilution, which brought the analyte into the instrument calibration range.
E & I - The analyte result exceeded the highest concentration of the calibration curve.
MCL - Maximum contaminant level.
µg/L - Micrograms per liter.
PRB - Permeable reactive barrier.
RG - Remedial goal.
NS - Not sampled.
Shading indicates the compound exceeds the remedial goal or MCL.
Well ID is in bold print for wells downgradient of the PRB.

Table 3-7

Historical Comparison of Analytes for PRB and C-1 Area Monitoring Wells
Operable Unit 4
Shaw Air Force Base, South Carolina

Analyte	VC (MCL = 2 µg/L)									
Well ID	**Jan-99**	**Jan-00**	**Jan-01**	**Jan-02**	**Jan-03**	**Jan-04**	**Apr-04**	**Aug-04**	**Oct-04**	**Apr-05**
	Upgradient Monitoring Wells									
C2A	86 J	110	94 J	200	77.4	NS	187	NS	NS	6.4
C2B	60 J	75	140 J	280	142	NS	NS	NS	NS	NS
C4A	400 U	75	66 J	8.6 J	49.9	NS	147	NS	NS	52
C4B	400 U	100	58	19	8.89	NS	NS	NS	NS	NS
C4C	0	1 U	1 U	2 U	2 U	NS	NS	NS	NS	NS
C8A	500 U	5.3	15	13	50.6	NS	26.2	NS	NS	16
C8B	89	11	2.8	13	1.71 J	NS	NS	NS	NS	NS
	Downgradient Monitoring Wells									
C3A	85	180	520	130	7.48	NS	439	NS	121	340
C3B	23	110	220	59	2 U	NS	168	NS	NS	120
C3C	3.6	1 U	1.4	13	0.666 J	NS	14.7	NS	NS	25
C5A	10 U	250	290	360	64.2	NS	48.2 J	NS	19.2	79
C5B	100	99 J	160	38	31.2	NS	187	NS	NS	140
C5C	1 U	5	1 U	2 U	2 U	NS	0.634 J	NS	NS	1 U
C6A	400 U	120	93	170	1.81 J	NS	NS	NS	NS	NS
C7A	130 J	88	54	46	2.96	NS	17.4	NS	1.37 J	1 U
C9A	41 J/D	4.7	8.6	4.7	23.5	NS	11.2	NS	2.49	3
C9B	95	11	1 U	3.1	11	NS	0.338 J	NS	NS	1 U
C9C	4.3	1 U	1 U	2 U	2 U	NS	2 U	NS	NS	1 U
C11	Wells were installed January 4, 2000	28	7	6.2	4.73	NS	11.1	NS	7.54	2.8
C12		30	13	8.6	0.428 J	NS	2.4	NS	4.69	1.5
C13		6.9	1 U	2 U	2 U	NS	2 U	NS	2 U	10 U
C14		12	13	12	5.16	NS	5.98 J	NS	7.77	2.3
	C-1 Area Monitoring Wells									
C15	Wells were installed May 2003.					413	285	262	208	180
C16						191	68.7	107	53.6	9.6 J
C17						76.1	63.1	143	129	160
C18						2 U	2 U	2U	2U	1 U
C19						2 U	2 U	2U	2U	1 U
C20	Wells were installed November 2003					167	86.7	48.9	13.6	1.6
C21						2 U	2 U	2U	2U	1 U
	Sidegradient Monitoring Wells									
C1	9.5	34	22	210	176	279	123	75.5	173	90
C10	1.3	1.7	8.6	40	0.381 J	NS	3.5	NS	9.11	1 U

U - Not detected above laboratory method detection limits.
J - Estimated results detected between the method detection limit and the reporting limit.
D - Result obtained from a dilution, which brought the analyte into the instrument calibration range.
E & I - The analyte result exceeded the highest concentration of the calibration curve.
MCL - Maximum contaminant level.
µg/L - Micrograms per liter.
PRB - Permeable reactive barrier.
RG - Remedial goal.
NS - Not sampled.
Shading indicates the compound exceeds the remedial goal or MCL.
Well ID is in bold print for wells downgradient of the PRB.

Table 3-7

Historical Comparison of Analytes for PRB and C-1 Area Monitoring Wells
Operable Unit 4
Shaw Air Force Base, South Carolina

Analyte	Benzene (MCL = 5 µg/L)									
Well ID	**Jan-99**	**Jan-00**	**Jan-01**	**Jan-02**	**Jan-03**	**Jan-04**	**Apr-04**	**Aug-04**	**Oct-04**	**Apr-05**
Updgradient Monitoring Wells										
C2A	53 J	110	88 J	61	30.6	NS	56.2 J	NS	NS	2.4
C2B	35 J	42	47 J	37	18.2	NS	NS	NS	NS	NS
C4A	140 J	51	42 J	32	38.5	NS	47.7	NS	NS	44
C4B	130 J	27	9.8	6.9	3.67	NS	NS	NS	NS	NS
C4C	10 U	1 U	1 U	1 U	1 U	NS	NS	NS	NS	NS
C8A	500 U	29	39 J	23	45.3	NS	24.8	NS	NS	17
C8B	37 J	4.1	4.4	4.1	1.9	NS	NS	NS	NS	NS
Downgradient Monitoring Wells										
C3A	12 J	54	120 J	79	33.2	NS	172 J	NS	108 J	160
C3B	4.3 J	40	120	85	33.4	NS	164 J	NS	NS	160
C3C	1.1	1 U	1.4	3.3	0.665 J	NS	3.1	NS	NS	4
C5A	56	47	55 J	63	34.1	NS	40 J	NS	40.4 J	46
C5B	110	39	22	18	24.9	NS	26.3	NS	NS	22
C5C	1 U	4.4	0.95 J	0.53 J	0.515 J	NS	0.303 J	NS	NS	1 U
C6A	92 J	50	17	21	9.86	NS	NS	NS	NS	NS
C7A	97 J	49	14	19	9.94	NS	15.9	NS	18.2	10
C9A	45 JD	22	24	17	26.7	NS	33.7	NS	24.4 J	17
C9B	69	13	16	11	27.5	NS	15.8	NS	NS	12
C9C	1.7	0.69 J	0.59 J	0.39 J	1.73	NS	0.274 J	NS	NS	0.51 J
C11	Wells were installed January 4, 2000	31	19	14	9.43	NS	22.3	NS	19.8	13
C12		29	22	19	1.14	NS	2.91	NS	5.03 U	3
C13		42	100 J	85	32.3	NS	118	NS	130	100
C14		1.6	11	5.4	2.84	NS	6.29	NS	13.6 U	8
C-1 Area Monitoring Wells										
C15	Wells were installed May 2003					58.6	56.3	30.6	25.6 J	10
C16						106	93.1	106	117 J	140
C17						53.1	45.2	53.6	47.5	45
C18						1 U	1 U	1 U	1 U	1 U
C19						1 U	1 U	1 U	1 U	1 U
C20	Wells were installed November 2003					32.7	14.9	6.75	1.77 J	1 U
C21						1 U	1 U	1 U	1 U	1 U
Sidegradient Monitoring Wells										
C1	2	1.9	1.9	31.0	58.4	49.2	27	12.5	33 J	13
C10	19	8.3	9.2	34	35.1	NS	31.4	NS	32.3 J	21

U - Not detected above laboratory method detection limits.
J - Estimated results detected between the method detection limit and the reporting limit.
D - Result obtained from a dilution, which brought the analyte into the instrument calibration range.
E & I - The analyte result exceeded the highest concentration of the calibration curve.
MCL - Maximum contaminant level.
ug/L - Microgra
PRB - Permea
RG - Remedial goal.
NS - Not sampled.
Shading indicates the compound exceeds the remedial goal or MCL.
Well ID is in bold print for wells downgradient of the PRB.

Table 3-7

Historical Comparison of Analytes for PRB and C-1 Area Monitoring Wells
Operable Unit 4
Shaw Air Force Base, South Carolina

Analyte	Toluene (MCL = 1000 µg/L)									
Well ID	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
	Upgradient Monitoring Wells									
C2A	100	1100	1000	1400	375	NS	467	NS	NS	19
C2B	100	440	350	440	130	NS	NS	NS	NS	NS
C4A	1600	790	600	620	608	NS	1 U	NS	NS	1400
C4B	1200	260	78	26	4.37	NS	NS	NS	NS	NS
C4C	10 U	1 U	1 U	1 U	1 U	NS	NS	NS	NS	NS
C8A	1900	700	300	280	680 D	NS	544	NS	NS	450
C8B	720	31	1.1	0.55 J	1.1	NS	NS	NS	NS	NS
	Downgradient Monitoring Wells									
C3A	37 J	75	780	910	275 D	NS	1050	NS	712	980
C3B	10 U	70	860	820	132	NS	649	NS	NS	730
C3C	1 U	1 U	1 U	0.58 J	1 U	NS	2.35	NS	NS	7.1
C5A	410 D	570	690	1200	414	NS	257	NS	252	250
C5B	630 D	420	250	200	248 D	NS	348	NS	NS	260
C5C	1 U	4	0.96 J	0.79 J	0.493 J	NS	0.506 J	NS	NS	1 U
C6A	350 J	610	350	240	26.9	NS	NS	NS	NS	NS
C7A	360	340	220	200	14.2	NS	26.5	NS	7.16	4.6
C9A	620	140	45	33	50.5	NS	93.6	NS	57.2 J	22
C9B	680 U	170	58	16	70.7	NS	135	NS	NS	48
C9C	1 U	9.8	3.4	1.5	3.87	NS	1.26	NS	NS	1 U
C11	Wells were installed January 4, 2000	65	27	6.8	3.38	NS	15.7	NS	9.75	5.9
C12		2.1	5.2	4.7	1 U	NS	1.27	NS	1.23	1 U
C13		76	410	6.5	7.87	NS	11.2	NS	14.6	8.1 J
C14		1 U	2.2	0.67 J	1 U	NS	5 U	NS	1.65	2 U
	C-1 Area Monitoring Wells									
C15	Wells were installed May 2003					2.01	1.66	0.864J	0.967 J	2 U
C16						11.8	50 U	4.82	4.09	10 U
C17						1.26	1.1	1.34	1.13	5 U
C18						1 U	1 U	1 U	1 U	1 U
C19						1 U	1 U	1 U	1 U	1 U
C20	Wells were installed November 2003					1.09	0.82 J	1 U	1 U	1 U
C21						1 U	1 U	1 U	1 U	1 U
	Sidegradient Monitoring Wells									
C1	1 U	1 U	1 U	0.77 J	2.17	1	0.811 J	1 U	0.6	1 U
C10	8.2	5.4	8.6	42	16.2	NS	55.6	NS	12.9	3

U - Not detected above laboratory method detection limits.
J - Estimated results detected between the method detection limit and the reporting limit.
D - Result obtained from a dilution, which brought the analyte into the instrument calibration range.
E & I - The analyte result exceeded the highest concentration of the calibration curve.
MCL - Maximum contaminant level.
ug/L - Microgr
PRB - Permeable reactive barrier.
RG - Remedial goal.
NS - Not sampled.
Shading indicates the compound exceeds the remedial goal or MCL.
Well ID is in bold print for wells downgradient of the PRB.

Table 3-7

Historical Comparison of Analytes for PRB and C-1 Area Monitoring Wells
Operable Unit 4
Shaw Air Force Base, South Carolina

Analyte	TCE (MCL = 5 µg/L)									
Well ID	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05
	Upgradient Monitoring Wells									
C2A	100 U	10 U	2	10 U	10 U	NS	0.277 J	NS	NS	1 U
C2B	100 U	10 U	6.5	0.33 J	1 U	NS	NS	NS	NS	NS
C4A	400 U	110	16 J	3.8 J	10 U	NS	1 U	NS	NS	20 U
C4B	400 U	7.6	1.2	1 U	1 U	NS	NS	NS	NS	NS
C4C	1 U	1.2	0.71 J	0.43 J	1 U	NS	NS	NS	NS	NS
C8A	500 U	1.5 J	0.49 J	10 U	1.84	NS	0.478 J	NS	NS	10 U
C8B	50 U	1 U	1 U	1 U	1 U	NS	NS	NS	NS	NS
	Downgradient Monitoring Wells									
C3A	40 U	10 U	1 U	10 U	1 U	NS	1 U	NS	1 U	20 U
C3B	10 U	5 U	40 U	10 U	1 U	NS	1 U	NS	NS	20 U
C3C	30 D	13	30	20	4.14	NS	1.82	NS	NS	1 U
C5A	10 U	10 U	1 U	10 U	10 U	NS	50 U	NS	1 U	20 U
C5B	10 U	4 U	1 U	1 U	1 U	NS	1 U	NS	NS	10 U
C5C	1.1	1	0.39 J	1 U	0.536 J	NS	0.548 J	NS	NS	1 U
C6A	400 U	4 U	1 U	1 U	1 U	NS	NS	NS	NS	NS
C7A	250 U	4 U	1 U	1 U	1 U	NS	1 U	NS	1 U	1 U
C9A	1.6	1 U	1 U	1 U	1 U	NS	1 U	NS	1 U	1 U
C9B	50 U	1 U	1 U	1 U	1 U	NS	1 U	NS	NS	1 U
C9C	1 U	1 U	1 U	1 U	1 U	NS	1 U	NS	NS	1 U
C11	Wells were installed January 4, 2000	10 U	0.27 J	1 U	1 U	NS	1 U	NS	0.361 J	1 U
C12		2 U	0.26 J	1 U	1 U	NS	1 U	NS	1 U	1 U
C13		5 U	1 U	1 U	1 U	NS	1 U	NS	1 U	10 U
C14		1 U	1 U	1 U	1 U	NS	5 U	NS	1 U	2 U
	C-1 Area Monitoring Wells									
C15	Wells were installed May 2003					9.32	6.82	4.05	4.35	2.6
C16						0.424 J	50 U	0.412 J	0.631 J	10 U
C17						0.256 J	0.565 J	1 U	0.539 J	5 U
C18						1 U	1 U	1 U	1 U	1 U
C19						1 U	1 U	1 U	1 U	1 U
C20	Wells were installed November 2003					1.65	1.45	1.03	0.527 J	1 U
C21						1 U	1 U	1 U	1 U	1 U
	Sidegradient Monitoring Wells									
C1	1 U	1 U	1.2	10.0	3.48	8.97	7.23	7.36	3.93	4.5
C10	1 U	1 U	1 U	1 U	1 U	NS	1 U	NS	1 U	1 U

U - Not detected above laboratory method detection limits.
J - Estimated results detected between the method detection limit and the reporting limit.
D - Result obtained from a dilution, which brought the analyte into the instrument calibration range.
E & I - The analyte result exceeded the highest concentration of the calibration curve.
MCL - Maximum contaminant level.
ug/L - Microgr
PRB - Permeable reactive barrier.
RG - Remedial goal.
NS - Not sampled.
Shading indicates the compound exceeds the remedial goal or MCL.
Well ID is in bold print for wells downgradient of the PRB.

Table 3-7

Historical Comparison of Analytes for PRB and C-1 Area Monitoring Wells
Operable Unit 4
Shaw Air Force Base, South Carolina

Analyte	cis-DCE (MCL = 70 µg/L)									
Well ID	**Jan-99**	**Jan-00**	**Jan-01**	**Jan-02**	**Jan-03**	**Jan-04**	**Apr-04**	**Aug-04**	**Oct-04**	**Apr-05**
Upgradient Monitoring Wells										
C2A	470	1800	1500	1500	1070	NS	891	NS	NS	58
C2B	350	860	730	560	482 D	NS	NS	NS	NS	NS
C4A	3100	2000	1700	1900	1940 D	NS	2630	NS	NS	3100
C4B	1800	470	270	140	39	NS	NS	NS	NS	NS
C4C	39	13	13	7.9	2.06	NS	NS	NS	NS	NS
C8A	3000	830	400	360	951 D	NS	415	NS	NS	270
C8B	960	56	19	35	77.1	NS	NS	NS	NS	NS
Downgradient Monitoring Wells										
C3A	60	190	430 J	39	3.05	NS	418	NS	1 U	250
C3B	21	86	240	51	0.448 J	NS	101	NS	NS	48
C3C	49 D	10	18	37	2.26	NS	24.5	NS	NS	40
C5A	810 D	1100	410	650	76.3	NS	69.7	NS	1 U	65
C5B	1100 D	610	350	34	33.1	NS	128	NS	NS	110
C5C	11	43	6.9	5.7	7.69	NS	4.69	NS	NS	0.67 J
C6A	1300	940	500	190	0.504 J	NS	NS	NS	NS	NS
C7A	1600	940	260	61	1.31	NS	15	NS	1 U	1 U
C9A	670 D	58	12	1.1	0.387 J	NS	1.34	NS	1 U	1 U
C9B	960	170	56	0.99 J	0.353 J	NS	1.01	NS	NS	1 U
C9C	34 D	7.6	1.6	0.27 J	0.364 J	NS	1 U	NS	NS	1 U
C11	Wells were installed January 4, 2000	470	220	160	71.5	NS	78	NS	75.8	44
C12		320	350	260	18.1	NS	25.7	NS	52	27
C13		3.4 J	1 U	0.42 J	1 U	NS	0.331 J	NS	1 U	10 U
C14		140	91	64	72.2	NS	42.4	NS	67.3	26
C-1 Area Monitoring Wells										
C15	Wells were installed May 2003					494	397	32.3	238	250
C16						122	61.3	88.7	53.9	12
C17						68.1	51.3	76	122	190
C18						0.366 J	1 U	1 U	1 U	1 U
C19						1 U	1 U	1 U	1 U	1 U
C20	Wells were installed November 2003					189	106	69	19.8	4.4
C21						1 U	1 U	1 U	1 U	1 U
Sidegradient Monitoring Wells										
C1	2.9	7.4	15	200	195 D	299	169	91.6	172	95
C10	92 D	3.1	18	12	1 U	NS	14.7	NS	7.5	1 U

U - Not detected above laboratory method detection limits.
J - Estimated results detected between the method detection limit and the reporting limit.
D - Result obtained from a dilution, which brought the analyte into the instrument calibration range.
E & I - The analyte result exceeded the highest concentration of the calibration curve.
MCL - Maximum contaminant level.
ug/L - Microgr
PRB - Permea
RG - Remedial goal.
NS - Not sampled.
Shading indicates the compound exceeds the remedial goal or MCL.
Well ID is in bold print for wells downgradient of the PRB.

Table 3-8

Historical Surface Water Analytical Results
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

(Page 1 of 2)

			SWS-201						SWS-202										SWS-20
			Oct-03		Apr-04		Apr-05		Oct-03		Apr-04		Apr-05		Jul-02		Oct-02		Jan-03		
Parameter	Units	MCL	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Re
1,1,1-TRICHLOROETHANE	µg/L	200	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,1-DICHLOROETHANE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,1-DICHLOROETHENE	µg/L	7	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
VINYL CHLORIDE	µg/L	2.0	2	U	2	U	1	U	2	U	2	U	1	U	2	U	2	U	2	U	
1,2,3-TRICHLOROBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,2,4-TRICHLOROBENZENE	µg/L	70	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,2,4-TRIMETHYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,2-DICHLOROBENZENE	µg/L	75	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,2-DICHLOROETHANE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,3,5-TRIMETHYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,3-DICHLOROBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
1,4-DICHLOROBENZENE	µg/L	600	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
2-BUTANONE	µg/L	---	10	U	10	U	5	U	10	U	10	U	5	U	10	U	10	U	10	U	
ACETONE	µg/L	---	10	U	10	U	5	UJ	10	U	10	U	5	UJ	10	U	17		10	U	
CARBON DISULFIDE	µg/L	---	1	U	1	U	5	U	1	U	1	U	5	U	1	U	1	U	1	U	
CHLOROBENZENE	µg/L	100	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
CHLOROETHANE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
CHLOROFORM	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
CHLOROMETHANE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
cis-1,2-DICHLOROETHENE	µg/L	70	1	U	0.579	J	1	U	1	U	0.592	J	1	U	1	U	1	U	1	U	
trans-1,2-DICHLOROETHENE	µg/L	100	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
TRICHLOROETHENE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
TETRACHLOROETHENE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
BENZENE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
TOLUENE	µg/L	1000	1	U	0.339	J	1	U	1	U	0.369	J	1	U	1	U	1	U	1	U	
ETHYLBENZENE	µg/L	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
m,p-XYLENES	µg/L	---	1	U	1	U	2	U	1	U	1	U	2	U	1	U	1	U	1	U	
o-XYLENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
TOTAL XYLENE	µg/L	10,000					2	U					2	U							
ISOPROPYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
METHYLENE CHLORIDE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
n-BUTYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
n-PROPYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
NAPHTHALENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
p-ISOPROPYLTOLUENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
sec-BUTYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
STYRENE	µg/L	100	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	
tert-BUTYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	

J - Result detected above method detection limit but below the reporting limit.
U - Not detected above laboratory method detection limits.
NA - Not applicable.
TOT - Total.

Table 3-8

Historical Surface Water Analytical Results
Operable Unit 4
Shaw Air Force Base, Sumter, South Carolina

			SWS-204					SWS-205								SWS-206							
			Oct-03		Apr-04		Apr-05		Aug-03		Oct-03		Jan-04		Apr-04		Apr-05		Aug-03		Oct-03		Jan-04		Apr-04		Apr-05	
Parameter	Units	MCL	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qu
1,1,1-TRICHLOROETHANE	µg/L	200	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	µg/L	---	1	U	1	U	1	U	0.972	J	1	U	15.8		1	U	1	U	0.972	J	1	U	15.7		1.99		1.2	
1,1-DICHLOROETHENE	µg/L	7	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
VINYL CHLORIDE	µg/L	2.0	2	U	2	U	1	U	2	U	0.314	J	0.274	J	2	U	1	U	2	U	2	U	0.319	J	2	U	1	U
1,2,3-TRICHLOROBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,4-TRICHLOROBENZENE	µg/L	70	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2,4-TRIMETHYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	µg/L	75	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3,5-TRIMETHYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	µg/L	600	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
2-BUTANONE	µg/L	---	10	U	10	U	5	U	10	U	10	U	10	U	10	U	5	U	10	U	10	U	10	U	10	U	5	U
ACETONE	µg/L	---	10	U	10	U	5	UJ	10	U	10	U	10	U	10	U	5	UJ	10	U	10	U	10	U	10	U	5	UJ
CARBON DISULFIDE	µg/L	---	1	U	1	U	5	U	1	U	1	U	1	U	1	U	5	U	1	U	1	U	1	U	1	U	5	U
CHLOROBENZENE	µg/L	100	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	µg/L	---	1	U	1	U	1	U	3.95		1	U	6.91		1.02		1	U	2.93		1	U	6.65		2.38		4	
CHLOROFORM	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
cis-1,2-DICHLOROETHENE	µg/L	70	1	U	0.557	J	1	U	0.777	J	0.311	J	1.6		0.579	J	1	U	0.496	J	1.3		1.58		0.753	J	0.64	J
trans-1,2-DICHLOROETHENE	µg/L	100	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TRICHLOROETHENE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHENE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
BENZENE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	0.144	J	1	U	1	U	1	U	0.144	J	0.158	J	1	U	1	U
TOLUENE	µg/L	1000	1	U	1	U	1	U	1	U	1	U	0.439	J	1	U	1	U	1	U	1	U	0.437	J	1	U	1	U
ETHYLBENZENE	µg/L	700	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
m,p-XYLENES	µg/L	---	1	U	1	U	2	U	1	U	1	U	1	U	1	U	2	U	1	U	1	U	1	U	1	U	2	U
o-XYLENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
TOTAL XYLENE	µg/L	10,000					2	U									2	U									2	U
ISOPROPYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
METHYLENE CHLORIDE	µg/L	5.0	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
n-BUTYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
n-PROPYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
NAPHTHALENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
p-ISOPROPYLTOLUENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
sec-BUTYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
STYRENE	µg/L	100	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
tert-BUTYLBENZENE	µg/L	---	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U

J - Result detected above method detection limit but bel
U - Not detected above laboratory method detection limi
NA - Not applicable.
TOT - Total.

Table 4-1

Natural Attenuation Rates and Half-lives
April 2005
Operable Unit 4/SWMU 59
Shaw Air Force Base, Sumter, South Carolina

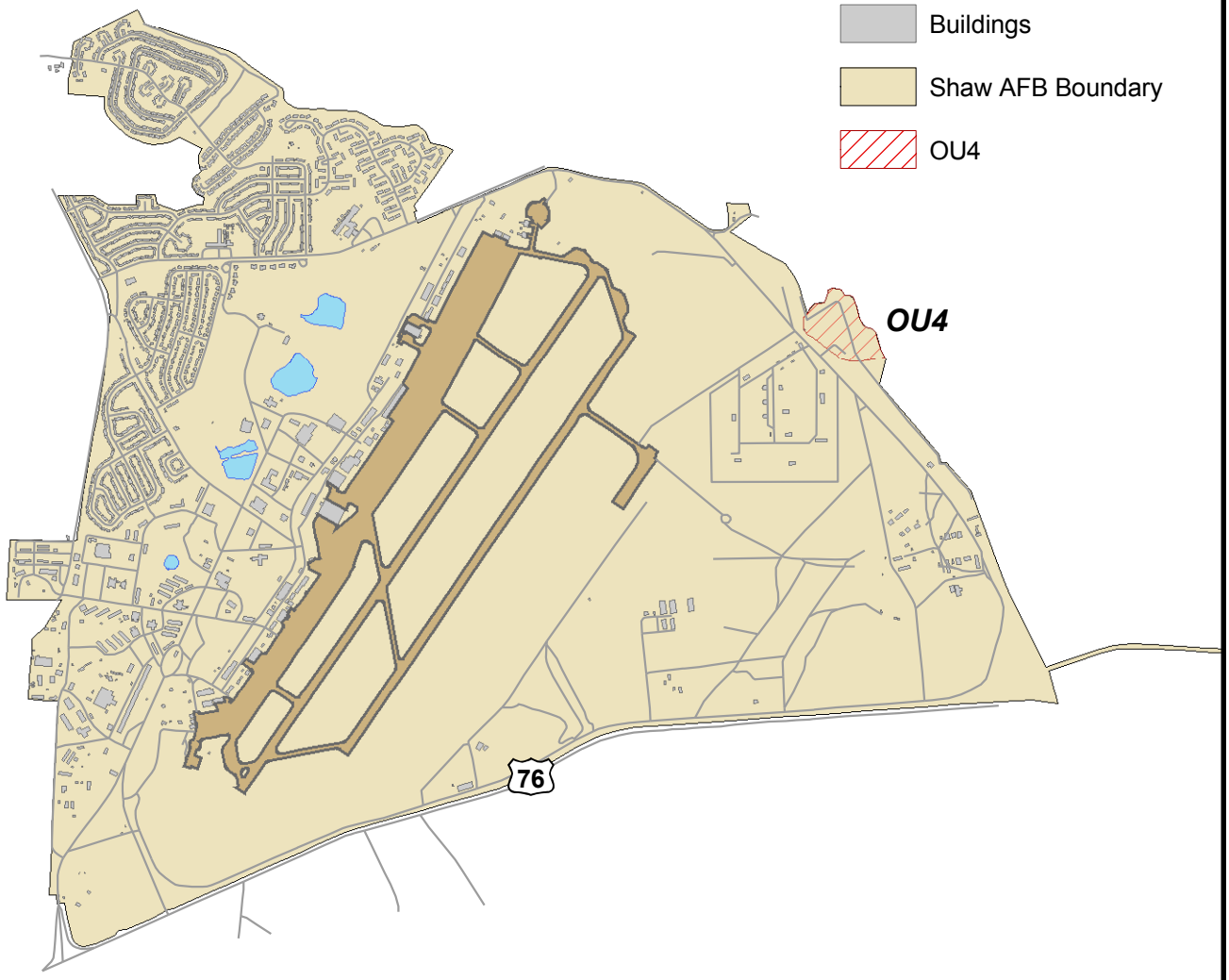
North Transect - C9A, C11, C12, SW202			
1,1-DCA	Natural Attenuation Rate	17.20	per year
	Natural Attenuation Half-life	0.04	year
	Biodegradation Rate	0.38	per year
	Biodegradation Half-life	1.83	year
CA	Natural Attenuation Rate	18.95	per year
	Natural Attenuation Half-life	0.04	year
	Biodegradation Rate	0.49	per year
	Biodegradation Half-life	1.42	year
VC	Natural Attenuation Rate	8.85	per year
	Natural Attenuation Half-life	0.08	year
	Biodegradation Rate	2.214	per year
	Biodegradation Half-life	0.3	year
Middle Transect - C5A, C6A, C7A, SWS203			
1,1-DCA	Natural Attenuation Rate	11.3	per year
	Natural Attenuation Half-life	0.06	year
	Biodegradation Rate	0.24	per year
	Biodegradation Half-life	2.84	year
CA	Natural Attenuation Rate	25.17	per year
	Natural Attenuation Half-life	0.03	year
	Biodegradation Rate	0.73	per year
	Biodegradation Half-life	0.96	year
cis-1,2-DCE	Natural Attenuation Rate	15.0	per year
	Natural Attenuation Half-life	0.05	year
	Biodegradation Rate	0.28	per year
	Biodegradation Half-life	2.49	year
VC	Natural Attenuation Rate	15.8	per year
	Natural Attenuation Half-life	0.04	year
	Biodegradation Rate	4.65	per year
	Biodegradation Half-life	0.15	year
Benzene	Natural Attenuation Rate	17.64	per year
	Natural Attenuation Half-life	0.04	year
	Biodegradation Rate	0.20	per year
	Biodegradation Half-life	3.5	year

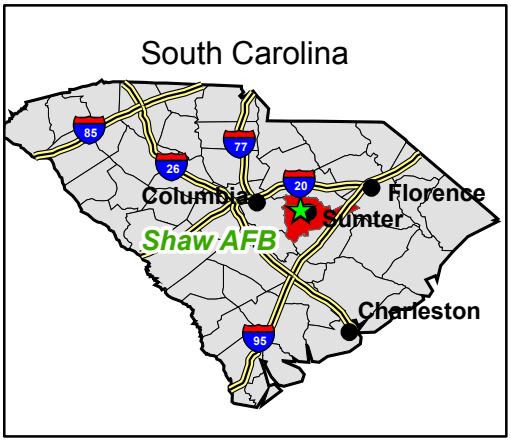
Table 4-1

Natural Attenuation Rates and Half-lives
January 2001
Operable Unit 4/SWMU 59
Shaw Air Force Base, Sumter, South Carolina

South Transect - MW115, C13, C14, SWS204			
CA	Natural Attenuation Rate	6.28	per year
	Natural Attenuation Half-life	0.11	year
	Biodegradation Rate	0.15	per year
	Biodegradation Half-life	4.5	year
Benzene	Natural Attenuation Rate	13.92	per year
	Natural Attenuation Half-life	0.05	year
	Biodegradation Rate	0.16	per year
	Biodegradation Half-life	4.3	year

FIGURES





N

Shaw Air Force Base
Sumter, South Carolina

Figure 1-1

Site Location Map

OFFICE	DRAWN BY	
PITT	K. Masterson	July 2005

Map Document: (C:\shaw_afb\GIS\workspace\mxd\Report_july_2005\ou4\Site Location Fig1-1_ou4.mxd)
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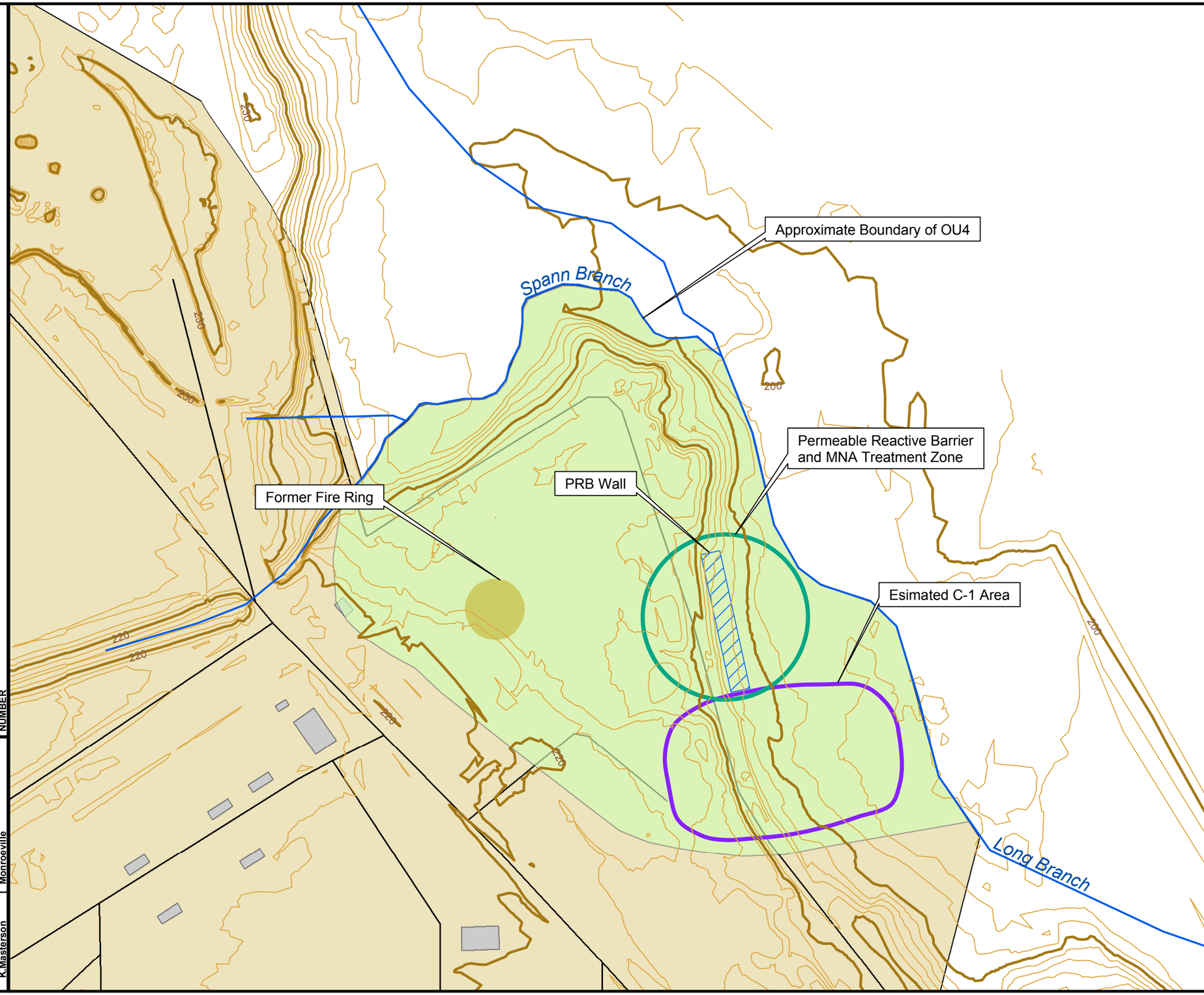


Legend

- Shaw AFB Boundary
- Buildings
- Pond
- Approximate OU4 Boundary
- Former Fire Ring
- Approximate Area of Permeable Reactive Barrier
- PRB Wall
- Estimated C-1 Area
- Roads - on base
- Roads - off base
- Stream
- Ground Contour (10 ft)
- Ground Contour (2 ft)

Notes:

200 100 0 200 Feet

N

REFERENCE/PROJECTION: NAD83 State Plane

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 1-2

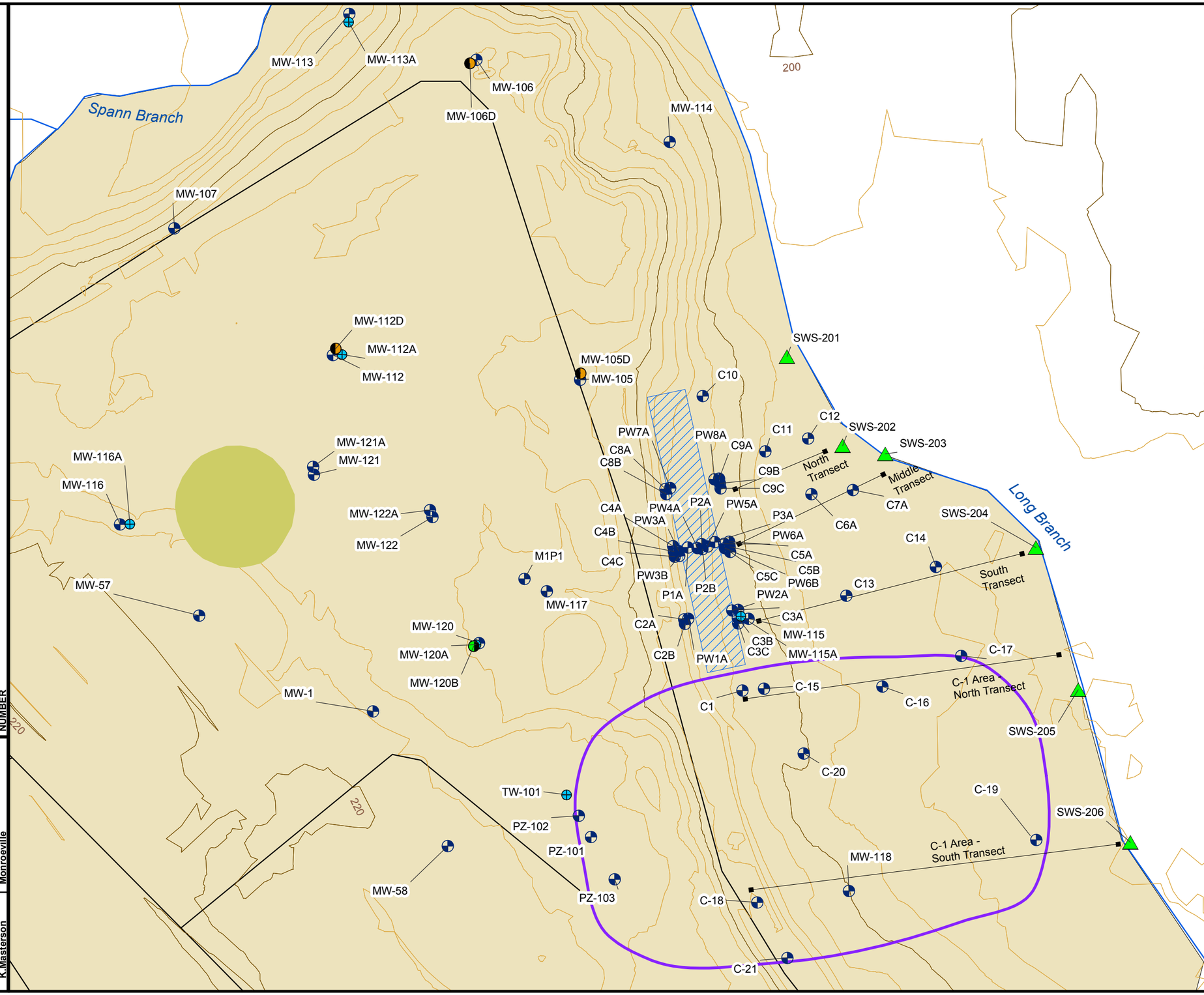
Site Map
OU4 / SWMU 59

Map Document: (C:\shaw_afb\GISworkspace\mxd\Report_july_2005\ou4\ou4_gw_cnt_wt2_u_0405.mxd)
7/14/2005 -- 11:27:26 AM

DRAWING NUMBER

DRAWN BY Monroeville

OFFICE K.Masterson



Legend

- Shaw AFB Boundary
- Estimated C-1 Area
- PRB Wall
- Former Fire Ring
- Roads - on base
- Ground Contour (10 ft)
- Ground Contour (2 ft)
- Stream
- Transect
- Lower Black Creek Monitoring Well
- Upper Black Creek Monitoring Well
- Perched Monitoring well
- Lang Syne Monitoring Well
- Surface Water Location

Notes:

Transects are used to calculate biordegredation rates.

75 37.5 0 75 Feet

N

REFERENCE/PROJECTION: NAD83 State Plane

Shaw®

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 1-3

Operable Unit 4 (OU4)
Monitoring Well Locations
OU4/SWMU-59

DRAWING NUMBER

DRAWN BY Monroeville

OFFICE K.Masterson

Map Document: (C:\shaw_afb\GIS\workspace\mxd\Report_july_2005\ou4\ou4_well_location_map.mxd)
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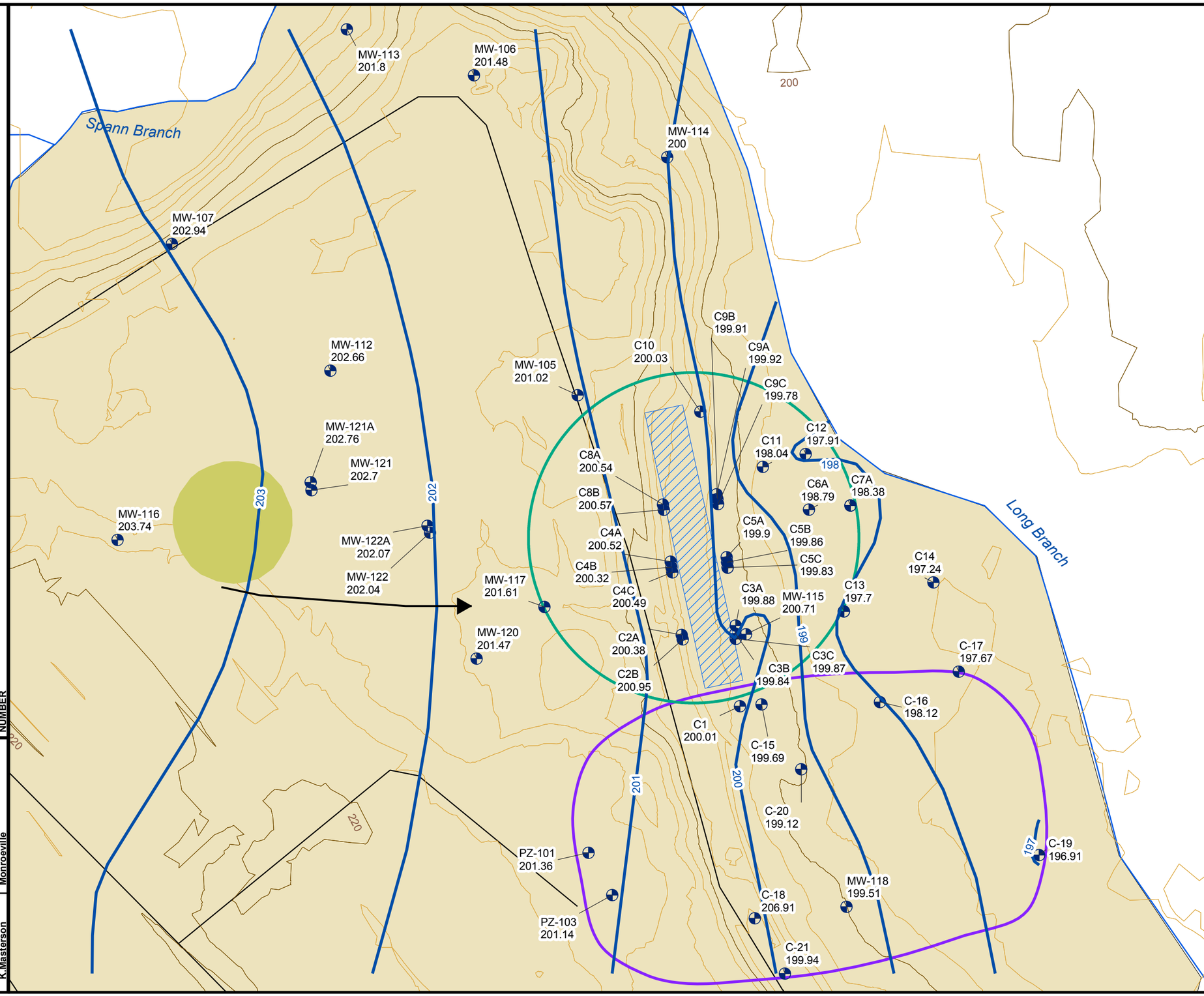

Legend

- Shaw AFB Boundary
- Buildings
- Pond
- PRB Wall
- Approximate Area of Permeable Reactive Barrier
- Former_Fire_Ring
- Estimated C-1 Area
- Ground Contour (10 ft)
- Ground Contour (2 ft)
- Stream
- Roads - on base
- Roads - off base
- WL_2005_ALL Events
- Groundwater Elevation Contour
- Groundwate Flow Direction

Notes:

Well M1P1 was not used for contouring since this well is screened over a 25 foot interval.

Well C-18 was not used in construction contours, value appears to be an anomalous.

100 50 0 100 Feet

N

REFERENCE/PROJECTION: NAD83 State Plane

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 3-1

Operable Unit 4 (OU4)
Groundwater Elevations from
March 2005 Monitoring
OU4 / SWMU 59

Map Document: (C:\shaw_afb\GISworkspace\mxd\Report_july_2005\ou4\ou4_gw_cnt_wt2_u_0305.mxd)
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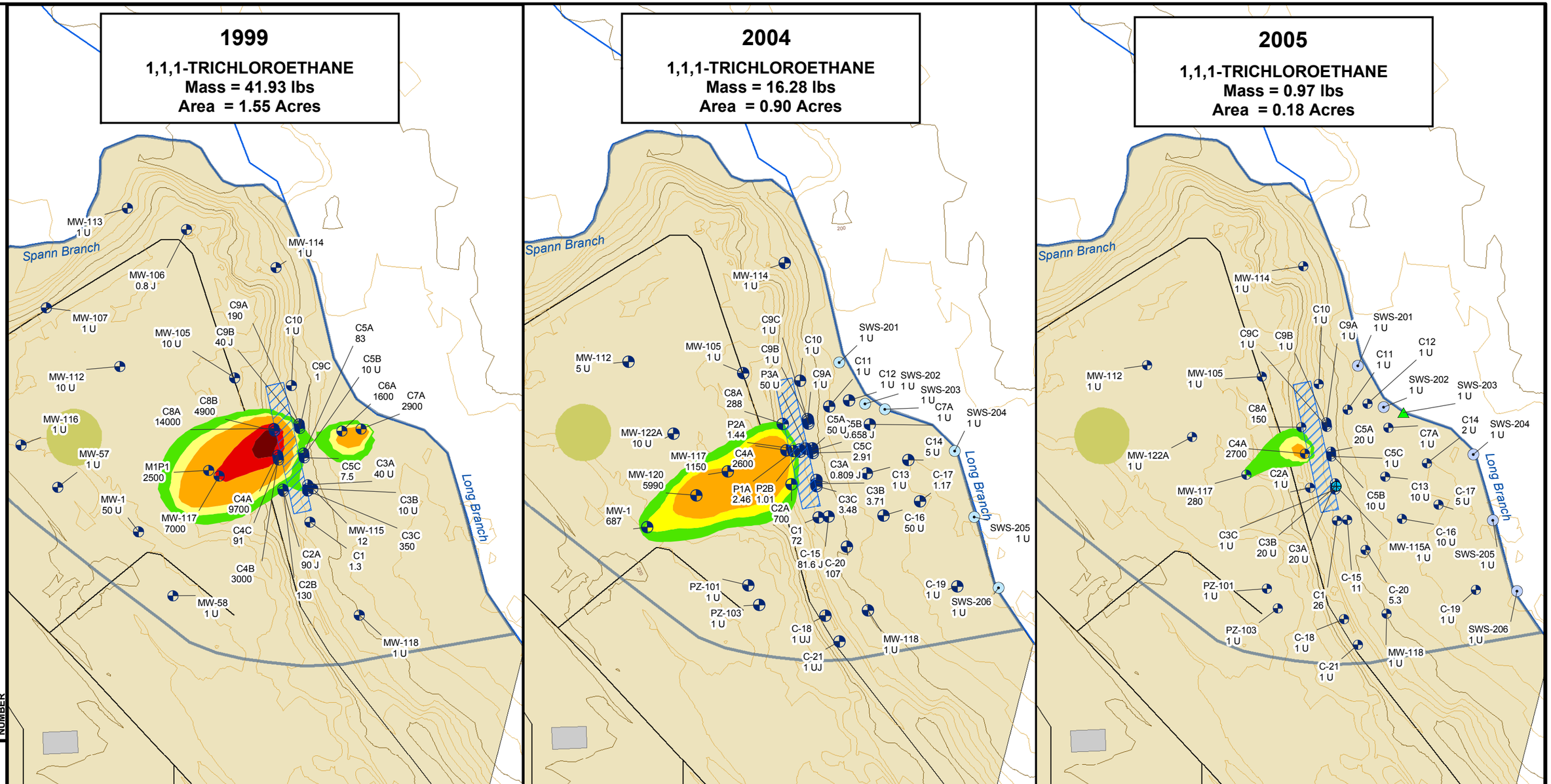
DRAWING NUMBER

DRAWN BY Monroeville

OFFICE K.Masterson



Legend

- Shaw AFB Boundary
- Buildings
- Pond
- Former Fire Ring
- PRB Wall
- Ground Contour (10 ft)
- Ground Contour (2 ft)
- Stream
- Roads - on base
- Roads - off base

1,1,1-Trichloroethane (µg/L)

- 200 - 500
- 500 - 1000
- 1000 - 5000
- 5000 - 10000
- >10000

N

0 100 200 400 Feet

REFERENCE/PROJECTION: NAD83 State Plane

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 4-1

Operable Unit 4 (OU4)
1,1,1-Trichloroethane Metrics

DRAWING NUMBER

Map Document: (C:\shaw_afb\GISworkspace\mxd\Report_july_2005\ou4\ou4_metrics_2005_TCA.mxd)
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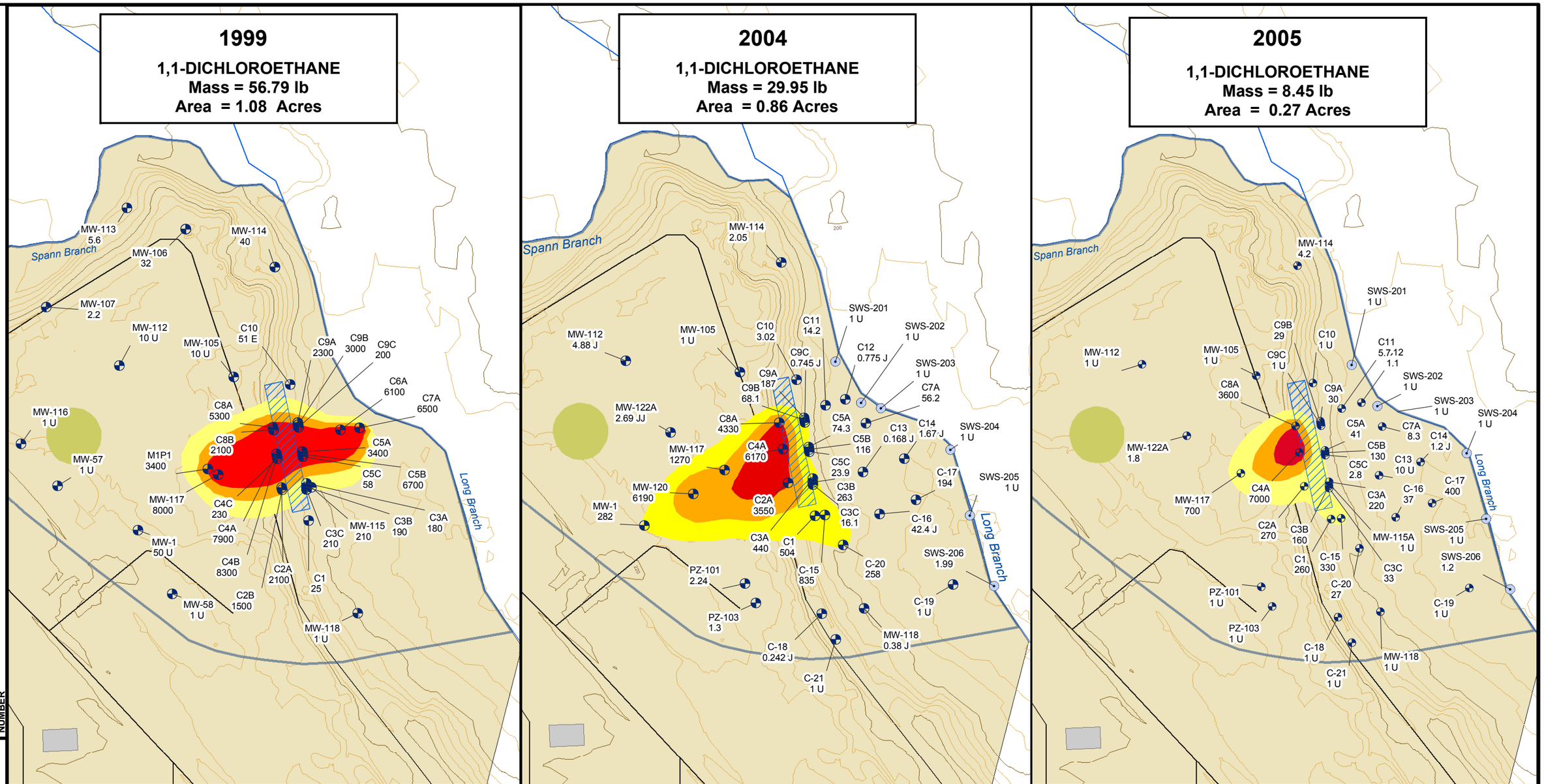
OFFICE K.Masterson



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DRAWING NUMBER

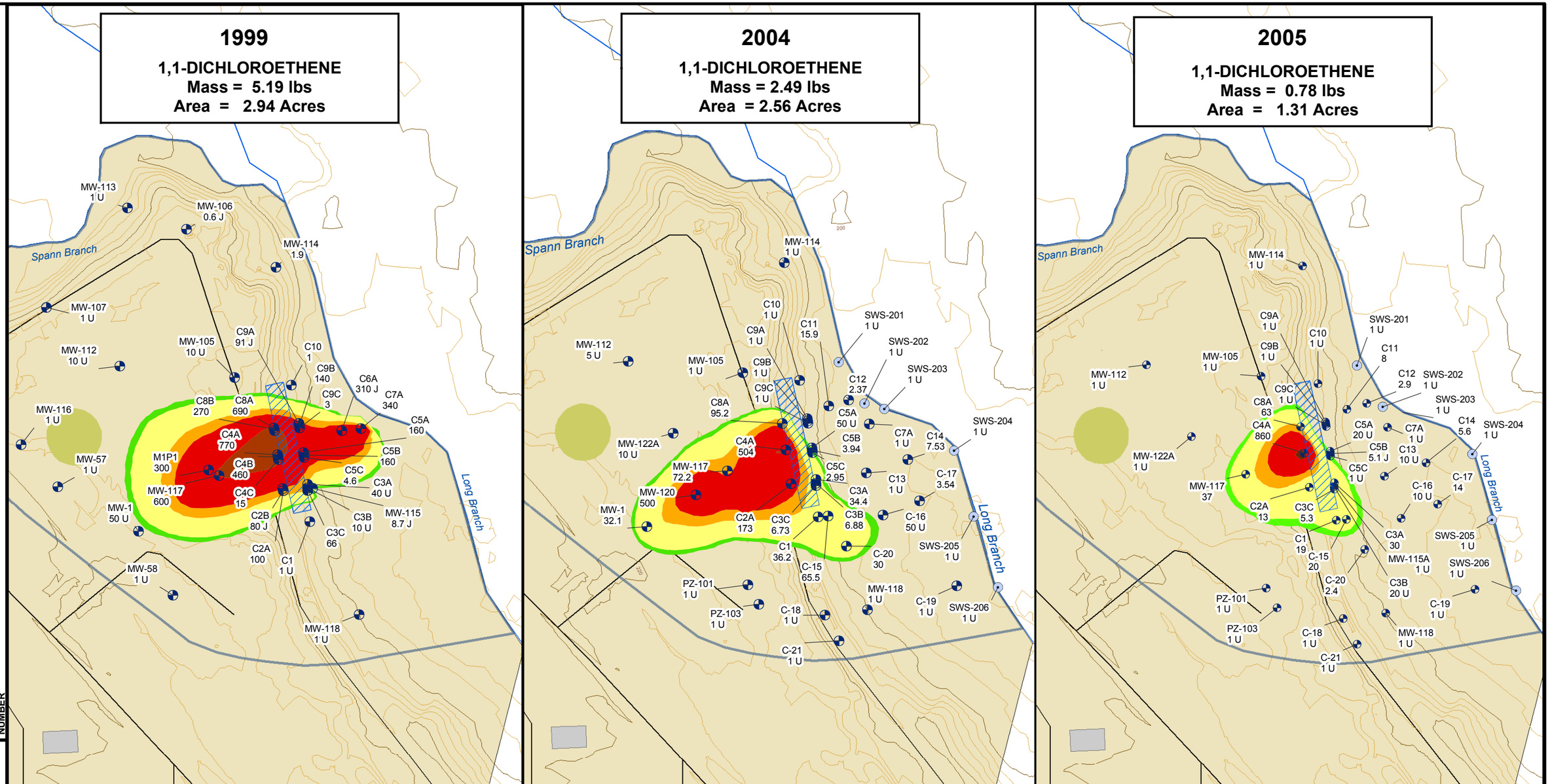
DRAWN BY Monroeville

OFFICE K.Masterson

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 4-2

Operable Unit 4 (OU4)
1,1-Dichloroethane Metrics



Legend

- Shaw AFB Boundary
- Buildings
- Pond
- Former Fire Ring
- PRB Wall
- Roads - on base
- Roads - off base
- Stream
- Ground Contour (10 ft)
- Ground Contour (2 ft)

1,1-Dichloroethene (µg/L)

- 7 - 10
- 10 - 50
- 50 - 100
- 100 - 500
- > 500

N

0 100 200 400 Feet

REFERENCE/PROJECTION: NAD83 State Plane

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 4-3

Operable Unit 4 (OU4)
1,1-Dichloroethene Metrics

DRAWING NUMBER

Map Document: (C:\shaw_afb\GIS\workspace\mxd\Report_july_2005\ou4\ou4_metrics_2005_11DCE.mxd)
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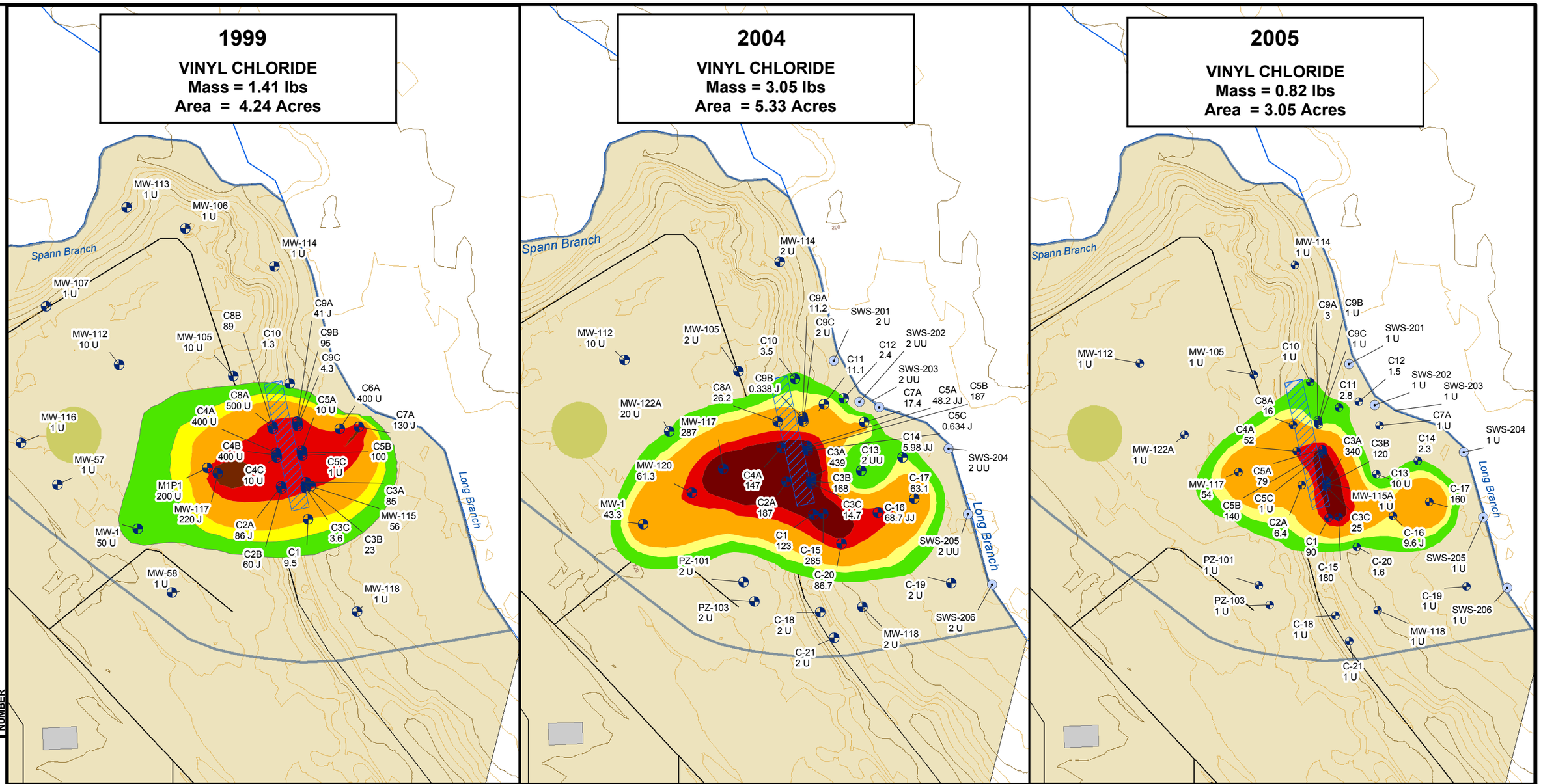
OFFICE K.Masterson



Legend

- Shaw AFB Boundary
- Buildings
- Pond
- Former Fire Ring
- PRB Wall
- Roads - on base
- Roads - off base
- Stream
- Ground Contour (10 ft)
- Ground Contour (2 ft)

Vinyl Chloride (µg/L)

- 2 - 5
- 5 - 10
- 10 - 50
- 50 - 100
- >100

N

0 100 200 400 Feet

REFERENCE/PROJECTION: NAD83 State Plane

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 4-4

Operable Unit 4 (OU4)
Vinyl Chloride Metrics

DRAWING NUMBER

DRAWN BY Monroeville

OFFICE K.Masterson

Map Document: (C:\shaw_afb\GIS\workspace\mxd\Report_july_2005\ou4\ou4_metrics_2005_VC.mxd)
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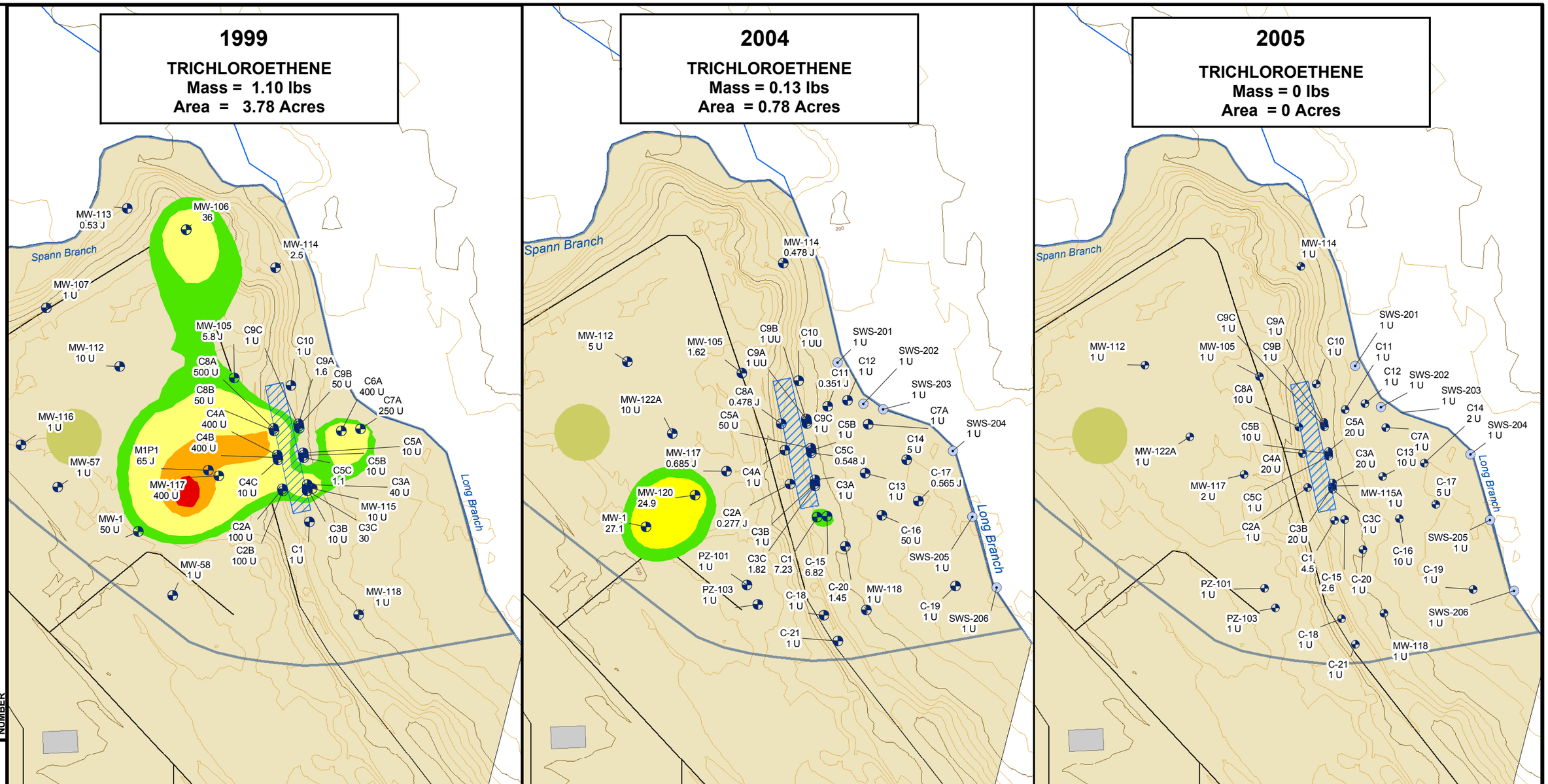

Legend

- Shaw AFB Boundary
- Buildings
- Pond
- Former Fire Ring
- PRB Wall
- Roads - on base
- Roads - off base
- Stream
- Ground Contour (10 ft)
- Ground Contour (2 ft)

Trichloroethane (µg/L)

- 5 - 10
- 10 - 50
- 50 - 100
- >100

N

0 100 200 400 Feet

REFERENCE/PROJECTION: NAD83 State Plane

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 4-5

Operable Unit 4 (OU4)
Trichloroethene Metrics

DRAWING NUMBER

DRAWN BY Monroeville

OFFICE K.Masterson

Map Document: (C:\shaw_afb\GIS\workspace\mxd\Report_july_2005\ou4\ou4_metrics_2005_tce.mxd)
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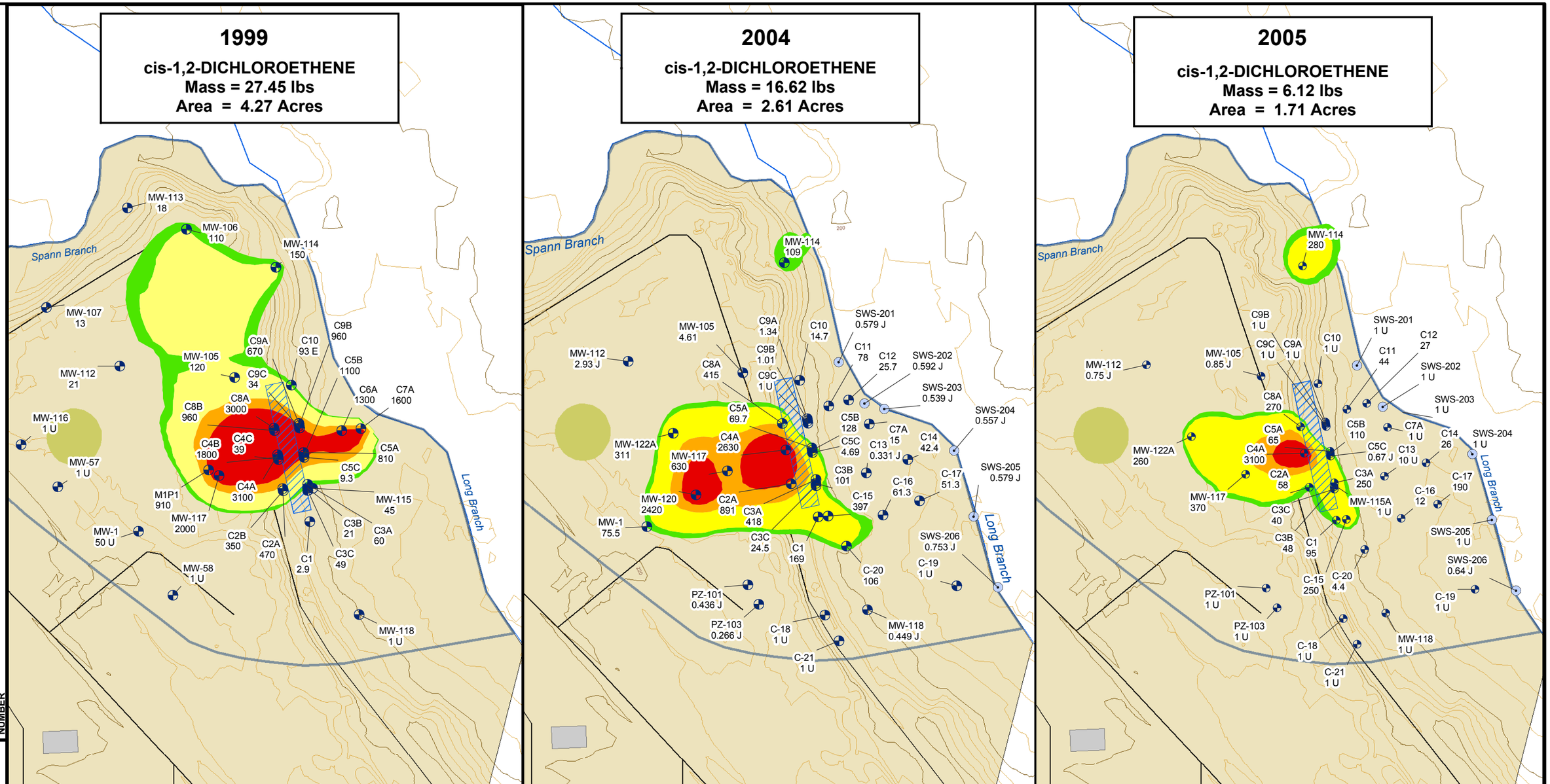

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DRAWING NUMBER

DRAWN BY Monroeville

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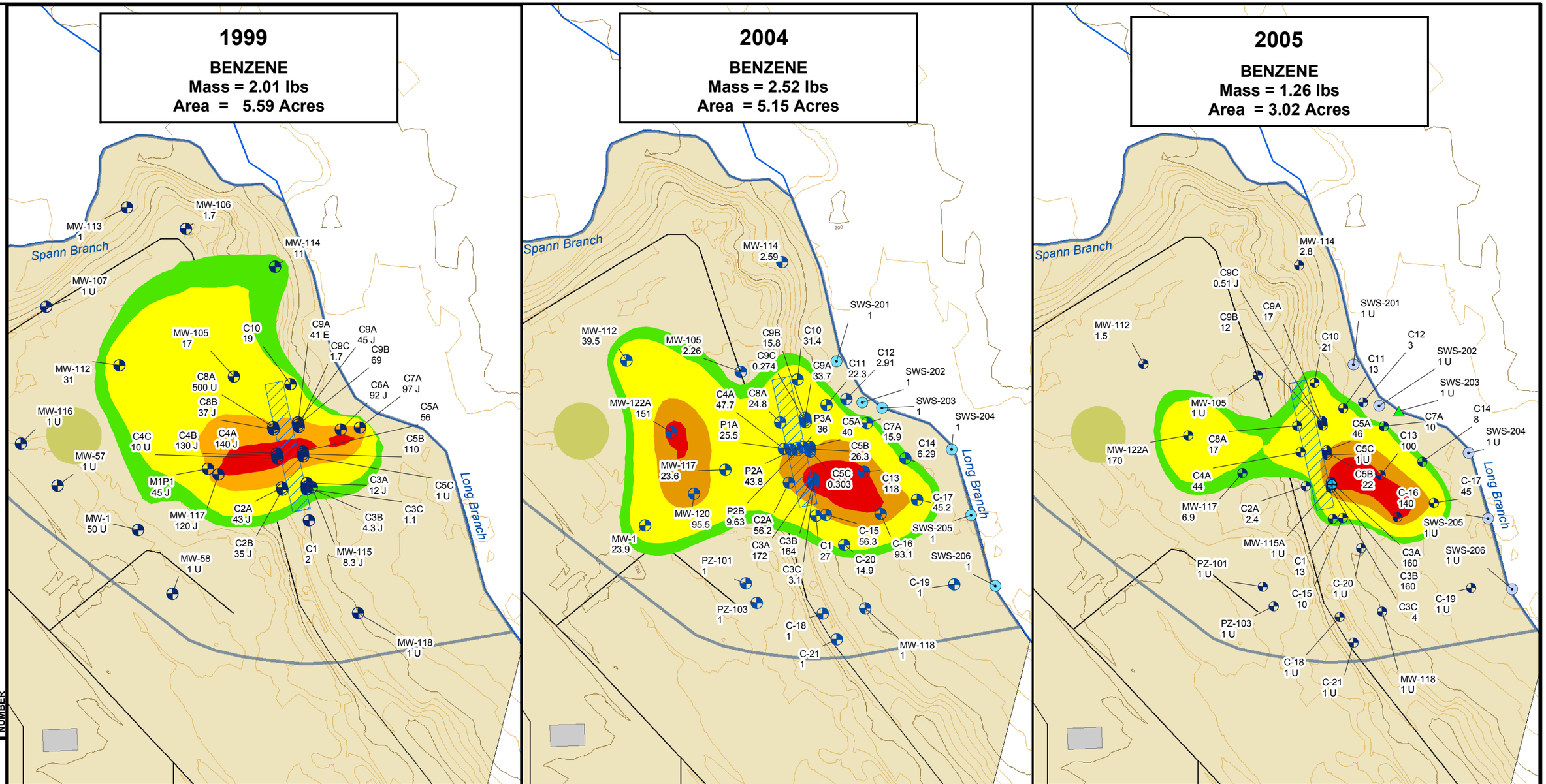
SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 4-6

Operable Unit 4 (OU4)
cis-1,2-DICHLOROETHENE Metrics



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9/28/2005 -- 2:36:21 PM

DRAWING NUMBER

DRAWN BY Monroeville

OFFICE K.Masterson

Legend

- Shaw AFB Boundary
- Buildings
- Pond
- Former Fire Ring
- PRB Wall
- Roads - on base
- Roads - off base
- Stream
- Ground Contour (10 ft)
- Ground Contour (2 ft)

Benzene (µg/L)

- 5 - 10
- 10 - 50
- 50 - 100
- >100

N

0 100 200 400 Feet

REFERENCE/PROJECTION: NAD83 State Plane

Shaw®

SHAW AIR FORCE BASE
SUMTER, SOUTH CAROLINA

FIGURE 4-7

Operable Unit 4 (OU4)
Benzene Metrics

APPENDIX A

GROUNDWATER ELEVATION LOGS AND PURGE LOGS

GAUGING FOR SITE OU-4, SHAW AIR FORCE BASE

Well Location	Well ID	DTP	DTW	TD	Date	Annual - VOCs	Ferrous Iron	M/E/E
OU-4	C-1		4.88	25.20	3/15/2005	YES	Yes	Yes
OU-4	C-2A		6.85	14.60	3/15/2005	YES	No	
OU-4	C-2B		6.20	24.50	3/15/2005	No		
OU-4	C-3A		5.02	14.39	3/15/2005	YES	Yes	Yes
OU-4	C-3B		4.98	25.95	3/15/2005	YES	No	
OU-4	C-3C		4.90	37.25	3/15/2005	YES	No	
OU-4	C-4A		6.75	15.20	3/15/2005	YES	No	
OU-4	C-4B		6.80	25.50	3/15/2005	No		
OU-4	C-4C	6.52	6.55	34.83	3/15/2005	No		
OU-4	C-5A		4.43	14.07	3/15/2005	YES	Yes	Yes
OU-4	C-5B		4.37	26.19	3/15/2005	YES	No	
OU-4	C-5C		4.38	37.63	3/15/2005	YES	No	
OU-4	C-6A		2.70	14.57	3/15/2005	No	Yes	Yes
OU-4	C-7A		3.00	15.00	3/15/2005	YES	Yes	Yes
OU-4	C-8A		6.89	14.64	3/15/2005	YES	No	
OU-4	C-8B		6.73	24.83	3/15/2005	No		
OU-4	C-9A	4.81	4.82	14.70	3/15/2005	YES	Yes	Yes
OU-4	C-9B	4.78	4.79	26.48	3/15/2005	YES	No	
OU-4	C-9C	4.87	4.96	36.85	3/15/2005	YES	No	
OU-4	C-10	6.03	6.05	26.15	3/15/2005	YES	Yes	Yes
OU-4	C-11		3.89	8.90	3/15/2005	YES	Yes	Yes
OU-4	C-12		3.15	8.80	3/15/2005	YES	Yes	Yes
OU-4	C-13		3.25	8.92	3/15/2005	YES	Yes	Yes
OU-4	C-14		3.85	8.93	3/15/2005	YES	Yes	Yes
OU-4	C-15		5.68	24.00	3/15/2005	YES	Yes	Yes
OU-4	C-16		2.20	14.00	3/15/2005	YES	Yes	Yes
OU-4	C-17		2.10	8.80	3/15/2005	YES	Yes	Yes
OU-4	C-18		4.43	13.11	3/15/2005	YES	Yes	Yes

Note: May actually be bio fouling in well 7/6/05

GAUGING FOR SITE OU-4, SHAW AIR FORCE BASE

Well Location	Well ID	DTP	DTW	TD	Date	Annual - VOCs	Ferrous Iron	M/E/E
OU-4	C-19		2.55	9.48	3/15/2005	YES	Yes	Yes
OU-4	C-20		4.82	19.11	3/15/2005	YES	Yes	Yes
OU-4	C-21		10.85	27.78	3/15/2005	YES	Yes	Yes
OU-4	P-1A	5.81	5.82	15.20	3/15/2005	No		
OU-4	P-2A		5.70	14.29	3/15/2005	No		
OU-4	P-2B		5.70	25.63	3/15/2005	No		
OU-4	P-3A		5.05	15.15	3/15/2005	No		
OU-4	PW-1A	dry			3/15/2005	No		
OU-4	PW-2A		5.73	14.29	3/15/2005	No		
OU-4	PW-3A	well bent	probe won't	fit	3/15/2005	No		
OU-4	PW-3B	well bent	probe won't	fit	3/15/2005	No		
OU-4	PW-4A		3.40	4.73	3/15/2005	No		
OU-4	PW-5A		6.40	14.33	3/15/2005	No		
OU-4	PW-6A		4.40	14.34	3/15/2005	No		
OU-4	PW-6B		4.79	27.00	3/15/2005	No		
OU-4	PW-7A	dry		4.50	3/15/2005	No		
OU-4	PW-8A		4.35	19.37	3/15/2005	No		
OU-4	M1P1	15.35	15.38	36.95	3/14/2005	No		
OU-4	MW-1		16.20	18.86		YES	No	
OU-4	MW-57		15.90	19.17		No		
OU-4	MW-58		20.93	22.57	3/16/2005	No		
OU-4	MW-105		13.85	21.95	3/14/2005	YES	No	
OU-4	MW-105D	pump in	well		3/14/2005	No		
OU-4	MW-106		17.73	28.15	3/15/2005	No		
OU-4	MW-106D	pump in	well		3/14/2005	No		
OU-4	MW-107		11.85	22.10	3/16/2005	No		
OU-4	MW-111	21.92	21.93	29.80	3/16/2005	No		
OU-4	MW-112		15.35	27.25	3/14/2005	YES	No	

GAUGING FOR SITE OU-4, SHAW AIR FORCE BASE

Well Location	Well ID	DTP	DTW	TD	Date	Annual - VOCs	Ferrous Iron	M/E/E
OU-4	MW-112A	20.4	20.41	91.55	3/14/2005	No		
OU-4	MW-112D	pump in	well		3/14/2005	No		
OU-4	MW-113		7.15	10.16		No		
OU-4	MW-113A	7.33	7.34	37.28		No		
OU-4	MW-114		7.10	22.45	3/15/2005	YES	No	
OU-4	MW-115		4.43	19.80	3/15/2005	No	No	
OU-4	MW-115A	7.78	7.79	71.25	3/15/2005	Yes (added)	Yes	Yes
OU-4	MW-116		15.72	18.85	3/14/2005	No		
OU-4	MW-116A	21.8	21.81	97.60	3/14/2005	No		
OU-4	MW-117		14.81	24.00	3/14/2005	YES	No	
OU-4	MW-118		4.00	13.15	3/15/2005	YES	Yes	Yes
OU-4	MW-119A					No		
OU-4	MW-120	15.6	15.63	27.55	3/14/2005	YES	No	
OU-4	MW-120A		15.65	48.90	3/14/2005	No		
OU-4	MW-120B		19.81	72.5	3/14/2005	No		
OU-4	MW-121		15.80	37.95	3/14/2005	No		
OU-4	MW-121A		16.00	25.40	3/14/2005	No		
OU-4	MW-122		16.55	37.51	3/14/2005	No		
OU-4	MW-122A		16.30	27.20	3/14/2005	YES	No	
OU-4	PZ-101		18.97	32.00	3/16/2005	YES	No	
OU-4	PZ-103		19.80	36.60	3/16/2005	YES	No	
OU-4	SWS-201					YES	No	
OU-4	SWS-202					YES	No	
OU-4	SWS-203					YES	No	
OU-4	SWS-204					YES	No	
OU-4	SWS-205					YES	No	
OU-4	SWS-206					YES	No	
						43	20	20

4/19/05 Page log indicates 0.21' LNAPL present at time of sampling. FB 7/6/05.

MH

VOC (bailer)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-1	**SAMPLE ID:**	OU041029
DATE:	4/14/05	**QC SAMPLE:**	

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17 gal/ft		6″ diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	18.86 ft		4″ diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3″ diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2″ diameter = 0.17 gal/ft
F. Static Water Level (TOC):	16.05 ft		1″ diameter = 0.041 gal/ft
G. Water Column Height (C - F):	2.81 ft		
H. Well Volume (G x B)	0.477 gal		
I. Three Well Volumes (H x 3)	1.43 gal		

PURGING METHOD: X **Bailer** ___**Pump Down/Recover** ___**Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: RICH BALDINO

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-1	**SAMPLE ID:**	OU041029
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14/05			≈1.3	5.48	18.2	0.077	350	5.11	above Instr. Range.	Cloudy Strong Odor

Comments:

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL.

VOC (peristaltic

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-105	**SAMPLE ID:**	OU041030
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

				Approx. Unit Casing Vol.
A. Well Diameter:	2	inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	0.17	gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	21.95	ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:		ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)		ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	13.50	ft		
G. Water Column Height (C - F):	8.45	ft		
H. Well Volume (G x B)	1.44	gal		
I. Three Well Volumes (H x 3)	4.3	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05 0950	0.1

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/14/05 1013	0.0	4/14/05 1030	0.0	4/14/05 1042	0.0		

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-105	**SAMPLE ID:**	OU041030
DATE:	4/14/05	**QC SAMPLE:**	Native

start 13.50.

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	1011		0.1	5.62	15.86	0.041	241.3	5.65	38.3	clear, no odor
	1014	13.53	0.2	5.60	15.79	0.040	241.0	5.06	28.3	
	1017		0.3	5.53	15.85	0.039	240.6	3.95	21.0	
	1022	13.55	0.5	5.52	15.63	0.038	241.2	3.81	15.7	
	1025		0.6	~~4~~ 5.47	15.63	0.038	241.1	3.59	13.6	
	1028	13.55	0.7	5.51	15.85	0.038	240.7	3.52	11.7	
	1031		0.8	5.54	15.81	0.038	240.5	3.53	10.48	
	1034	13.56	0.9	5.49	15.87	0.038	240.3	3.30	8.97	under 10 NTU
	1037		1.0	5.47	15.95	0.037	240.7	2.96	9.24	
1040	~~1100~~	13.56	1.1	5.53	15.96	0.037	240.5	2.38	7.57	
	1043		1.2	5.49	15.90	0.037	240.6	2.51	6.11	
	1046	13.57	1.3	5.49	16.02	0.036	240.4	2.24	5.50	
	1049		1.4	5.54	16.06	0.037	240.1	2.09	5.13	
	1052	13.56	1.5	5.51	16.10	0.036	240.0	2.30	5.33	
			SAMPLE TIME				1055			

Comments:
Low Flow! Professional judgement to sample. Turbidity under 10. DO slightly fluctuating.

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

LL

LIMS # 7222

VOC (peristaltic

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-105	**SAMPLE ID:**	OU041030R
DATE:	4/14/05	**QC SAMPLE:**	Replicate

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	21.95 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

SEE NATIVE LOG

PURGING METHOD: ___Bailer ___Pump Down/Recover ___Low-flow*
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-105	**SAMPLE ID:**	~~SAW~~ 02U041030R
DATE:	4/14/05	**QC SAMPLE:**	Replicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
		SEE	NATIVE		LOG					

Comments:

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

LL

VOC (peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-105	**SAMPLE ID:**	OU041031
DATE:	4/14/05	**QC SAMPLE:**	Duplicate

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	21.95 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

SEE NATIVE LOG

PURGING METHOD: ___ Bailer ___Pump Down/Recover ___Low-flow*

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-105	**SAMPLE ID:**	OU041031
DATE:	4/14/05	**QC SAMPLE:**	Duplicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
			SEE NATIVE LOG							

Comments:

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

HL

VOC (grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-112	**SAMPLE ID:**	OU041032
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2"	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	27.25	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	15.21	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	12.04	ft		
H. Well Volume (G x B)	2.05	gal		
I. Three Well Volumes (H x 3)	6.14	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ✓ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
04/15/05 10:15 hrs	6.5 ppm

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
04/15/05 10:17 hrs	0.2 ppm	04/15/05 11:23	0.0 ppm				

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-112	**SAMPLE ID:**	OU041032
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Low Volume purge 200 mL/minute

Date (2005)	Time (00:00)	DTW (feet)	~~Gallons~~ L Removed	pH (.1)	Temp (°C) (18.8)	Sp. Cond. Units: mS/cm (3.8)	ORP (mV) (10.m)	DO (mg/L) (10.8)	Turb. (NTUs) (10.8)	Remarks (odor, color, clarity, etc.)
4/15	11:16	~~0.6~~ 15.22	0.6 L	6.16	18.94	0.076	79.4	1.06	15.9	Clear H_2O No Odor
	11:19	15.22	1.2	6.11	19.48	0.077	78.3	0.78	12.7	" "
	11:22	15.22	1.8	6.07	19.94	0.077	78.9	0.54	10.16	" "
	11:25	15.22	2.4	6.06	20.14	0.077	81.3	0.55	9.26	" "
	11:28	15.22	3.0	6.05	20.17	0.076	83.7	0.44	8.46	" "
	11:31	15.22	3.6	6.04	20.45	0.075	84.5	0.39	8.73	" "
	11:34	15.22	4.2	6.04	20.34	0.075	86.9	0.31	9.14	
	11:37	15.22	4.8	6.04	20.53	0.074	86.7	0.32	8.46	
	11:40	15.22	5.4	6.03	20.48	0.074	88.5	0.30	8.89	

Comments: 83 Hz frequency of pump

INSPECTOR: Jorge A. Grin

S://2002028/Shaw Purge log (2004)

mm

VOC (peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-114	**SAMPLE ID:**	OU041033 + OU041033MS + OU041033MSD
DATE:	4/14/05	**QC SAMPLE:**	Native + MS/MSD

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	22.45 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	6.7 ~~7.7~~ (au) ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	15.75 ft		
H. Well Volume (G x B)	2.6 gal		
I. Three Well Volumes (H x 3)	8.03 gal		

PURGING METHOD: ___ ~~Bailer~~ ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05 1508	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/14/05 1536	4/14/05 (au) 0.0	4/14/05 1555	0.0				

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-114	**SAMPLE ID:**	04041033 + 04041033MS + 04041033MS
DATE:	4/14/05	**QC SAMPLE:**	Native + MS/MSD

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	1518	~~7.76~~ 7.7	0	START PUMPING						
	1522		0.1	5.30	16.44	0.019	231.6	1.12	55.3	clear, no odor
	1528	7.1	0.15	5.12	16.12	0.021	230.0	0.59	10.37	
	1530		0.25	5.14	16.05	0.022	229.4	0.54	7.98	
	1533	7.1	0.35	5.18	16.07	0.022	228.6	0.44	10.76	
	1536		0.5	5.24	16.07	0.023	227.0	0.33	5.15	slight odor, no color
	1539		0.6	5.25	16.12	0.023	226.1	0.29	4.64	↓
	1542	7.1	0.8	5.29	16.14	0.024	225.3	0.25	4.05	↓
	1545		1.0	5.32	16.08	0.024	224.9	0.22	3.63	↓
	1548		1.2	5.31	15.99	0.024	224.8	0.21	3.79	↓
	1551		1.4	5.28	15.94	0.023	224.8	0.20	3.71	↓
			SAMPLE TIME 1555							

Comments:

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

HH

Well Pre-Sample Purging Record

* May have product??

VOC
FE
MEE
(grundfos)

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-115A	**SAMPLE ID:**	OU041034
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	71.25 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	7.40 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	63.85 ft		
H. Well Volume (G x B)	10.85 gal		
I. Three Well Volumes (H x 3)	32.56 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05 1140	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/15/1212	0.0	4/15/1221	0.0				

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-115A	**SAMPLE ID:**	OU041034
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	~~Gallons~~ L Removed	pH	Temp (°C)	Sp. Cond. Units: uS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/15	1200	7.40	0.6	4.38	18.24	0.052	193	8.24	7.0	Clear, no color or odor
	1203		1.2	4.31	18.46	0.054	198	8.78	0.85	
	1206		1.8	4.33	18.6	0.054	200	8.10	0.00	
	1209		2.4	4.33	18.63	0.055	200	8.03	0.00	
	1212		3	4.36	18.7	0.055	198	7.81	0.00	
	1215		3.6	4.36	18.73	0.055	199	7.8	0.00	
	1218		4.2	4.36	18.77	0.055	200	7.75	0.00	
	1221	8.04	4.8	4.36	18.78	0.055	200	7.73	0.00	

Comments:
Begin purge 200 mL/min, Grundfos running 63.6 ~~Hz~~ Hz

INSPECTOR: [signature]

Fe^{+2} Filtered = 0.0 mg/L
Non Filtered = 0.01 mg/L

S://2002028/Shaw Purge log (2004)

HH

VOC (peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-117	**SAMPLE ID:**	OU041035
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	24 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	14.7 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	9.3 ft		
H. Well Volume (G x B)	1.6 gal		
I. Three Well Volumes (H x 3)	4.7 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

~~PID~~ MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05 1525	2.7

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/19/05 1535	0.0						

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-117	**SAMPLE ID:**	04041035 & Replicate 04041035R
DATE:	4/19/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: uS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1525	15.72	0.05	2.22	19.70	0.104	127.1	2.54	40.7	Slight odor & clear
	1530	16.79	0.2	2.12	18.62	0.099	156.6	~~2.1~~ 2.4	52.7	
	1535	16.78	0.4	2.11	18.61	0.099	158.8	1.24	41.5	
	1540	16.78	0.6	2.11	18.50	0.100	155.8	0.75	68.6	
	1545	16.77	1.0	2.98	19.08	0.104	135.0	0.28	56.8	
	1550	17.13	1.3	3.51	19.17	0.107	121.2	0.25	31.4	
	1555	17.10	1.5	3.92	19.20	0.111	111.7	0.20	19.8	
	1600	17.10	2.2	4.18	19.06	0.115	104.9	0.15	12.5	*Sample collected
	1605	17.10	3.0	4.29	19.19	0.117	100.4	0.12	7.69	@ ~~1600~~
	1610	17.10	3.5	4.18	19.05	0.117	100.2	0.13	5.82	1615

Comments:

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL

VOC
FE
RSK-175, MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-118	**SAMPLE ID:**	OU041036
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

				Approx. Unit Casing Vol.
A. Well Diameter:	2	inches		6″ diameter = 1.5 gal/ft
B. Unit Casing Volume:	0.17	gal/ft		4″ diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	13.15	ft		3″ diameter = 0.37 gal/ft
D. Well Design Depth:		ft		2″ diameter = 0.17 gal/ft
E. Sediment in Well (D – C)		ft		1″ diameter = 0.041 gal/ft
F. Static Water Level (TOC):	4.80	ft		
G. Water Column Height (C - F):	8.35	ft		
H. Well Volume (G x B)	1.42	gal		
I. Three Well Volumes (H x 3)	4.26	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05 1235	0.9

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1235	0.9	1255	0.4				

4/14/05

INSPECTOR: _____

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-118	**SAMPLE ID:**	OU041036
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	1235	4.54	0.05	5.59	14.30	0.148	277.2	3.09	116	
	1240	4.51	0.50	5.56	15.31	0.152	335.9	2.46	36.3	
	1245	4.52	1.0	5.56	15.33	0.152	352.3	2.30	21.0	
	1250	4.52	1.2	5.55	15.46	0.152	366.1	2.18	16.2	
	1255	4.51	1.5	5.55	15.45	0.152	368.5	2.18	10.26	
	1300	4.51	1.8	5.55	15.45	0.152	357.1	2.06	5.40	
	1305	4.51	2.0	5.54	15.52	0.152	328.0	2.07	3.63	
	1310	4.52	2.8	5.53	15.58	0.152	259.0	2.08	3.27	
	1315	4.52	3.0	5.51	15.72	0.152	265.0	2.05	3.11	
	1320	4.52	3.2	5.49	15.77	0.152	268.7	2.02	2.51	
	1325	4.52	3.5	5.48	15.67	0.152	253.7	1.97	2.66	
	1330	4.52	4.0	5.50	15.70	0.152	239.5	1.97	0.37	

Comments: Fe^{+2} Filtered= 0.05 mg/L
NON Filtered = 0.05 mg/L

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

HH

Well Pre-Sample Purging Record

May have product.

VOC

PROJECT NAME: *Shaw AFB, Semi-annual Sampling*	**SITE:** OU-4
WELL NAME: MW-120	**SAMPLE ID:** OU04 1037
DATE: 4/19/05	**QC SAMPLE:** Native

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	27.55 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	15.65 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

Depth to Product 15.44

PURGING METHOD: ___ **Bailer** ~~___ **Pump Down/Recover**~~ ___ **Low-flow***

(*CIRCLE ONE: peristaltic / ~~bladder~~ / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05 1111	195.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: Kista Bunch

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-120	**SAMPLE ID:**	OU041037
DATE:	4/19/05	**QC SAMPLE:**	NATIVE

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
					PRODUCT					
						NO SAMPLE				

Comments:

INSPECTOR: Kristen Burnette

S://2002028/Shaw Purge log (2004)

HL

Well Pre-Sample Purging Record

May have product.

VOC (grundfos)

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-122A	**SAMPLE ID:**	OU04 1038
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	27.2 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	16.12 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	11.08 ft		
H. Well Volume (G x B)	1.88 gal		
I. Three Well Volumes (H x 3)	~~5.64~~ gal 5.64		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05	2.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
945	0.0						

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	MW-122A	**SAMPLE ID:**	OU04 1038
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: S/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/15	0935	16.30	~~2.5~~ 1.5	5.9	18.75	0.110	-35.6	2.44	39.8	Hydrocarbon odor cloudy-clear
	0940	16.27	~~2.9~~ 1.9	6.15	19.6	0.135	-57.8	2.59	22.4	
	0945	16.27	2.4	6.41	20.27	0.159	-82.4	2.79	11.6	
	0950	16.27	2.6	6.44	20.47	0.171	-83.5	2.72	9.96	
	0955	16.27	3.0	6.48	20.78	0.176	-86.5	2.78	5.85	
	1000	16.30	3.5	~~6.85~~ 6.49	20.8	0.199	-92.5	2.86	3.31	
	1005	16.30	4.0	6.47	20.75	0.208	-83.7	2.48	0.56	* Control stopped working
**	1025	~~16.30~~ 16.22	4.5	6.08	19.86	0.206	-19.3	5.46	8.96	properly & had to be
	1030	16.25	4.8	5.96	21.38	0.216	-13.2	4.89	4.62	replaced
	1035	16.21	5.0	6.22	22.12	0.214	-27.7	4.10	3.52	
	1040	16.2	5.2	6.37	21.86	0.214	-52.3	3.44	1.27	
	1045	16.2	5.4	6.33	21.87	0.214	-49.9	3.39	2.33	
	1050	16.21	5.6	6.32	21.83	0.216	-48.2	3.40	2.0	

Comments: 84.2 Hrs running pump + 200 mL/min. **Moved another control out to well + resumed purging activities

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL

VOC (grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	PZ-101	**SAMPLE ID:**	OU041039
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2"	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	32	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	18.82	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	13.18	ft		
H. Well Volume (G x B)	2.24	gal		
I. Three Well Volumes (H x 3)	6.7	gal		

PURGING METHOD: ___ Bailer ____Pump Down/Recover ____Low-flow*
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
04/15/05 09:00hrs	0.0 ppm

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/15/05 09:40	0.0 ppm						

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	PZ-101	**SAMPLE ID:**	OU041039
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units ~~mS~~/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	09:55								35.3.	Purging well using the
	10:42		7.0	6.03	19.91	0.043	163.2	8.04		bail (Began purging at 09:25).
	6:45			6.02	19.60	0.063	174.6	7.82		– Sample is clear
	10:47			6.00	19.58	0.066	180.3	7.65		– Sample has no odor
										09:55 collected Sediment
										Turbidity readings.
										– will return with a YSI
										Twith metal attachment to lower
										into the well.

Comments:
– Team # 3 Could not use pump to extract Monitor well volumes due to a change of PVC diameter. the casing begins to narrow about 5' feet below top of casing

INSPECTOR: Jesus A. Sanchez

LL.

VOC (grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	PZ-103	**SAMPLE ID:**	OU04 1040
DATE:	04/14/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2"	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	36.6	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	19.56	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	17.04	ft		
H. Well Volume (G x B)	2.90	gal		
I. Three Well Volumes (H x 3)	8.69	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05 15:20	0.0 ppm

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/14/ 15:48	0.0 ppm	4/14 16:02	0.0 ppm				

INSPECTOR: Jorge

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	PZ-103	**SAMPLE ID:**	OU04 1040
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Low Volume purge 200ml/min.

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	15:42	19.56	.6L	4.70	20.32	0.116	169.1	3.77	47.2	clear, No odor
	15:45		1.2L	4.66	20.50	0.116	173.6	3.66	34.0	" "
	15:48		1.8L	4.64	20.57	0.116	176.9	3.59	21.1	" "
	15:51	19.68	2.4L	4.60	20.74	0.114	180.0	3.57	17.3	" "
	15:54	19.60	3.0L	4.61	20.58	0.114	180.9	3.55	16.0	" "
	15:57		3.6	4.58	20.28	0.113	182.4	3.53	17.0	" "

Comments: 93.2 Hz pump frequency

INSPECTOR: Jorge

S://2002028/Shaw Purge log (2004)

LH.

VOC
FE
MEE
(peristaltic

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-1	**SAMPLE ID:**	04041000
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

				Approx. Unit Casing Vol.
A. Well Diameter:	2.0	inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	0.17	gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	25.2	ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:		ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)		ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	4.86	ft		
G. Water Column Height (C - F):		ft		
H. Well Volume (G x B)		gal		
I. Three Well Volumes (H x 3)		gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/19 1230	0.0						

INSPECTOR: _____

S://2002028/Shaw Purge log (2004)

LH.

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-1	**SAMPLE ID:**	OU041000
DATE:	4/19/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1215	4.94	0.1	2.8	17.10	0.230	170.0	1.44	60.7	Brownish-clear no odor
	1220	4.94	0.3	3.08	16.45	0.223	198.2	1.22	10.89	
	1225	4.94	0.4	3.11	16.53	0.224	199.3	1.06	10.08	
	1230	4.94	0.6	3.25	16.50	0.227	200.5	0.82	4.39	
	1235	4.94	1.0	3.24	16.51	0.229	201.3	0.59	2.89	
	1235	4.94	1.3	3.28	16.56	0.231	200.4	0.47	1.90	
	1240	4.94	1.0	3.28	16.51	0.229	200.2	0.41	1.87	
	1245	4.94	2.2	3.26	16.53	0.230	201.7	0.35	0.91	
										* Collected samples @ 1250

Comments:

Fe^{+n} = Unfiltered: 0.15 mg/L
= Filtered: 0.25 mg/L

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

HH

VOC (peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-2A	**SAMPLE ID:**	OU041001
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	14.6 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	6.64 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	7.96 ft		
H. Well Volume (G x B)	1.35 gal		
I. Three Well Volumes (H x 3)	4.1 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05 1410	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-2A	**SAMPLE ID:**	OU041001
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/15	1434	0	0.1	4.67	17.85	0.004	194.4	3.68	181	clear, no odor
	1437	6.84	0.2	4.78	17.26	0.004	210.2	3.84	126	
	1442		0.3	4.88	17.04	0.004	213.8	3.75	119	
	1447	7.0	0.5	5.09	16.92	0.004	216.8	3.49	122	
	1452		0.7	5.13	17.00	0.004	218.0	3.33	131	
	1457	7.4	1.0	5.15	16.92	0.004	220.3	3.28	130	
	1502		1.3	5.15	16.92	0.004	221.7	3.25	124	
			SAMPLE TIME 1505							

Comments:

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

HH

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3A	**SAMPLE ID:**	OU04 1002
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

			Approx. Unit Casing Vol.
A. Well Diameter:	2 inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	.17 gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	14.39 ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:	ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)	ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	5.01 ~~5.53~~ ft		
G. Water Column Height (C - F):	9.3 ft		
H. Well Volume (G x B)	1.58 gal		
I. Three Well Volumes (H x 3)	4.74 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05 1415	10.7

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1420	0.0	1435	0.0				

INSPECTOR: _____

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3A	**SAMPLE ID:**	OU041002
DATE:	4/19/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: µS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1415	5.5	0.3	4.11	16.64	0.265	63.2	0.19	23.9	Clear + slight odor
	1420	5.5	0.4	3.93	16.53	0.262	64.2	0.18	19.1	
	1425	5.65	0.5	3.92	16.46	0.266	65.4	0.20	16.8	
	1430	5.64	1.0	3.91	16.60	0.301	68.6	0.20	10.2	
	1435	5.7	1.2	3.89	16.56	0.309	70.1	0.24	13.9	
	1440	5.7	2.0	3.90	16.57	0.308	71.9	0.20	12.2	
										* Collected sample @ 1445

Comments: Filtered : 1.08 mg/L
NonFiltered : 1.48 mg/L

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

H.H.

VOC (peristaltic

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3B	**SAMPLE ID:**	OU04 1003
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

			Approx. Unit Casing Vol.
A. Well Diameter:	2 inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	0.17 gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	25.95 ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:	ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)	ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	4.91 ft		
G. Water Column Height (C - F):	21.04 ft		
H. Well Volume (G x B)	3.58 gal		
I. Three Well Volumes (H x 3)	10.73 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05 1330	19.1

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/19/05 1340	0.0	1400	0.0				

INSPECTOR: _____

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3B	**SAMPLE ID:**	OU041003
DATE:	4/19	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1335	5.2	0.4	3.74	17.96	0.476	25.8	0.05	2.49	clear w/ Hydrocarbon odors
	1340	5.2	0.6	3.95	17.94	0.465	16.5	0.07	1.58	
	1345	5.2	1.0	4.03	17.93	0.450	1.7	0.04	1.93	
	1350	5.2	1.3	3.96	17.83	0.429	-7.3	0.05	1.27	
	1355	5.2	2.2	4.04	18.10	0.414	-15.2	0.02	1.55	
	1400	5.2	2.6	4.05	18.00	0.407	-15.1	0.02	1.13	
	1405	5.2	3.0	4.02	18.02	0.403	~~0.01~~ -14.4	0.00	0.81	
										* Collected Sample @ 1410

Comments:

INSPECTOR:

S://2002028/Shaw Purge log (2004)

LM.

VOC (grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3C	**SAMPLE ID:**	OU041004
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2"	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	37.25	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.90	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	32.35	ft		
H. Well Volume (G x B)	5.4995	gal		
I. Three Well Volumes (H x 3)	16.50	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/~~Recover~~** ✓ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05 12:00	0.3 ppm

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/15 12:33	0.0 ppm	4/15 12:58	0.0 ppm				

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3C	**SAMPLE ID:**	OU041004
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Low Rate Volume purge 200ml/min

Date (2005)	Time (00:00)	DTW (feet)	~~Gallons~~ L Removed	pH (.1 u)	Temp (°C) (10 s)	Sp. Cond. Units:___ (3 s)	ORP (mV) (10 m)	DO (mg/L) (10 s)	Turb. (NTUs) (10 s)	Remarks (odor, color, clarity, etc.)
4/15	12:45	5.18	1L	4.90	19.04	0.026	182.5	5.19	37.6	Clear Liquid, No odor
	12:50	5.18	2L	4.87	18.95	0.026	183.1	5.12	27.1	" "
	12:55	5.18	3L	4.87	19.09	0.026	179.6	4.83	20.3	" "
	13:00	5.18	4L	4.84	19.15	0.026	180.5	4.98	14.8	" "
	13:05	5.18	5L	4.83	19.29	0.026	182.0	4.37	13.4	" "
	13:10	5.18	6L	4.82	19.35	0.027	183.0	4.42	11.3	" "
	13:15	5.18	7.0L	4.80	19.39	0.027	180.9	3.95	9.78	
	13:20	5.18	8.0L	4.81	19.59	0.027	179.2	4.10	8.66	
	13:25	5.18	9L	4.80	19.67	0.027	176.1	3.88	8.72	

Comments: 44.1 Hz pump frequency,

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

LM

LINE# 1222

VOC (grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3C	**SAMPLE ID:**	OU04 1004R
DATE:	4/15/05	**QC SAMPLE:**	Replicate

WELL DATA

A. Well Diameter:	2" inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	37.25 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ✓ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05 12:12	0.3 ppm

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: Joseph A. Gaul

S://2002028/Shaw Purge log (2004)

* Note: See well Pre-Sample Purging Record for Sample ID# OU04 1004

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3C	**SAMPLE ID:**	OU041004R
DATE:	4/15/05	**QC SAMPLE:**	Replicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
					See Well Pre-Sample Purging Record from Sample ID#					
										OU041004

Comments:

INSPECTOR: Jorge

S://2002028/Shaw Purge log (2004)

LM

VOC (grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3C	**SAMPLE ID:**	OU041005
DATE:		**QC SAMPLE:**	Duplicate

WELL DATA

			Approx. Unit Casing Vol.
A. Well Diameter:	inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	37.25 ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:	ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)	ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	ft		
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

* Note: See Well Pre-Sample Purging Record from Sample # OU041004

PURGING METHOD: ___ Bailer ____Pump Down/Recover ____Low-flow*
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: Jonge

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-3C	**SAMPLE ID:**	OU041005
DATE:		**QC SAMPLE:**	Duplicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
					See Well Pre-Sample Purging Record from Sample ID#					
										OU041004

Comments:

INSPECTOR: Jonge

S://2002028/Shaw Purge log (2004)

HH

VOC (peristaltic

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-4A	**SAMPLE ID:**	OU041006
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2"	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	15.2	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	6.7	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	8.5	ft		
H. Well Volume (G x B)	1.445	gal		
I. Three Well Volumes (H x 3)	4.34	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ✓ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
04/15/05 14:26	10.4 ppm

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/15/05 14:36	0.0 ppm						

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-4A	**SAMPLE ID:**	OU041006
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Low flow rate at 200ml/min.

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/15/05	14:45	6.65	0.6	5.56	18.39	0.078	96.5	2.05	8.15	Clear Liquid, No odor
	14:48	6.70	1.2	5.56	18.30	0.077	102.6	1.53	7.37	
	14:51	6.70	1.8	5.57	18.01	0.076	98.1	1.65	7.62	
	14:54	6.70	2.4	5.61	18.08	0.075	95.5	1.55	5.87	
	14:57	6.70	3.0	5.61	18.05	0.074	92.0	1.48	6.11	
	15:00	6.70	3.6	5.62	17.98	0.074	88.8	1.49	5.72	

Comments:

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

HH.

VOC
PE
MEE
(peristaltic

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-5A	**SAMPLE ID:**	OU041007
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	14.07 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.42 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	9.65 ft		
H. Well Volume (G x B)	1.64 gal		
I. Three Well Volumes (H x 3)	4.92 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05	3.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/19 1405	0.0	1415	0.0				

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-5A	**SAMPLE ID:**	OU041007
DATE:	4/19/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/19/05	1405	4.59	–	0.54	17.29	0.118	-100	0.40	1.7	No Odor, Slight color
	1410	4.59	1.0		17.30	0.118	-13	0.40	1.0	
	1415	4.59	2.0		17.25	0.118	10.8	0.41	—	
	1420	4.59	3.0		17.30	0.118	12.0	0.41	—	

Comments:

Fe^{+2} Filtered: 1.51 mg/L
Non Filtered: 0.77 mg/L

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

H.H.

VOC (peristaltic

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-5B	**SAMPLE ID:**	OU041008
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	26.19 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.36 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	21.83 ft		
H. Well Volume (G x B)	3.7 gal		
I. Three Well Volumes (H x 3)	11.1 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05 1300	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/15 1315	0.0						

INSPECTOR: _____

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-5B	**SAMPLE ID:**	OU041008
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/15	1300	4.36	0.5	5.98	18.88	0.096	43.9	0.62	0.00	Clear & odorless
	1305	4.40	0.9	6.13	18.78	0.095	24.3	0.44	0.00	
	1310	4.40	1.2	6.20	18.6	0.094	21.4	~~0.093~~ 0.36	0.00	
	1315	4.40	1.5	6.32	18.66	0.094	13.2	0.30	0.00	
	1320	4.40	2.0	6.42	18.74	0.094	7.3	0.29	0.00	
	1325	4.40	2.3	6.49	18.82	0.093	0.7	0.32	0.00	
	1330	4.40	2.6	6.57	18.78	0.092	-3.6	0.30	0.00	
	1335	4.40	2.9	6.70	18.73	0.091	-8.6	0.27	0.00	
	1340	4.40	3.4	6.92	18.76	0.091	-24.8	0.27	0.00	

Comments:

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL

VOC (grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-5C	**SAMPLE ID:**	OU041009
DATE:	04/14/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2"	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	37.63	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.30	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	33.33	ft		
H. Well Volume (G x B)	5.67	gal		
I. Three Well Volumes (H x 3)	17.0	gal		

PURGING METHOD: ___ Bailer ____Pump Down/Recover ____Low-flow*
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
04/14/05 10:00hr.	0.0 ppm

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/14/05 1100	0.0						

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-5C	**SAMPLE ID:**	OU041009
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.) Low flow at 200ml/min.
4/14	10:51	4.36	0.6 L	5.04	18.03	0.054	135.7	0.89	8.17	No odor – clear Brown H_2O
4/14	10:54	4.~	1.2 L	4.99	17.81	0.054	113.0	0.69	7.63	" "
4/14	10:57	4.58	1.8 L	4.88	17.82	0.055	107.0	0.98	7.35	" "
4/14	11:00	4.58	2.4 L	4.84	17.79	0.055	104.2	0.87	6.79	" "
	11:03		3.0 L	4.81	17.76	0.055	101.6	0.77	6.92	
	11:06		3.6	4.76	17.92	0.056	97.2	0.86	6.56	
	11:09		4.2	4.79	17.97	0.057	96.0	0.85	7.06	
	11:12		4.8	4.77	17.97	0.057	94.4	0.78	6.83	
	11:15		5.4	4.70	17.98	0.057	94.5	0.73	7.24	
	11:18		6.0	4.66	17.91	0.057	94.1	0.79	6.36	
	11:21	4.66	6.6	4.67	18.05	0.057	94.0	0.80	6.45	
		4.6								

Comments: 47.5 Hz pump frequency.

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

M.H.

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-7A	**SAMPLE ID:**	OU041010
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

				Approx. Unit Casing Vol.
A. Well Diameter:	2	inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	.17	gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	15	ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:		ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)		ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	3.10	ft		
G. Water Column Height (C - F):	11.9	ft		
H. Well Volume (G x B)	2.02	gal		
I. Three Well Volumes (H x 3)	6.06	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow*** ,
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05 1200	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/19 1205	0.0	1225	0.0				

INSPECTOR: Rusla Bunetw

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-7A	**SAMPLE ID:**	OU041010
DATE:	4/19/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units S/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/19	1208	3.10	.3	6.55	18.73	.047	108.7	2.42	12.8	clear no odor
	1212	3.20	.8	6.33	18.95	.046	118.1	1.46	10.6	
	1217	3.15	1.3	6.31	18.74	.051	125.2	0.84	8.01	
	1223	3.10	2	6.27	18.89	.051	126.7	0.40	6.53	
	1227	3.10	2.5	6.28	18.98	.045	123.1	0.25	6.05	
	1233	3.10	3.0	6.30	18.71	0.044	123.5	0.15	8.10	
	1238	3.15	3.5	6.29	18.85	.044	124.5	0.15	8.25	
	1244	3.10	4.0	6.29	18.90	0.044	123.8	0.14	6.50	
				Sample @			1250			

Comments:

Fe^{+2} = Filtered: 0.65
= Non Filtered: 0.56

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

HH

VOC (bailer)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-8A	**SAMPLE ID:**	OU041011
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	14.64	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	6.72	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	7.92	ft		
H. Well Volume (G x B)	1.35	gal		
I. Three Well Volumes (H x 3)	4.0	gal		

PURGING METHOD: X **Bailer** ____**Pump Down/Recover** ____**Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05 1416	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1640	0.0						

INSPECTOR: R. Baldino

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-8A	**SAMPLE ID:**	OU041011
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	1643			6.22	16.67	0.072	176.0	0.53	132	Cloudy, strong smell
	1645			6.19	16.63	0.072	173.0	0.35		
	1647			6.18	16.63	0.072	170.8	0.23		
				SAMPLE TIME:						

Comments:

INSPECTOR: R. Baldino

S://2002028/Shaw Purge log (2004)

H.H.

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-9A	**SAMPLE ID:**	OU041012
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	14.7 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.8 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	9.9 ft		
H. Well Volume (G x B)	1.68 gal		
I. Three Well Volumes (H x 3)	5.04 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05	1.1

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1330	0.0						

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-9A	**SAMPLE ID:**	OU04 1012
DATE:	4/19/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/19/05	1320	4.85	—	3.75	17.77	0.029	-540	0.39	1.0	No Color, No odor
	1330	4.85	2.0	3.18	17.64	0.030	-560	0.36	8.2	
	1335	4.85	3.0	3.03	17.64	0.031	-601	0.35	7.0	
	1340	4.85	4.0	2.98	17.60	0.032	-590	0.32	5.2	
	1345	4.85	5.0	2.95	17.57	0.031	-585	0.31	3.0	

Comments:

Fe^{+2} = NonFiltered: 0.11
= Filtered: 0.21

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

HH

VOC (peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-9B	**SAMPLE ID:**	OU041013
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	26.48 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.50 ~~4.36~~ ft	SS	1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	21.98 ft		
H. Well Volume (G x B)	3.74 gal		
I. Three Well Volumes (H x 3)	11.21 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05 1300	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1430	0.0						

INSPECTOR

S://2002028/Shaw Purge log (2004)

HH

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-9B	**SAMPLE ID:**	OU04 1013
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
~~4/15~~	~~1300~~	~~4.36~~	~~0.5~~	~~5.98~~	~~18.89~~	~~0.096~~	~~43.9~~	~~0.62~~	~~0.00~~	~~clear + odorless~~ JV
	~~1305~~	~~4.40~~	~~0.9~~	~~6.13~~	~~18.78~~	~~0~~ JV				
	1430	4.7	0.3	6.48	18.69	0.094	-77.3	0.69	11.1	Clear + odorless
	1435	4.75	0.4	6.48	18.50	0.093	-92.8	0.41	7.8	
	1440	4.75	0.7	6.56	18.61	0.124	-104.5	0.31	1.1	
	1445	4.75	1.0	6.62	18.68	0.122 ~~0.140~~	-114.0	0.26	0.0	
	1450	4.75	1.3	6.61	18.51	0.122	-121.5	0.23	0.0	

Comments:

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL.

VOC (peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-9C	**SAMPLE ID:**	OU041014
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	36.85 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.85 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	32.0 ft		
H. Well Volume (G x B)	5.44 gal		
I. Three Well Volumes (H x 3)	16.32 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05 1030	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/14/05 1207	0.1	4/14/05 1230	0.0				

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-9C	**SAMPLE ID:**	OU041014
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	1140	4.85	0	Begin pumping						
	1154	5.3	0.1	5.42	17.07	0.010	225.5	1.01	3.17	Clear, no odor
	1159	5.0	0.25	5.16	16.62	0.009	225.9	0.80	2.04	
	1202	4.95	0.35	5.12	16.46	0.009	225.7	0.68	1.97	
	1205	4.96	0.5	5.10	16.35	0.009	225.9	0.61	1.85	
	1208	4.95	0.6	5.13	16.26	0.009	226.7	0.50	1.94	
	1211	4.96	0.7	5.14	16.40	0.010	225.8	0.44	2.07	
	1214	4.96	0.8	5.15	16.32	0.009	226.4	0.41	2.25	
	1217	4.97	0.9	5.12	16.25	0.010	226.7	0.36	2.12	
	1220	4.97	1.0	5.12	16.31	0.010	226.5	0.34	2.01	
	1223	4.97	1.1	5.14	16.37	0.010	226.4	0.32	1.75	
	1226	4.98	1.2	5.15	16.36	0.010	226.2	0.31	1.92	
		SAMPLE		TIME			1230			

Comments:

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

HL

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-10	**SAMPLE ID:**	OU04/015
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	26.15	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	6.0	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	20.15	ft		
H. Well Volume (G x B)	3.4	gal		
I. Three Well Volumes (H x 3)	10.2	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05	11.7

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1220	0.0	1240	0.0				

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-10	**SAMPLE ID:**	OU041015
DATE:	4/19/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	~~Gallons~~ Liters Removed	pH	Temp (°C)	Sp. Cond. Units: ~~MS~~ mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/19	1215	6.17	—	3.12	~~18.94~~ 17.98	0.095	294	0.15	5.6	Clear, Slight Odor, No color
	1220	6.17	1.0	2.77	17.94	0.105	319	0.14	5.1	
	1225	6.17	2.0	2.53	17.84	0.115	350	0.12	3.0	
	1230	6.17	3.0	2.40	17.86	0.121	340	0.11	2.7	
	1235	6.17	4.0	2.10	17.98	0.133	354	0.12	2.0	
	1240	6.17	5.0	1.90	18.00	0.138	369	0.13	1.1	
	1245	6.17	6.0	1.89	17.99	0.140	372	0.11	1.0	
	1250	6.17	7.0	1.87	17.98	0.142	375	0.10	1.0	

Comments: Collect Replicate Sample OU041015R to replace lost samples from 4/15/05

Fe^{+2} Filtered = 3.25 mg/L
NonFiltered = 4.85 mg/L

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

MM

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-11	**SAMPLE ID:**	OU041016
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	8.9 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		~~3" diameter = 0.37 gal/ft~~
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.1 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	4.8 ft		
H. Well Volume (G x B)	0.82 gal		
I. Three Well Volumes (H x 3)	2.45 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

NO J-PLUG

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05 1208	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1225	0.0						

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	G-11	**SAMPLE ID:**	OU04 1016
DATE:	4/15/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: ms/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/15	1220	4.75	0.1	4.22	17.22	0.001	237.4	0.49	6.78	Clear, slight odor
	1223		0.2	4.29	17.22	0.001	230.6	0.47	5.74	
	1226	5.05	0.3	4.33	17.14	0.002	227.4	0.66	5.84	
	1229		0.5	4.38	17.20	0.002	226.2	0.77	5.92	
	1232	5.5	0.6	4.42	17.12	0.002	226.3	0.6	7.71	
	1236		0.8	4.40	17.35	0.002	225.9	0.96	8.81	
	1239	5.25	1.0	4.56	17.92	0.002	222.3	1.28	8.68	
	1242		1.2	4.69	17.92	0.002	221.3	1.42	7.06	
	1245	5.09	1.4	4.60	17.98	0.002	221.2	1.43	6.97	
	1248		1.6	4.54	17.95	0.002	221.0	1.39	6.20	
		SAMPLE TIME					1250			

Comments: Fe^{+2} Filtered = 0.63 mg/L
NON Filtered = 0.72 mg/L

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

MM

LIMS # 7222

VOC (peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-11	**SAMPLE ID:**	04041016R
DATE:	4/15/05	**QC SAMPLE:**	Replicate

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	8.9 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.1 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

SEE NATIVE LOG

PURGING METHOD: ___ Bailer ___ Pump Down/Recover ___ Low-flow*
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-11	**SAMPLE ID:**	OU041016R
DATE:	4/15/05	**QC SAMPLE:**	Replicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)

SEE NATIVE LOG

Comments:

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

MM

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-11	**SAMPLE ID:**	OU041017
DATE:	4/15/05	**QC SAMPLE:**	Duplicate

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	8.9 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.1 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

SEE NATIVE LOG

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ___ **Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-11	**SAMPLE ID:**	OU041017
DATE:	4/15/05	**QC SAMPLE:**	Duplicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)

SEE NATIVE LOG

Comments:

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

LL

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-12	**SAMPLE ID:**	OU041018 + OU041018MS + OU041018MSD
DATE:	4/14/05	**QC SAMPLE:**	Native + MS/MSD

WELL DATA

			Approx. Unit Casing Vol.
A. Well Diameter:	2	inches	6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	0.17	gal/ft	4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	8.8	ft	3" diameter = 0.37 gal/ft
D. Well Design Depth:		ft	2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)		ft	1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	3.15	ft	
G. Water Column Height (C - F):	5.65	ft	
H. Well Volume (G x B)	0.9	gal	
I. Three Well Volumes (H x 3)	2.88	gal	

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05 1247	1.1

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/14/05 1315	0.0	4/14/05 1334	0.1	4/14/05			

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

6

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-12	**SAMPLE ID:**	OU041018 + OU041018MS + OU041018 MSD
DATE:	4/14/05	**QC SAMPLE:**	Native + MS/MSD

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: ms/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	1312	3.15	0	START PUMPING						Clear, no odor
	1318	3.2	0.2	5.24	15.31	0.030	233.5	0.34	17.7	
	1322		0.4	5.33	15.33	0.030	231.8	0.21	15.5	
	1326	3.2	0.6	5.35	15.28	0.032	226.6	0.12	10.22	
1330	~~1400~~	3.21	0.8	5.37	15.25	0.034	222.6	0.08	9.37	
	1334	~~3.25~~	1.0	5.40	15.22	0.036	217.4	0.06	7.08	
	1338		1.3	5.42	15.23	0.037	215.2	0.06	6.02	slight odor, light yellow
	1342	3.21	1.6	5.44	15.24	0.038	213.5	0.06	5.66	
	1346		1.85	5.46	15.19	0.039	212.5	0.05	5.75	
	1350	3.22	2.0	5.49	15.28	0.039	211.3	0.05	5.41	
			SAMPLE TIME 1355							

Comments:

Fe^{+2} Filtered = ~~1.50 mg/L~~ KB 1.09 mg/L

NON Filtered = 1.50 mg/L

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

HH

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-13	**SAMPLE ID:**	OU041019
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	8.92 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	3.31 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	5.61 ft		
H. Well Volume (G x B)	.95 gal		
I. Three Well Volumes (H x 3)	2.86 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05 13:14	1.1

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1330	0.0	4/19/05 1348	0.0				

INSPECTOR: Krista Bruch

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-13	**SAMPLE ID:**	OU041019
DATE:	4/19/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1316	4.85 ~~4.85~~	.5	7.37	16.63	.181	5.2	0.0	11.7	clear, ~~no~~ odor slight odor
	1337	4.30	1	7.15	17.43	.185	1.0	2.71	12.1	* neg. DO had to re-calibrate
	1342	4.60	1.5	7.10	16.99	.183	-.8	1.96	7.95	
	1347	4.60	2	7.12	17.16	.183	-9.0	1.25	6.82	
	1353	4.60	2.5	7.20	16.73	.180	-15.7	0.62	9.08	
	1358	4.70	3.0	7.22	16.62	.179	-18.9	0.41	6.09	
	1403	4.65	3.5	7.22	16.77	.181	-24.5	0.24	6.20	
	1408	4.65	4	7.26	16.74	.181	-26.5	0.17	6.15	
	1413	4.70	4.5	7.20	16.67	.182	-33.8	0.12	8.00	
	1418	4.65	5	7.10	16.66	.181	-63.7	0.11	7.80	
										* ORP could not stabilize
										collected sample after 1 hr
							SAMPLE @		1425	

Comments:

Fe^{+2} = Filtered: 1.06 mg/L
Non Filtered: 1.29 mg/L

INSPECTOR: Kyla Bruetsch

S://2002028/Shaw Purge log (2004)

LH

VOC
FEE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-14	**SAMPLE ID:**	OU04 1020
DATE:	4/19/05	**QC SAMPLE:**	Native

WELL DATA

				Approx. Unit Casing Vol.
A. Well Diameter:	2	inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	.17	gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	8.93	ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:		ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)		ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	3.92	ft		
G. Water Column Height (C - F):	5.01	ft		
H. Well Volume (G x B)	.85	gal		
I. Three Well Volumes (H x 3)	2.5	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/19/05 1440	1.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/19 1450	0.0	1505	0.0				

INSPECTOR: Krista Bunch

S://2002028/Shaw Purge log (2004)

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-14	**SAMPLE ID:**	OU041020
DATE:	4/9/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond, Units: MS/CM	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1440	4.10	.5	5.67	15.57	.098	84.6	.06	18.4	clear, no odor
	1445	4.15	1	5.68	15.40	.099	82.1	.09	17.3	
	1450	4.20	1.3	5.66	15.38	.095	78.7	.32	10.30	
	1455	4.15	1.8	5.67	15.24	.083	75.6	.15	9.81	
	1500	4.18	2.3	5.65	15.32	.084	72.9	.10	8.95	
	1505	4.20	3	5.62	15.26	.086	66.2	.15	9.0	
	1510	4.18	3.4	5.63	15.20	.086	65.6	.15	8.6	
	1515	4.15	3.8	5.64	15.30	.086	64.8	.15	8.3	
	1520	4.15	4.2	5.65	15.34	.086	63.2	.13	8.2	
					SAMPLE @ 1525					

Comments: Filtered: 0.97 mg/L
Non Filtered: 1.43 mg/L

INSPECTOR: Kirsta Burnette

S://2002028/Shaw Purge log (2004)

MH

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-15	**SAMPLE ID:**	OU041021
DATE:	4/20/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	24	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	5.69	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	18.31	ft		
H. Well Volume (G x B)	3.1	gal		
I. Three Well Volumes (H x 3)	9.3	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/20/05 855	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1035	0.0						

INSPECTOR: Lysta Brunch

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-15	**SAMPLE ID:**	OU041021
DATE:	4/20/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/20	1026	6.02	0	6.13	16.4	0.235	82	0.98	1.9	Flow Rate 200mL/min
	1031	5.90	<0.5	6.03	16.7	0.270	72	0.63	1.2	
	1034	5.90	0.5	6.05	16.7	0.270	70	0.40	0.72	Flow Rate 200mL/min
	1037	5.90	<1.0	6.06	16.7	0.270	69	0.29	0.70	
	1042	5.92	1.0	6.06	16.8	0.270	67	0.29	0.51	
	1046	5.91	<1.5	6.06	16.8	0.269	66	0.27	0.46	
	1050	5.91	1.5	6.06	16.8	0.269	65	0.25	0.42	
	1055	Collect VOC, MEKs, total/filtered Cations								

Comments: Krista Barnett

Fe^{+2} Filtered: 1.26 mg/L
Non Filtered: 1.86 mg/L

INSPECTOR:_____

S://2002028/Shaw Purge log (2004)

MH

VOC
FE
MEE
(peristaltic

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-16	**SAMPLE ID:**	OU041022
DATE:	4/20/05	**QC SAMPLE:**	Native

WELL DATA

				Approx. Unit Casing Vol.
A. Well Diameter:	2	inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	.17	gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	14	ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:		ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)		ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	2.31	ft		
G. Water Column Height (C - F):	11.69	ft		
H. Well Volume (G x B)	1.9	gal		
I. Three Well Volumes (H x 3)	5.9	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

* No J Plug

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/20/05 900	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
1030	0.0						

INSPECTOR: Lynta Brown

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-16	**SAMPLE ID:**	OU04102Z
DATE:	4/20/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1012	2.45	.5	7.71	16.18	.166	-96.0	.01	24	Slight orange tint, some particulates
	1018	2.45	1	6.56	16.08	.137	-48.8	—	22	
	1025	2.50	1.5	6.21	16.15	.274	-41.5	1.89	20	
	1030	2.50	2.0	6.12	15.71	.263	-53.3	.97	18	
	1035	2.50	2.5	6.12	15.75	.261	-52.9	1.01	18	
	1040	2.50	3.0	5.99	15.85	.260	-45.5	1.16	18	
	1045	2.50	3.5	5.98	15.85	.260	-45.0	1.16	18	
	1050	2.50	4	5.98	15.90	.259	-40.8	1.01	17	
						SAMPLE @ 1055				

Comments:

Fe^{+2} Filtered: 1.64 mg/L
Non Filtered: 2.12 mg/L

INSPECTOR: Krista Brunelle

S://2002028/Shaw Purge log (2004)

MH

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-17	**SAMPLE ID:**	OU041023
DATE:	4/20/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	8.8	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	2.19	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	6.61	ft		
H. Well Volume (G x B)	1.1	gal		
I. Three Well Volumes (H x 3)	3.3	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/20/05 905	4.5

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
930	0.0						

INSPECTOR: Linda Bynum

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-17	**SAMPLE ID:**	OU041023
DATE:	4/20/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4.20	0915 ~~10:08~~	4.0	0.5	5.35	15.71	0.089	108	0.90	50	slight odor, yellow/brn/turbid
	0918	5.95	1.0	5.46	15.64	0.089	99.7	0.88	95	↓ flow rate to 200 mL/min
	0921	7.98	1.2	5.62	15.98	0.088	91.4	0.99	92	↓ flow rate to <100 mL/min
	0928	7.04	>1.5	5.65	15.99	0.089	87.0	0.74	89	↓ flow rate to <100 mL/min
	0934	6.05	2.0	5.71	16.04	0.092	74	0.48	42	H_2O ~~raisi~~ rising
	0937	6.10	>2.0	5.70	16.06	0.092	75	0.47	35.	
	0942	6.08	2.5	5.68	16.14	0.091	75	0.41	23	
	0948	6.20	3.0	5.67	16.09	0.092	73	0.38	16	parameters stabilized pump turned
	0959	3.59								off to recover well level.
	1000	Sampled for	VOC, MEEs,	total/filtered	Fe^{+2}					

Comments:

Fe^{+2} Filtered: 1.14 mg/L
Non Filtered: 1.95 mg/L

INSPECTOR: Kyla Brunelle

S://2002028/Shaw Purge log (2004)

LL

Well Pre-Sample Purging Record

VOC
FE
MEE
(peristaltic)

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-18	**SAMPLE ID:**	0404 1024
DATE:	4/15/05	**QC SAMPLE:**	Native

WELL DATA

				Approx. Unit Casing Vol.
A. Well Diameter:	2	inches		
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	~~13.11~~	ft	27.35	4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	10.99	ft	10.99	1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	~~2.12~~	ft	16.36	
H. Well Volume (G x B)	~~0.36~~	gal	2.78	
I. Three Well Volumes (H x 3)	~~1.08~~	gal	8.34	

PURGING METHOD: __ **Bailer** __ **Pump Down/Recover** X **Low-flow*** *~~Change to bailer due to low DTW.~~

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

LOW FLOW Peristaltic*

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/15/05 0909	0.3

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
950	0.0						

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-18	**SAMPLE ID:**	OU041024
DATE:	4/15/05	**QC SAMPLE:**	Native

bailed 2 gallons prior to pumping

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/15	0940		0.2	4.65	15.46	0.007	250.5	3.25	Error	cloudy, no odor
	0945	11.1	0.4	4.56	15.39	0.007	249.6	3.10	Error	
	0950		0.6	4.55	15.42	0.007	249.7	2.95	Error	
	0955	EMPTY	UNT CELL	-- TO	MUCH	CLOUDYNESS				
	1000	11.2	1.0	4.59	15.64	0.007	249.5	2.89	ERROR	
	1010		1.5	4.57	15.73	0.007	249.5	2.93	864	
	1020	11.2	2.0	4.60	~~17~~ 15.78	0.007	249.3	2.89	439	
	1030		2.5	4.60	15.95	0.007	248.8	2.92	235	
	1040	11.2	3.0	4.61	16.08	0.007	248.6	3.00	104.8	
	1050		3.5	4.64	16.62	0.007	247.0	3.07	54.4	
	1100	11.05	4.0	4.61	16.33	0.007	246.9	2.91	32.0	
	1105		4.2	4.58	16.25	0.007	247.1	3.04	24.4	
	1115	11.1	4.7	4.62	16.29	0.007	246.9	3.15	17.8	
	1125		5.3	4.56	16.20	0.007	247.3	3.23	12.6	
	1135		5.8	4.58	16.21	0.007	247.0	3.16	9.8	

Comments: SAMPLE TIME 1140

Fe^{+2} Filtered = 0.0 mg/L

Non Filtered = 0.01 mg/L

INSPECTOR: A. Warrington

S://2002028/Shaw Purge log (2004)

LL

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-19	**SAMPLE ID:**	OU041025
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	9.48 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.8 ~~2.59~~ ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	4.68 ft		
H. Well Volume (G x B)	0.79 gal		
I. Three Well Volumes (H x 3)	2.37 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/14/05 1510	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/14/05 1520	0.0	4/14/05 1530	0.0				

INSPECTOR: _____

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-19	**SAMPLE ID:**	OU-041025
DATE:	4/14/05	**QC SAMPLE:**	Native

1510

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	~~1410~~	4.8	0.4	4.38	14.86	0.051	427.7	0.61	53.3	
1515	~~1415~~	5.25	0.5	4.51	14.80	0.049	285.3	0.60	66.6	
1520	~~1420~~	6.12	1.0	4.69	14.78	0.048	172.6	0.55	70.1	
1525	~~1425~~	6.61	1.2	4.79	14.79	0.044	153.7	1.22	107.0	
	1530	7.25	1.5	4.75	14.83	0.046	184.1	0.76	153.0	
	1535	7.89	2.0	4.93	14.81	0.044	149.4	0.68	161.0	
	1540	8.68	2.2	5.07	14.82	0.043	135.0	0.87	115.0	
	1545	8.90	2.3	5.18	14.81	0.035	122.5	2.58	113.0	
	1550	9.20	2.4	5.18	14.79	0.038	121.2	3.14	112.0	
	1555	9.4	2.5	5.23	14.77	0.032	119.2	3.76		*Well purged Dry
	~~1600~~									
	~~1605~~									
	1625	*7.3								

Comments:
*After 30 min well did not recharge 80% after purged dry
will return + sample tomorrow.

INSPECTOR: [signature]

Fe^{+2} Filtered = 0.95 mg/L
NonFiltered = 1.30 mg/L

S://2002028/Shaw Purge log (2004)

LH

VOC
FE
MEE
(peristaltic)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-20	**SAMPLE ID:**	OU041026
DATE:	4/20/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	2 inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	.17 gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	19.11 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	4.90 ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	14.21 ft		
H. Well Volume (G x B)	2.4 gal		
I. Three Well Volumes (H x 3)	7.2 gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
4/20/05 910	0.0

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
4/20 1120	0.0						

INSPECTOR: Kyota Brunson

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-20	**SAMPLE ID:**	OU041026
DATE:	4/20/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/20	1125	5.08	.5	5.17	17.06	0.168	270.2	1.39	3.6	Clear, no odor
	1130	5.05	.8	5.08	17.19	0.168	380.8	1.39	4.0	
	1135	5.05	1.2	5.02	17.22	0.168	447.6	1.37	3.2	
	1140	5.08	1.8	4.90	17.03	0.166	510.1	1.28	2.94	→ ORP Meter does not look correct
	1145	5.05	2.2	4.99	17.30	0.162	87.9	1.94	3.0	values continue to increase, Sent
	1150	5.07	2.8	4.93	17.27	0.161	89.9	1.42	3.0	YSI Probes
	1155	5.07	3.1	4.90	17.36	0.161	94.0	1.31	3.2	
	1200	5.06	3.5	4.90	17.30	0.160	93.4	1.32	2.31	
							SAMPLED @ 1210			

Comments:

Fe^{+2} Filtered = 0.0 mg/L
Non Filtered = 0.0 mg/L

INSPECTOR: Kyle Brunson

S://2002028/Shaw Purge log (2004)

LL

VOC
FE
MEE
(grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-21	**SAMPLE ID:**	OU041027
DATE:	4/14/05	**QC SAMPLE:**	NATIVE

WELL DATA

A. Well Diameter:	2"	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	0.17	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	27.78	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:		ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)		ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	10.64	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	17.14	ft		
H. Well Volume (G x B)	2.91	gal		
I. Three Well Volumes (H x 3)	8.74	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)
04/14/05 12:03	0.0 ppm

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)
04/14/05/12:35	0.0 ppm	4/14 12:24	0.0 ppm				

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-21	**SAMPLE ID:**	OU041027
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Low volume purging at 200 ml/min

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH (±.1)	Temp (°C) (±.1°C)	Sp. Cond. Units: mS/cm (±3%)	ORP (mV) (±10 mV)	DO (mg/L) (±10%)	Turb. (NTUs) (±10%)	Remarks (odor, color, clarity, etc.)
4/14	12:35	10.64	1L	4.70	16.76	0.073	193.6	3.71	28.7	clear solution No odor
	12:40	–	2L	4.85	17.92	0.073	196.7	3.57	20.3	" "
	12:45	–	3L	4.86	18.62	0.094	203.1	3.50	17.4	" "
	12:50	–	4L	4.82	18.83	0.093	206.7	3.40	14.3	
	12:55	10.70	5L	4.79	18.80	0.093	207.9	3.32	12.2	
	13:00	–	6L	4.78	19.05	0.092	209.8	3.27	9.66	
	13:05	–	7L	4.78	19.13	0.091	208.7	3.23	8.87	
	13:10	–	8L	4.72	19.10	0.091	209.4	3.20	7.08	
	13:15	10.70	9L	4.76	19.34	0.090	206.4	3.18	6.79	
	13:20	–	10L	4.76	19.31	0.090	204.9	3.17	5.90	

Comments:

70.3 Hz pump frequency

Fe^{+2} Filtered = 0.01 mg/L

NONFiltered = 0.01 mg/L

INSPECTOR: Jorge A. Sanchez

S://2002028/Shaw Purge log (2004)

LIMS # 7222

VOC (grundfos)

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-21	**SAMPLE ID:**	OU041027R
DATE:	4/14/05	**QC SAMPLE:**	Replicate

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	27.78 ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

* Note: See Well Pre-Sample Purging Record for Sample ID# OU041027

INSPECTOR: Jonge

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-21	**SAMPLE ID:**	OU041027R
DATE:	4/14/05	**QC SAMPLE:**	Replicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
					* See Well Pre-Sample Purging Record ID# OU041027					

Comments:

INSPECTOR: Jorge

S://2002028/Shaw Purge log (2004)

LL

VOC
FE
MEE
(grundfos

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-21	**SAMPLE ID:**	OU041028
DATE:	4/14/05	**QC SAMPLE:**	Duplicate

WELL DATA

				Approx. Unit Casing Vol.
A. Well Diameter:		inches		6″ diameter = 1.5 gal/ft
B. Unit Casing Volume:		gal/ft		4″ diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	27.78	ft		3″ diameter = 0.37 gal/ft
D. Well Design Depth:		ft		2″ diameter = 0.17 gal/ft
E. Sediment in Well (D – C)		ft		1″ diameter = 0.041 gal/ft
F. Static Water Level (TOC):		ft		
G. Water Column Height (C - F):		ft		
H. Well Volume (G x B)		gal		
I. Three Well Volumes (H x 3)		gal		

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** X **Low-flow***
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: Jorge

S://2002028/Shaw Purge log (2004)

Note: See well Pre-Sample Purging Record for Sample ID # OU041027

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	C-21	**SAMPLE ID:**	OU041028
DATE:	04/14/05	**QC SAMPLE:**	Duplicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
					See well Pre-Sample Purging Record ID# OU041027					

Comments:

INSPECTOR: Jorge

S://2002028/Shaw Purge log (2004)

LL

VOC

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-201	**SAMPLE ID:**	OU04T041
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6″ diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	ft		4″ diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3″ diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2″ diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1″ diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

PURGING METHOD: ___ Bailer ____Pump Down/Recover ____Low-flow*
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: RICH BALDINO

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-201	**SAMPLE ID:**	OU04 1041
DATE:	4/14/05	**QC SAMPLE:**	NATIVE

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	1035			6.62	12.96	0.053	216.9	8.53	9.95	~~Gov~~ Clear - brn

Comments:

* Surface Water Sample

INSPECTOR: [illegible]

S://2002028/Shaw Purge log (2004)

LL

VOC

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-202	**SAMPLE ID:**	OU041042
DATE:	4/14/05	**QC SAMPLE:**	NATIVE

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6″ diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	ft		4″ diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3″ diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2″ diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1″ diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

PURGING METHOD: ___ **Bailer** ___**Pump Down/Recover** ___**Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: RICH BALDINO

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-202	**SAMPLE ID:**	OU04.1042
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
4/14	1045	NA	NA	6.72	12.92	0.053	236.9	8.92	14.7	Clear - brn

Comments: * Surface Water Sample

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL

VOC

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-203	**SAMPLE ID:**	OU041043
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

N/A

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ___ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: RICH BALDINO

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-203	**SAMPLE ID:**	04041043
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	0955	NA	NA	6.55	13.02	0.055	202.1	5.82		Brownish

Comments: * Surface Water Sample

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL.

VOC

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-203	**SAMPLE ID:**	OU041043R
DATE:	4/14/05	**QC SAMPLE:**	Replicate

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6″ diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	ft		4″ diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3″ diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2″ diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1″ diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

SEE NATIVE LOG

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ___ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR:_____

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-203	**SAMPLE ID:**	OU041043R
DATE:	4/14/05	**QC SAMPLE:**	Replicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)

SEE NATIVE LOG

Comments:

_____

_____

_____

INSPECTOR:_____

S://2002028/Shaw Purge log (2004)

ll.

VOC

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-203	**SAMPLE ID:**	OU041044
DATE:	4/14/05	**QC SAMPLE:**	Duplicate

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

SEE NATIVE LOG

PURGING METHOD: ___ Bailer ___ Pump Down/Recover ___ Low-flow*
(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR:_____

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-203	**SAMPLE ID:**	OU041044
DATE:	4/14/05	**QC SAMPLE:**	Duplicate

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units:___	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)

SEE NATIVE LOG

Comments:

INSPECTOR:_____

S://2002028/Shaw Purge log (2004)

LL

VOC

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-204	**SAMPLE ID:**	OU041045
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

			Approx. Unit Casing Vol.
A. Well Diameter:	inches		6″ diameter = 1.5 gal/ft
B. Unit Casing Volume:	gal/ft		4″ diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	ft		3″ diameter = 0.37 gal/ft
D. Well Design Depth:	ft		2″ diameter = 0.17 gal/ft
E. Sediment in Well (D – C)	ft		1″ diameter = 0.041 gal/ft
F. Static Water Level (TOC):	ft		
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

N/A

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ___ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: RICH BALDINO

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-204	**SAMPLE ID:**	OU041045
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1055	NA	NA	6.71	12.81	0.053	249	8.67	5.54	Clear - Brn

Comments: * Surface Water Sample

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL

VOC

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-205	**SAMPLE ID:**	OU041046
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

			Approx. Unit Casing Vol.
A. Well Diameter:	inches		6" diameter = 1.5 gal/ft
B. Unit Casing Volume:	gal/ft		4" diameter = 0.67 gal/ft
C. Total Well Depth (TOC):	ft		3" diameter = 0.37 gal/ft
D. Well Design Depth:	ft		2" diameter = 0.17 gal/ft
E. Sediment in Well (D – C)	ft		1" diameter = 0.041 gal/ft
F. Static Water Level (TOC):	ft		
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

N/A

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ___ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: RICH BALDINO

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-205	**SAMPLE ID:**	OU04 1045
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1150	NA	NA	6.67	13.05	0.053	252	9.11	7.83	Clear-Brn

Comments: * Surface Water Sample

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

LL

VOC

Well Pre-Sample Purging Record

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-206	**SAMPLE ID:**	OU041047
DATE:	4/14/05	**QC SAMPLE:**	Native

WELL DATA

A. Well Diameter:	inches		Approx. Unit Casing Vol.
B. Unit Casing Volume:	gal/ft		6" diameter = 1.5 gal/ft
C. Total Well Depth (TOC):	ft		4" diameter = 0.67 gal/ft
D. Well Design Depth:	ft		3" diameter = 0.37 gal/ft
E. Sediment in Well (D – C)	ft		2" diameter = 0.17 gal/ft
F. Static Water Level (TOC):	ft		1" diameter = 0.041 gal/ft
G. Water Column Height (C - F):	ft		
H. Well Volume (G x B)	gal		
I. Three Well Volumes (H x 3)	gal		

N/A

PURGING METHOD: ___ **Bailer** ___ **Pump Down/Recover** ___ **Low-flow***

(*CIRCLE ONE: peristaltic / bladder / Grundfos / Fultz)

PID MONITORING

Initial PID Reading (upon opening well cap in casing)

Date/Time (00:00)	PID (ppm)

BREATHING ZONE MONITORING

Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)	Date/Time (00:00)	PID (ppm)

INSPECTOR: RICH BALDINO

S://2002028/Shaw Purge log (2004)

Well Pre-Sample Purging Record
Continued

PROJECT NAME:	*Shaw AFB, Semi-annual Sampling*	**SITE:**	OU-4
WELL NAME:	SWS-206	**SAMPLE ID:**	OU041047
DATE:	4/14/05	**QC SAMPLE:**	Native

WATER QUALITY DATA

Date (2005)	Time (00:00)	DTW (feet)	Gallons Removed	pH	Temp (°C)	Sp. Cond. Units: mS/cm	ORP (mV)	DO (mg/L)	Turb. (NTUs)	Remarks (odor, color, clarity, etc.)
	1125	NA	NA	6.55	12.93	0.056	238.6	8.62	9.7	

Comments: * Surface Water Sample

INSPECTOR: [signature]

S://2002028/Shaw Purge log (2004)

APPENDIX B

QCSR, ANALYTICAL REPORTS FOR APRIL 2005

QUALITY CONTROL SUMMARY REPORT

Evaluation of Chemical Data from
Annual Groundwater Sampling Activities
OU-4
Shaw Air Force Base
Sumter, North Carolina
April 2005

Submitted To:
U.S. Army Corps of Engineers
Omaha District
106 South 15th Street
Omaha, Nebraska 68102-1618

Submitted By:
TN & Associates, Inc.
6404 Falls of the Neuse Road, Suite 102
Raleigh, North Carolina 27615

June 6, 2005

Quality Control Summary Report
Annual Groundwater Sampling Activities
OU-4
Shaw Air Force Base

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LIST OF ACRONYMS

ARAR	applicable or relevant and appropriate requirements
CCV	continuing calibration verification
CLP	contract laboratory program
CMS	corrective measures study
COC	chain of custody
DQO	Data Quality Objective
HCl	hydrochloric acid
LCS/LCD	Laboratory control sample/laboratory control duplicate
LTM	long-term monitoring
MDL	method detection limit
MS/MSD	matrix spike/matrix spike duplicate
NFG	National Functional Guidelines
OU-4	Operable Unit 4
PARCC	precision, accuracy, representativeness, completeness, and comparability
QA	quality assurance
QC	quality control
QAPP	Quality Assurance Project Plan
QCSR	Quality Control Summary Report
%R	percent recovery
RL	reporting limits
RPD	relative percent difference
RRF	relative response factor
SAFB	Shaw Air Force Base
SDG	sample delivery group
STL	Severn Trent Laboratories, Inc.
TN&A	T N & Associates, Inc.
µg/L	micrograms per liter
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1.0 EXECUTIVE SUMMARY

This Quality Control Summary Report (QCSR) is written by TN & Associates, Inc. (TN&A) for the chemical data collection activities performed at Shaw Air Force Base (SAFB), located in Sumter, South Carolina. The QCSR describes, in terms of the intended purpose, the quality and usability of chemical data generated during long-term monitoring (LTM) activities performed by TN&A.

Chemical data was generated from the annual sampling and analysis of groundwater samples collected from a well network at Operable Unit 4 (OU-4) April 14–20, 2005. Chemical data was also generated for surface water samples collected from Long Branch Creek.

Data validation for these activities evaluated the overall acceptability of the sampling results as reported by the subcontracted environmental laboratories. A calculation of percent completeness for the project is determined to be 100% usable data. No major data discrepancies were observed. Data for this reporting period is acceptable and usable for its intended use.

2.0 INTRODUCTION

2.1 Project Description

SAFB is an active U.S. Department of Defense installation located in northwest Sumter County, South Carolina, east of the city of Columbia, and covers 3,570 acres. Sumter County is located in the central portion of the state and is bounded on the north by Lee County, on the east by Florence County, on the south by Clarendon County, and on the west by Richland County.

The OU-4 area is in the northeast portion of SAFB and is a former fire training area. The site was identified under Air Combat Command's Environmental Restoration Program as Fire Training Area No. 1, based on the discovery of environmental impact and past practices at the site.

The site is partially wooded and extends into a low-lying area that borders Long Branch Creek, which flows southeastward.

Chemical data is collected from monitoring and compliance groundwater wells as well as one surface water body, Long Branch Creek, at OU-4 in order to assess the applicability of the data for the project decision-making process. The evaluation included the review of 61 field samples, 7 field duplicates, 4 equipment rinse blanks, and 4 trip blanks from the annual sampling event in April 2005.

2.2 Project Data Quality Objectives

Annual groundwater and surface water sampling and analysis are conducted with site-specific intended uses and data quality objectives (DQOs). The stated project DQOs for environmentally related measurements and data collected by TN&A provide data that are technically sound, scientifically and legally defensible, and of known, acceptable,

and documented quality for its intended use. This project has several general quality assurance (QA) objectives.

- Data generated will be of sufficient quality to withstand scientific and legal scrutiny.
- Data will be gathered or developed in accordance with procedures appropriate for their intended use.
- Data will be of known precision, accuracy, representativeness, completeness, and comparability (PARCC) within the limits of the scope of the project.
- Reporting limits for analytical methods will fall at or below applicable or relevant and appropriate requirements (ARARs) for all potential site contaminants.

To generate data that will meet the project objectives, it is necessary to define the types of decisions that will be made and identify the intended use of the data.

3.0 DATA QUALITY EVALUATION PROTOCOL

Before analytical data are released by the laboratory, the analyst and senior staff members review the data to ensure that method-specific requirements are met, that calculations are proper and correct, and that quality control (QC) parameters are within the specified limits. Any deficiencies identified in their review are described in the case narrative included in the analytical data package delivered to TN&A, which are reviewed during data evaluation.

After TN&A project staff receives the data packages, they are inventoried and reviewed according to matrix-specific protocols established for project-specific objectives. A detailed qualitative and quantitative review was conducted for the annual event groundwater and surface water samples. Qualitative and quantitative validation includes review of the following QC parameters when they are required by the analytical method being used.

- Case narrative, chain of custody (COC), and sample receipt forms
- Sample preservation, sample preparation/extraction and run logs, sample storage, and holding time
- Percent recovery (%R) of laboratory control sample/laboratory control duplicate (LCS/LCD), matrix spike/matrix spike duplicate (MS/MSD), surrogates, and internal standards
- Relative percent difference (RPD) of MS/MSD, laboratory duplicates, and field duplicates
- Method blanks, equipment blanks, trip blanks, ambient blanks, and calibration blanks
- Instrument and detector tuning, initial and continuing calibrations, and retention times
- Confirm that the correct method of analysis was performed as dictated by the project-specific Quality Assurance Project Plan (QAPP) and/or the project specific variances outlined at the start of the project.

- Confirm that the parameter specific reporting limits (RL) and all QC acceptance criteria conform to the project-specific QAPP and/or the project-specific variances outlined at the start of the project.

Data review and validation was performed to meet the data quality objectives using method-specific requirements and project specific validation guidelines. For this project, analytical methods for water were taken from U.S. Environmental Protection Agency (USEPA) SW-846, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Third Edition, November 1986, and its updates (hereafter referred as SW-846). Data validation guidelines were taken from the USEPA Contract Laboratory Program (CLP) National Functional Guidelines (NFG) for Organic Data Review (EPA-540/R-99-008, October 1999) and "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," Third Edition, November 1986, and its updates.

During the validation process, qualifying flags were appended to analytical results whenever problems with sampling or analysis may have compromised the integrity of those results. The following are qualifying flags used during validation:

[none]	The parameter was detected at the reported concentration value.
J	Results are estimates only. The parameter was detected, but the reported value may not be accurate or precise.
UJ	Results are estimates only. The parameter was not detected, but the RL may not be accurate or precise.
U	Parameter was not detected. The reported value is the practical RL.
R	Rejected results (not usable). The parameter may or may not be present. This flag is also used to identify the un-preferred result selected from multiple analyses.

As per NFG, sample results below RLs but above method detection limits (MDLs) are qualified as estimated (J) unless other factors (such as blank contamination) cause the result to be qualified as non-detect or rejected.

The findings of the review are organized by the laboratory sample delivery group (SDG) for each analysis and are presented in the following sections. No major deficiencies were noted. Minor deficiencies are described in the text.

4.0 LABORATORIES

All samples were submitted to and analyzed by Severn Trent Laboratories, Inc. (STL) in University Park, Illinois. The Environmental Chemistry Branch in Omaha, Nebraska performed QA split sample analysis at an approximate frequency of 1 per 10 field samples. Laboratory contact information is shown in Table 1.

TABLE 1
Laboratory Contact Information
(SAFB – Quality Control Summary Report)

Primary Laboratory	QC Laboratory
Severn Trent Laboratories, Inc. (STL)	Chemistry Quality Assurance Branch Laboratory
2417 Bond Street	420 South 18th Street
University Park, IL 60466	Omaha, NE 68102-2501
Phone: (708) 534-5200	Phone: (402) 444-4314

5.0 CHAIN-OF-CUSTODY RECORD

COC records were reviewed for completeness (sampler, relinquish, and receipt) and for laboratory notes concerning receipt of the samples. No discrepancies were noted.

6.0 PRESERVATION

Cooler/sample receipt forms were reviewed to determine if the samples were correctly preserved and if sample integrity had been maintained during shipment. Table 2 lists the appropriate sample containers and preservation requirements.

7.0 REQUESTED ANALYSIS

Requested analyses identified on the COC records were compared to the laboratory reports for each sample to determine if all analyses had been performed by the laboratory. The laboratory performed all requested analyses. No discrepancies were noted.

Table 2 lists the required analyses, methods, and holding times for the samples reviewed for this report.

TABLE 2
Required Analyses, Containers, Preservatives, and Holding Times
(SAFB – Quality Control Summary Report)

Analysis	Methods	Bottle Type and Quantity	Preservation	Project Holding Time
VOC	SW846 Methods 5030/8260B	3 - 40 milliliter, VOA vials with Teflon-lined seal	HCl to pH<2, Cool (4°C)	14 days to preparation and analysis
Methane, Ethane, Ethene	Method RSK-175	3 - 40 milliliter, VOA vials	HCl to pH<2, Cool (4°C)	14 days

8.0 DETECTION LIMITS

The MDL represents the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than

zero and is determined from analysis of a sample for a given matrix. The laboratory RL is the minimum level at which the laboratory can detect the compound and quantify the concentration without it being estimated.

9.0 MONITORING WELL AND SURFACE WATER DATA

Aqueous environmental samples were collected by TN&A personnel from April 14–20, 2005. This project utilized both field and analytical laboratory QC measures to ensure that the data quality objectives were met. The quality of the analytical data was evaluated according to project-specific QA guidelines.

TN&A collected aqueous environmental samples at 42 unique field locations. A summary of the samples collected by site is shown in Table 3.

TABLE 3
Sample Summary
(SAFB – Quality Control Summary Report)

Analysis	Field Samples	Field Duplicates	Field Replicates	Equipment Blanks	Trip Blanks
VOCs	42	5	5	2	4
Methane, Ethane, Ethene	19	2	0	2	0

10.0 VOLATILE ORGANIC COMPOUNDS (VOCs)

Groundwater samples collected during the April 2005 sampling event were submitted for chemical testing of VOCs by SW-846 Method 5030B/8260B. VOC samples were preserved with hydrochloric acid (HCl). TN&A collected 42 field samples for VOC analysis. Five field duplicate samples, five field replicate samples, two equipment blank samples, and four trip blank samples were also collected for QC purposes. STL produced three analytical data packages for VOCs including SDG numbers 235828, 235857, and 235920.

SDG 235828

SDG 235828 consisted of 15 field samples, 3 field duplicate samples, 1 equipment blank, and 1 trip blank sample. Samples for this SDG were collected on April 14, 2005. The shipping container (cooler) temperature was 3.6 degrees Celsius.

All samples were extracted and analyzed within holding time criteria.

Surrogate recoveries were within the laboratory established QC limits.

MS/MSD analyses were performed on sample OU041018 (C-12). The RPD between MS and MSD analyses for 2-butanone was high at 31% (limit 20%). No action was taken for high RPD of 2-butanone since its MS/MSD recoveries were within QC limits of 29-139%.

LCS/LCD analysis was performed for every sample batch. 1,1-Dichloropropene was outside the QC limits of 70-125% for low recovery (69%) in the LCS associated with Batch 147485. 2,2-Dichloropropane and 1,1-dichloropropene were outside QC limits for low recoveries (67%/67%, respectively) in the LCD associated with Batch 147485. All RPDs were within QC limits. Both compounds were non-detect in the affected sample results; therefore, no action was taken to qualify the deficiencies.

One trip blank (OU041060), one equipment blank (OU041050), and one laboratory method blank (147484-027) were used to determine blank contamination. Toluene was detected in the equipment blank below the RL, but above the MDL. The action level for toluene detected at 0.64 μg/L is 3.5 μg/L. Toluene was detected in sample OU041014 at 0.79 μg/L. The result was below the action limit; therefore, the compound was qualified as non-detect and flagged "U". Since the detection was less than the RL, but above the MDL, the result was brought up to the RL of 1.0 μg/L.

Three field duplicates were collected for this SDG. Sample pairs including OU041027/OU041028, OU041030/OU041031, and OU041043/OU041044 were within QC limits of less than 20% RPD.

The initial calibration began on March 24, 2005 at 1350. All target compounds were within QC limits. Two compounds, bromomethane and carbon disulfide, were outside QC limits for high %D in the continuing calibration ran on March 28, 2005 at 0742. Acetone was outside QC limits for low relative response factor (RRF). All samples were affected by these deficiencies. Acetone was qualified as estimated and flagged "J" in every sample.

All internal standard area counts and retention times were compliant.

SDG 235857

SDG 235857 consisted of 13 field samples, 2 field duplicate samples, 1 trip blank sample, and 1 equipment blank sample. Samples for this SDG were collected on April 14–15, 2005. The shipping container (cooler) temperature was 2.4 degrees Celsius.

All samples were extracted and analyzed within holding time criteria.

Surrogate recoveries were within the laboratory established QC limits.

MS/MSD analyses were requested and performed on sample OU041033. Six compounds including cis-1,2-dichloroethene, ethylbenzene, m,p-xylenes, total xylenes, 1,2,4-trimethylbenzene, and toluene were outside QC limits for high MS and/or MSD recoveries. One compound, acetone, was outside QC limits for %RPD; however, no action was taken to qualify the deficiency since the recoveries for acetone were within QC limits. Cis-1,2-dichloroethene, ethylbenzene, total xylenes, 1,2,4-trimethylbenzene, m,p-xylenes, and toluene were detected in sample OU041033; therefore, the results were qualified as estimated and flagged "J" due to high recoveries.

LCS/LCD analyses were performed for every sample batch. The RPDs between LCS and LCD analyses associated with Batch 147139 were high for three compounds including

acetone, 2,2-dichloropropane, and 2-butanone. The RPDs between LCS and LCD analyses associated with Batch 147234 were high for one compound, bromomethane. No action is taken for RPDs outside QC limits when LCS/LCD recoveries are acceptable.

One trip blank (OU041061), one equipment blank (OU041051), and two laboratory method blanks (147084-027 and 147223-026) were used to determine blank contamination. Methylene chloride was detected in the trip blank sample OU041061 at 6.1 μg/L. The action level for methylene chloride is 61.0 μg/L. Methylene chloride was detected in sample OU041001 at 1.5 μg/L, and in sample OU041004 at 1.6 μg/L. The results were below the action limit; therefore, the compound was qualified as non-detect and flagged "U" due to possible contamination from sample handling.

Two field duplicate pairs were collected for this SDG including samples OU041004/OU041005 and OU041016/OU041017. All results were within 20% RPD.

All compounds were within QC limits for the initial calibration. Two compounds, dichlorofluoromethane and methylene chloride, were outside QC limits for high %D in the continuing calibration ran on April 25, 2005 at 1104. Carbon disulfide was also outside QC limits for high %D in the continuing calibration ran on April 26, 2005 at 1725. No affected compounds were qualified since they were not detected in any sample.

All internal standard area counts and retention times were compliant.

SDG 235920

SDG 235920 consisted of 14 field samples and 2 trip blank samples. Samples for this SDG were collected on April 19–20, 2005. The shipping container (cooler) temperature was 2.3 degrees Celsius.

All samples were extracted and analyzed within holding time criteria.

Surrogate recoveries were within the laboratory established QC limits.

MS/MSD analyses were performed on sample OU041062. TN&A did not request that this sample be run for MS/MSD since it was a trip blank sample. One compound, bromomethane, was outside QC limits for high RPD (25%, limit 20%). No action was taken to qualify the deficiency since the recoveries were within QC limits.

LCS/LCD analyses were performed for every sample batch. Two compounds including bromomethane and acetone were outside QC limits for %RPD. However, no action was taken since the recoveries were within QC limits. Three compounds including chloroethane, carbon disulfide, and trans-1,2-dichloroethene were outside QC limits for recoveries in the LCD associated with Batch 147690. Chloroethane was qualified as estimated and flagged "J" in samples OU041000, OU041002, OU041003, OU041007, OU041010, OU041012, OU041015, and OU041020. Carbon disulfide and trans-1,2-dichloroethene were not detected in the affected sample(s); therefore, no action was taken.

Two trip blanks (OU041062 and OU041063) and three laboratory method blanks were used to determine blank contamination. Methylene chloride was detected in OU041063 at 4.7 μg/L. The action level for methylene chloride is 47.0 μg/L. Methylene chloride was not detected in any sample.

Field duplicate samples were not included in this SDG.

Bromoform was outside QC limits for high %RSD in the initial calibration ran on April 25, 2005 at 18:45. Bromoform was not detected in any affected sample; therefore, no action was taken to qualify the deficiency. Fifteen compounds were outside QC limits for high %D in the continuing calibration ran on 4/29/05 at 1256. Naphthalene was detected in samples OU041002, OU041003, OU041007, OU041010, OU041012, and OU041015. Results were qualified as estimated and flagged "J". Acetone was outside QC limits for low RRF in the continuing calibration ran on May 3, 2005 at 09:58. The result in sample OU041019 was qualified as estimated and flagged "J". Acetone and 2-butanone were outside QC limits for low RRF and high %D in the continuing calibration ran on May 2, 2005 at 20:47. Acetone and 2-butanone were qualified as estimated and flagged "J" in samples OU041035, OU041021, OU041022, OU041023, and OU041026. Trip blanks were not qualified for calibration deficiencies.

All internal standard area counts and retention times were compliant.

11.0 METHANE, ETHANE, AND ETHENE

A subset of the groundwater samples collected during the April 2005 sampling event were submitted for chemical testing of gases (methane, ethane, and ethene) by method RSK-175. TN&A collected 19 field samples for methane, ethane, and ethene analysis. Two field duplicate samples and two equipment blank samples were also collected for QC purposes. STL produced three analytical data packages including SDG numbers 235831, 235858, and 235921.

SDG 235831

SDG 235831 consisted of three field samples, one field duplicate sample, and one equipment blank. All samples for this SDG were collected on April 14, 2005. The shipping container (cooler) temperature was 2.0 degrees Celsius.

All samples were extracted and analyzed within the recommended method holding time.

One laboratory method blank and one equipment blank were used to determine blank contamination. The method blank was non-detect for methane, ethane, and ethene. However, methane was detected in the equipment blank at 0.72 μg/L. The action level for qualifying the deficiency is 3.6 μg/L. Methane was detected in sample OU041027 at 0.61 μg/L, and in sample OU041028 at 1.1 μg/L. Since the detections were less than the action level, the results were qualified as non-detect and flagged "U".

MS/MSD analyses were requested and performed on sample OU041018. Ethene had high MS and MSD recoveries (above 125%). The result for ethene was qualified as estimated and flagged "J" in sample OU041018. Since the result for methane was high, the percent recoveries were not calculated because the sample amount was greater than four times the spike amount (methane was out of the detector's range). No additional action was taken.

The LCS for methane, ethane, and ethene was within the laboratory established recovery limits. No deficiencies were noted.

One field duplicate sample, OU041028, was collected and including in this SDG. The sample was compared to its native sample, OU041027. The RPDs for methane, ethane, and ethane in the native/field duplicate sample set were within QC limits.

The continuing calibration verification (CCV) ran on May 2, 2005 at 0409 was outside QC limits of 90-110% for ethane (marginally low at 87.79%). Since the recovery was marginally low, no action was taken to qualify the deficiency. All other CCVs were within QC limits.

SDG 235858

SDG 235858 consisted of four field samples, one field sample, and one equipment blank. All samples for this SDG were collected on April 15, 2005. The shipping container (cooler) temperature was 2.0 degrees Celsius.

All samples were extracted and analyzed within the recommended method holding time.

One laboratory method blank and one equipment blank were used to determine blank contamination. The method blank was non-detect for methane, ethane, and ethene. Methane was detected in the equipment blank (OU041051) at 0.45 μg/L J. The action level for qualifying the deficiency is 2.25 μg/L. Methane was detected in sample OU041024 at 0.95 μg/L, and in sample OU041034 at 1.8 μg/L. Since the detections were less than the action level, the results were qualified as non-detect and flagged "U".

An MS/MSD was not requested and for this SDG.

The LCS and LCD for methane, ethane, and ethene were within limits (70-130%). The RPD between the LCS and LCD were below 30%. No deficiencies were noted.

Positive results for methane, ethane, and ethene were calculated for RPD in sample/duplicate set OU041016/OU041017. The RPDs for methane, ethane, and ethane in the native/field duplicate sample set were less than 20%. No deficiencies were noted.

The CCV ran on 5/2/2005 at 0409 was outside QC limits of 90-110% for ethane (marginally low at 87.79%). Since the recovery was marginally low, no action was taken to qualify the deficiency. All other CCVs were within QC limits.

SDG 235921

SDG 235921 consisted of 12 field samples. No field duplicate samples were collected for this SDG. All samples for this SDG were collected on April 19–20, 2005. The shipping container (cooler) temperature was 3.0 degrees Celsius.

OU041019 and OU041020 were originally analyzed within holding time and reanalyzed within a day out of holding time at a dilution to get methane within the calibration range for RSK-175. Methane, ethane, and ethene were qualified as estimated and flagged "J" in both samples.

The method blank was free of detects for methane, ethane, and ethene. No field blank samples were included with this SDG.

An MS/MSD was not requested and for this SDG.

The LCS and LCD for methane, ethane, and ethene were within limits (70-130%). The RPD between the LCS and LCD were below 30%. No deficiencies were noted.

Field duplicate samples were not included in this SDG.

The CCVs were within QC limits of 90-110% for all compounds. The %RSDs for the initial calibration were less than 15%. No deficiencies were noted.

12.0 COMPLETENESS

For the annual sampling event, a total of 42 samples were collected for VOC analysis and a total of 19 samples were collected for methane, ethane, and ethene analysis. Five field duplicate samples were collected for VOC analysis and two field duplicate sample was collected for methane, ethane, and ethene analysis. Two equipment blanks and four trip blanks were collected for VOC analysis. Two equipment blank samples were collected for methane, ethane, and ethene analyses. Five QA split samples were collected for VOC analysis.

Of the 42 VOC samples, 66 analytes were reported for each sample, for a total of 2,772 results. Of the 2,772 results, zero compounds were rejected. Of the 2,772 results reported by the laboratory, 2,772 are usable as reported for a completeness of 100 percent.

Of the 19 methane, ethane, and ethene samples, 3 results were reported per sample for a total of 57 results. Of the 57 results, zero compounds were rejected. Of the 57 results reported by the laboratory, 57 are usable as reported for a completeness of 100 percent.

MW-1

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041029
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:15
Sample Matrix.....: Water

Laboratory Sample ID: 235828-7
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	50	U		6.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Chloromethane	50	U		10	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Vinyl chloride	49	J		8.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Bromomethane	50	U		30	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Chloroethane	100			16	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Trichlorofluoromethane	50	U		7.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,1-Dichloroethene	28	J		12	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Carbon disulfide	250	U		7.5	250	50.0000	ug/L	147485		04/28/05 1015	jdn
	Acetone	1500		J	70	250	50.0000	ug/L	147485		04/28/05 1015	jdn
	Methylene chloride	50	U		12	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	trans-1,2-Dichloroethene	50	U		14	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Methyl-tert-butyl-ether (MTBE)	50	U		10	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,1-Dichloroethane	340			7.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	2,2-Dichloropropane	50	U		8.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	cis-1,2-Dichloroethene	66			10	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	2-Butanone (MEK)	250	U		50	250	50.0000	ug/L	147485		04/28/05 1015	jdn
	Bromochloromethane	50	U		14	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Chloroform	50	U		7.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,1,1-Trichloroethane	430			8.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,1-Dichloropropene	50	U		19	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Carbon tetrachloride	50	U		17	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Benzene	50	U		12	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2-Dichloroethane	50	U		12	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Trichloroethene	50	U		6.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2-Dichloropropane	50	U		9.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Dibromomethane	50	U		10	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Bromodichloromethane	50	U		11	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	cis-1,3-Dichloropropene	50	U		7.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn

* In Description = Dry Wgt.

azw
5-11-05

MW-1

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041029
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:15
Sample Matrix.....: Water

Laboratory Sample ID: 235828-7
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	250	U		46	250	50.0000	ug/L	147485		04/28/05 1015	jdn
	Toluene	50	U		9.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	trans-1,3-Dichloropropene	50	U		8.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,1,2-Trichloroethane	50	U		12	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Tetrachloroethene	50	U		9.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,3-Dichloropropane	50	U		11	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	2-Hexanone	250	U		50	250	50.0000	ug/L	147485		04/28/05 1015	jdn
	Dibromochloromethane	50	U		11	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2-Dibromoethane (EDB)	50	U		16	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Chlorobenzene	50	U		7.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,1,1,2-Tetrachloroethane	50	U		16	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Ethylbenzene	50	U		10	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	m&p-Xylenes	68	J		18	100	50.0000	ug/L	147485		04/28/05 1015	jdn
	o-Xylene	34	J		9.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Styrene	50	U		9.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Bromoform	50	U		16	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Isopropylbenzene	50	U		10	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Bromobenzene	50	U		11	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,1,2,2-Tetrachloroethane	50	U		17	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2,3-Trichloropropane	50	U		18	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	n-Propylbenzene	50	U		8.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	2-Chlorotoluene	50	U		8.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,3,5-Trimethylbenzene	62			9.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	4-Chlorotoluene	50	U		9.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	tert-Butylbenzene	50	U		8.0	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2,4-Trimethylbenzene	82			13	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	sec-Butylbenzene	50	U		9.5	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,3-Dichlorobenzene	50	U		10	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	p-Isopropyltoluene	50	U		14	50	50.0000	ug/L	147485		04/28/05 1015	jdn

* In Description = Dry Wgt.

a20
5-11-05

MW-1

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041029
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:15
Sample Matrix.....: Water

Laboratory Sample ID: 235828-7
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	50	U		12	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	n-Butylbenzene	50	U		18	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2-Dichlorobenzene	50	U		14	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2-Dibromo-3-chloropropane	50	U		20	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2,4-Trichlorobenzene	50	U		18	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Hexachlorobutadiene	50	U		18	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Naphthalene	50	U		18	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	1,2,3-Trichlorobenzene	50	U		22	50	50.0000	ug/L	147485		04/28/05 1015	jdn
	Xylenes (total)	110			27	100	50.0000	ug/L	147485		04/28/05 1015	jdn

* In Description = Dry Wgt.

aw
5-11-05

MW-105

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041030
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-8
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
82608	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	cis-1,2-Dichloroethene	0.85	J		0.20	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn

* In Description = Dry Wgt.

ajw 5-11-05

MW -105

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041030
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-8
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn

* In Description = Dry Wgt.

aw 5-11-05

MW -105

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041030
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-8
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1354	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1354	jdn

* In Description = Dry Wgt.

aw 5-11-05

FD of MW-105

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041031
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-21
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	cis-1,2-Dichloroethene	0.53	J		0.20	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn

* In Description = Dry Wgt.

aw 5-11-05

FD of MW-105

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041031
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-21
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn

* In Description = Dry Wgt.

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5-11-05

FD of MW-105

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041031
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-21
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1816	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1816	jdn

* In Description = Dry Wgt.

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5-11-05

MW-112

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041032
Date Sampled.....: 04/15/2005
Time Sampled.....: 11:45
Sample Matrix.....: Water

Laboratory Sample ID: 235857-11
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	cis-1,2-Dichloroethene	0.75	J		0.20	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Benzene	1.5			0.23	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk

* In Description = Dry Wgt.

AW
5-12-05

MW-112

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041032
Date Sampled.....: 04/15/2005
Time Sampled.....: 11:45
Sample Matrix.....: Water

Laboratory Sample ID: 235857-11
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Toluene	3.0			0.18	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Ethylbenzene	170			2.1	10	10.0000	ug/L	147234	D1	04/26/05 2314	mjk
	m&p-Xylenes	540			3.6	20	10.0000	ug/L	147234	D1	04/26/05 2314	mjk
	o-Xylene	3.5			0.19	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Isopropylbenzene	17			0.20	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	n-Propylbenzene	25			0.16	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,3,5-Trimethylbenzene	86			0.18	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2,4-Trimethylbenzene	270			2.6	10	10.0000	ug/L	147234	D1	04/26/05 2314	mjk
	sec-Butylbenzene	4.1			0.19	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	p-Isopropyltoluene	5.8			0.29	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk

* In Description = Dry Wgt.

aw 5-12-05

MW-112

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041032
Date Sampled.....: 04/15/2005
Time Sampled.....: 11:45
Sample Matrix.....: Water

Laboratory Sample ID: 235857-11
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Naphthalene	60			0.37	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 2252	mjk
	Xylenes (total)	560			5.4	20	10.0000	ug/L	147234	D1	04/26/05 2314	mjk

* In Description = Dry Wgt.

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5-12-05

MW-114

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041033
Date Sampled.....: 04/14/2005
Time Sampled.....: 15:55
Sample Matrix.....: Water

Laboratory Sample ID: 235857-17
Date Received.....: 04/15/2005
Time Received.....: 09:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Chloroethane	1.1			0.32	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,1-Dichloroethane	4.2			0.15	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	cis-1,2-Dichloroethene	280		J	1.0	5.0	5.00000	ug/L	147234	D1	04/27/05 0252	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Benzene	2.8			0.23	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk

* In Description = Dry Wgt.

aw 5/12/05

MW -114

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041033
Date Sampled.....: 04/14/2005
Time Sampled.....: 15:55
Sample Matrix.....: Water

Laboratory Sample ID: 235857-17
Date Received.....: 04/15/2005
Time Received.....: 09:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Toluene	29		J	0.18	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Ethylbenzene	42		J	0.21	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	m&p-Xylenes	100		J	0.36	2.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	o-Xylene	30			0.19	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Isopropylbenzene	5.3			0.20	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	n-Propylbenzene	7.0			0.16	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,3,5-Trimethylbenzene	13			0.18	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2,4-Trimethylbenzene	50		J	0.26	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	sec-Butylbenzene	1.1			0.19	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk

* In Description = Dry Wgt.

ajw 5-12-05

MW-114

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041033
Date Sampled.....: 04/14/2005
Time Sampled.....: 15:55
Sample Matrix.....: Water

Laboratory Sample ID: 235857-17
Date Received.....: 04/15/2005
Time Received.....: 09:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Naphthalene	16			0.37	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/27/05 0146	mjk
	Xylenes (total)	140		J	0.54	2.0	1.00000	ug/L	147234		04/27/05 0146	mjk

* In Description = Dry Wgt.

aw
5-12-05

MW-115A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041034
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:25
Sample Matrix.....: Water

Laboratory Sample ID: 235857-12
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk

* In Description = Dry Wgt.

aw 5-12-05

MW-115A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB DU-04 ATTN: Keely Meadows

Customer Sample ID: OU041034
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:25
Sample Matrix.....: Water

Laboratory Sample ID: 235857-12
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk

* In Description = Dry Wgt.

aw 5-12-05

MW-115A

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041034
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:25
Sample Matrix.....: Water

Laboratory Sample ID: 235857-12
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 2336	mjk
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147234		04/26/05 2336	mjk

* In Description = Dry Wgt.

aw
5-12-05

MW-117

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041035
Date Sampled.....: 04/19/2005
Time Sampled.....: 16:15
Sample Matrix.....: Water

Laboratory Sample ID: 235920-10
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	2.0	U		0.24	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Chloromethane	2.0	U		0.40	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Vinyl chloride	54			0.32	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Bromomethane	2.0	U		1.2	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Chloroethane	490			3.2	10	10.0000	ug/L	147667	D1	05/03/05 0047	jdn
	Trichlorofluoromethane	2.0	U		0.28	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,1-Dichloroethene	37			0.50	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Carbon disulfide	10	U		0.30	10	2.00000	ug/L	147667		05/03/05 0025	jdn
	Acetone	10	U	J	2.8	10	2.00000	ug/L	147667		05/03/05 0025	jdn
	Methylene chloride	2.0	U		0.48	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	trans-1,2-Dichloroethene	2.4			0.58	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Methyl-tert-butyl-ether (MTBE)	2.0	U		0.42	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,1-Dichloroethane	700			1.5	10	10.0000	ug/L	147667	D1	05/03/05 0047	jdn
	2,2-Dichloropropane	2.0	U		0.34	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	cis-1,2-Dichloroethene	370			2.0	10	10.0000	ug/L	147667	D1	05/03/05 0047	jdn
	2-Butanone (MEK)	10	U	J	2.0	10	2.00000	ug/L	147667		05/03/05 0025	jdn
	Bromochloromethane	2.0	U		0.54	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Chloroform	2.0	U		0.28	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,1,1-Trichloroethane	280			1.7	10	10.0000	ug/L	147667	D1	05/03/05 0047	jdn
	1,1-Dichloropropene	2.0	U		0.76	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Carbon tetrachloride	2.0	U		0.68	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Benzene	6.9			0.46	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2-Dichloroethane	2.0	U		0.50	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Trichloroethene	2.0	U		0.26	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2-Dichloropropane	2.0	U		0.38	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Dibromomethane	2.0	U		0.42	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Bromodichloromethane	2.0	U		0.44	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	cis-1,3-Dichloropropene	2.0	U		0.30	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn

* In Description = Dry Wgt.

aZW
5-16-05

MW-117

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235920

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041035
Date Sampled.....: 04/19/2005
Time Sampled.....: 16:15
Sample Matrix.....: Water

Laboratory Sample ID: 235920-10
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	10	U		1.8	10	2.00000	ug/L	147667		05/03/05 0025	jdn
	Toluene	180			0.36	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	trans-1,3-Dichloropropene	2.0	U		0.32	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,1,2-Trichloroethane	2.0	U		0.48	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Tetrachloroethene	2.0	U		0.36	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,3-Dichloropropane	2.0	U		0.44	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	2-Hexanone	10	U		2.0	10	2.00000	ug/L	147667		05/03/05 0025	jdn
	Dibromochloromethane	2.0	U		0.44	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2-Dibromoethane (EDB)	2.0	U		0.66	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Chlorobenzene	2.0	U		0.30	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,1,1,2-Tetrachloroethane	2.0	U		0.66	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Ethylbenzene	35			0.42	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	m&p-Xylenes	92			0.72	4.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	o-Xylene	45			0.38	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Styrene	2.0	U		0.36	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Bromoform	2.0	U		0.64	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Isopropylbenzene	3.0			0.40	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Bromobenzene	2.0	U		0.44	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,1,2,2-Tetrachloroethane	2.0	U		0.68	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2,3-Trichloropropane	2.0	U		0.70	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	n-Propylbenzene	4.8			0.32	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	2-Chlorotoluene	2.0	U		0.32	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,3,5-Trimethylbenzene	6.1			0.36	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	4-Chlorotoluene	2.0	U		0.36	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	tert-Butylbenzene	2.0	U		0.32	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2,4-Trimethylbenzene	26			0.52	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	sec-Butylbenzene	2.0	U		0.38	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,3-Dichlorobenzene	2.0	U		0.42	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	p-Isopropyltoluene	10			0.58	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn

* In Description = Dry Wgt.

aw 5-16-05

MW-117

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041035
Date Sampled.....: 04/19/2005
Time Sampled.....: 16:15
Sample Matrix.....: Water

Laboratory Sample ID: 235920-10
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	7.0			0.50	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	n-Butylbenzene	2.0	U		0.70	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2-Dichlorobenzene	12			0.58	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2-Dibromo-3-chloropropane	2.0	U		0.82	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2,4-Trichlorobenzene	2.0	U		0.72	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Hexachlorobutadiene	2.0	U		0.72	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Naphthalene	18			0.74	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	1,2,3-Trichlorobenzene	2.0	U		0.86	2.0	2.00000	ug/L	147667		05/03/05 0025	jdn
	Xylenes (total)	140			1.1	4.0	2.00000	ug/L	147667		05/03/05 0025	jdn

* In Description = Dry Wgt.

QW 5-16-05

MW-118

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041036
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235828-10
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn

* In Description = Dry Wgt.

aw 5-11-05

MW-118

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041036
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235828-10
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn

* In Description = Dry Wgt.

aw 5-11-05

MW-118

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041036
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235828-10
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1416	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1416	jdn

* In Description = Dry Wgt.

aZW
5-11-05

MW-12ZA

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041038
Date Sampled.....: 04/15/2005
Time Sampled.....: 10:15
Sample Matrix.....: Water

Laboratory Sample ID: 235857-13
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,1-Dichloroethane	1.8			0.15	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	cis-1,2-Dichloroethene	260			2.0	10	10.0000	ug/L	147234	D1	04/27/05 0019	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Benzene	170			2.3	10	10.0000	ug/L	147234	D1	04/27/05 0019	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk

* In Description = Dry Wgt.

aw
5-12-05

MW-122A

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041038
Date Sampled.....: 04/15/2005
Time Sampled.....: 10:15
Sample Matrix.....: Water

Laboratory Sample ID: 235857-13
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Toluene	8.7			0.18	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Ethylbenzene	150			2.1	10	10.0000	ug/L	147234	D1	04/27/05 0019	mjk
	m&p-Xylenes	530			3.6	20	10.0000	ug/L	147234	D1	04/27/05 0019	mjk
	o-Xylene	18			0.19	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Isopropylbenzene	10			0.20	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	n-Propylbenzene	11			0.16	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,3,5-Trimethylbenzene	40			0.18	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	tert-Butylbenzene	1.2			0.16	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,2,4-Trimethylbenzene	98			0.26	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	p-Isopropyltoluene	2.8			0.29	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk

* In Description = Dry Wgt.

aw
5-12-05

MW-122A

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041038
Date Sampled.....: 04/15/2005
Time Sampled.....: 10:15
Sample Matrix.....: Water

Laboratory Sample ID: 235857-13
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,2-Dichlorobenzene	1.1			0.29	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Naphthalene	42			0.37	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 2357	mjk
	Xylenes (total)	550			5.4	20	10.0000	ug/L	147234	D1	04/27/05 0019	mjk

* In Description = Dry Wgt.

aw
5-12-05

PZ-101

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041039
Date Sampled.....: 04/15/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235857-14
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk

* In Description = Dry Wgt.

aw
5-12-05

PZ-101

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-D4 ATTN: Keety Meadows

Customer Sample ID: OU041039
Date Sampled.....: 04/15/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235857-14
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk

* In Description = Dry Wgt.

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5-12-05

PZ-101

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041039
Date Sampled.....: 04/15/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235857-14
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/27/05 0041	mjk
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147234		04/27/05 0041	mjk

* In Description = Dry Wgt.

QW 5-12-05

PZ-103

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041040
Date Sampled.....: 04/14/2005
Time Sampled.....: 16:05
Sample Matrix.....: Water

Laboratory Sample ID: 235828-11
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn

* In Description = Dry Wgt.

aw 5-11-05

PZ-103

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041040
Date Sampled.....: 04/14/2005
Time Sampled.....: 16:05
Sample Matrix.....: Water

Laboratory Sample ID: 235828-11
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn

* In Description = Dry Wgt.

ATO 5-11-05

PZ-103

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041040
Date Sampled.....: 04/14/2005
Time Sampled.....: 16:05
Sample Matrix.....: Water

Laboratory Sample ID: 235828-11
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1438	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1438	jdn

* In Description = Dry Wgt.

azw
5-11-05

C-1

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041000
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-1
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Vinyl chloride	90			0.16	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Chloroethane	520		J	3.2	10	10.0000	ug/L	147690	D1	04/29/05 1625	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,1-Dichloroethene	19			0.25	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,1-Dichloroethane	260			1.5	10	10.0000	ug/L	147690	D1	04/29/05 1625	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	cis-1,2-Dichloroethene	95			0.20	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,1,1-Trichloroethane	26			0.17	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Benzene	13			0.23	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Trichloroethene	4.5			0.13	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-1

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041000
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-1
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Tetrachloroethene	2.6			0.18	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Isopropylbenzene	1.2			0.20	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-1

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041000
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-1
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	4.2			0.25	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2-Dichlorobenzene	6.8			0.29	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147690		04/29/05 1600	mjk
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147690		04/29/05 1600	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-2A

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041001
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:05
Sample Matrix.....: Water

Laboratory Sample ID: 235857-1
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Vinyl chloride	6.4			0.16	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Chloroethane	95			0.32	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,1-Dichloroethene	13			0.25	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Methylene chloride	1.5	U	u	0.24	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,1-Dichloroethane	270			0.75	5.0	5.00000	ug/L	147139	D1	04/25/05 2053	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	cis-1,2-Dichloroethene	58			0.20	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Benzene	2.4			0.23	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn

* In Description = Dry Wgt.

QW 5-12-05

C-2A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041001
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:05
Sample Matrix.....: Water

Laboratory Sample ID: 235857-1
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Toluene	19			0.18	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Ethylbenzene	2.4			0.21	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	m&p-Xylenes	7.7			0.36	2.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	o-Xylene	4.1			0.19	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2,4-Trimethylbenzene	1.5			0.26	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn

* In Description = Dry Wgt.

aZW
5-12-05

C-2A

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-D4 ATTN: Keely Meadows

Customer Sample ID: OU041001
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:05
Sample Matrix.....: Water

Laboratory Sample ID: 235857-1
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147139		04/25/05 2031	jdn
	Xylenes (total)	12			0.54	2.0	1.00000	ug/L	147139		04/25/05 2031	jdn

* In Description = Dry Wgt.

aw 5-12-05

C-3A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-D4 ATTN: Keely Meadows

Customer Sample ID: OU041002
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:45
Sample Matrix.....: Water

Laboratory Sample ID: 235920-2
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	20	U		2.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Chloromethane	20	U		4.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Vinyl chloride	340			3.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Bromomethane	20	U		12	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Chloroethane	20000		*J	64	200	200.000	ug/L	147690	D1	04/29/05 1714	mjk
	Trichlorofluoromethane	20	U		2.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,1-Dichloroethene	30			5.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Carbon disulfide	100	U	*	3.0	100	20.0000	ug/L	147690		04/29/05 1649	mjk
	Acetone	100	U		28	100	20.0000	ug/L	147690		04/29/05 1649	mjk
	Methylene chloride	20	U		4.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	trans-1,2-Dichloroethene	20	U	*	5.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Methyl-tert-butyl-ether (MTBE)	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,1-Dichloroethane	220			3.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	2,2-Dichloropropane	20	U		3.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	cis-1,2-Dichloroethene	250			4.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	2-Butanone (MEK)	100	U		20	100	20.0000	ug/L	147690		04/29/05 1649	mjk
	Bromochloromethane	20	U		5.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Chloroform	20	U		2.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,1,1-Trichloroethane	20	U		3.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,1-Dichloropropene	20	U		7.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Carbon tetrachloride	20	U		6.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Benzene	160			4.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2-Dichloroethane	20	U		5.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Trichloroethene	20	U		2.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2-Dichloropropane	20	U		3.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Dibromomethane	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Bromodichloromethane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	cis-1,3-Dichloropropene	20	U		3.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk

* In Description = Dry Wgt.

aw 5-16-05

C-3A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041002
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:45
Sample Matrix.....: Water

Laboratory Sample ID: 235920-2
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	100	U		18	100	20.0000	ug/L	147690		04/29/05 1649	mjk
	Toluene	980			3.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	trans-1,3-Dichloropropene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,1,2-Trichloroethane	20	U		4.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Tetrachloroethene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,3-Dichloropropane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	2-Hexanone	100	U		20	100	20.0000	ug/L	147690		04/29/05 1649	mjk
	Dibromochloromethane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2-Dibromoethane (EDB)	20	U		6.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Chlorobenzene	20	U		3.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,1,1,2-Tetrachloroethane	20	U		6.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Ethylbenzene	170			4.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	m&p-Xylenes	540			7.2	40	20.0000	ug/L	147690		04/29/05 1649	mjk
	o-Xylene	220			3.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Styrene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Bromoform	20	U		6.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Isopropylbenzene	20	U		4.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Bromobenzene	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,1,2,2-Tetrachloroethane	20	U		6.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2,3-Trichloropropane	20	U		7.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	n-Propylbenzene	21			3.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	2-Chlorotoluene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,3,5-Trimethylbenzene	46			3.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	4-Chlorotoluene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	tert-Butylbenzene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2,4-Trimethylbenzene	130			5.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	sec-Butylbenzene	20	U		3.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,3-Dichlorobenzene	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	p-Isopropyltoluene	20	U		5.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-3A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041002
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:45
Sample Matrix.....: Water

Laboratory Sample ID: 235920-2
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	30			5.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	n-Butylbenzene	20	U		7.0	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2-Dichlorobenzene	63			5.8	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2-Dibromo-3-chloropropane	20	U		8.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2,4-Trichlorobenzene	20	U		7.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Hexachlorobutadiene	20	U		7.2	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Naphthalene	38		J	7.4	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	1,2,3-Trichlorobenzene	20	U		8.6	20	20.0000	ug/L	147690		04/29/05 1649	mjk
	Xylenes (total)	770			11	40	20.0000	ug/L	147690		04/29/05 1649	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-3B

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041003
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:10
Sample Matrix.....: Water

Laboratory Sample ID: 235920-3
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	20	U		2.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Chloromethane	20	U		4.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Vinyl chloride	120		*	3.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Bromomethane	20	U		12	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Chloroethane	19000		*J	64	200	200.000	ug/L	147690	D1	04/29/05 1803	mjk
	Trichlorofluoromethane	20	U		2.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,1-Dichloroethene	20	U		5.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Carbon disulfide	100	U	*	3.0	100	20.0000	ug/L	147690		04/29/05 1738	mjk
	Acetone	100	U		28	100	20.0000	ug/L	147690		04/29/05 1738	mjk
	Methylene chloride	20	U		4.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	trans-1,2-Dichloroethene	20	U	*	5.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Methyl-tert-butyl-ether (MTBE)	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,1-Dichloroethane	160			3.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	2,2-Dichloropropane	20	U		3.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	cis-1,2-Dichloroethene	48			4.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	2-Butanone (MEK)	100	U		20	100	20.0000	ug/L	147690		04/29/05 1738	mjk
	Bromochloromethane	20	U		5.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Chloroform	20	U		2.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,1,1-Trichloroethane	20	U		3.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,1-Dichloropropene	20	U		7.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Carbon tetrachloride	20	U		6.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Benzene	160			4.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2-Dichloroethane	20	U		5.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Trichloroethene	20	U		2.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2-Dichloropropane	20	U		3.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Dibromomethane	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Bromodichloromethane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	cis-1,3-Dichloropropene	20	U		3.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk

* In Description = Dry Wgt.

aW
5-16-05

C-3B

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041003
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:10
Sample Matrix.....: Water

Laboratory Sample ID: 235920-3
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	100	U		18	100	20.0000	ug/L	147690		04/29/05 1738	mjk
	Toluene	730			3.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	trans-1,3-Dichloropropene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,1,2-Trichloroethane	20	U		4.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Tetrachloroethene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,3-Dichloropropane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	2-Hexanone	100	U		20	100	20.0000	ug/L	147690		04/29/05 1738	mjk
	Dibromochloromethane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2-Dibromoethane (EDB)	20	U		6.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Chlorobenzene	20	U		3.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,1,1,2-Tetrachloroethane	20	U		6.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Ethylbenzene	150			4.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	m&p-Xylenes	520			7.2	40	20.0000	ug/L	147690		04/29/05 1738	mjk
	o-Xylene	220			3.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Styrene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Bromoform	20	U		6.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Isopropylbenzene	15	J		4.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Bromobenzene	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,1,2,2-Tetrachloroethane	20	U		6.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2,3-Trichloropropane	20	U		7.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	n-Propylbenzene	25			3.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	2-Chlorotoluene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,3,5-Trimethylbenzene	56			3.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	4-Chlorotoluene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	tert-Butylbenzene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2,4-Trimethylbenzene	180			5.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	sec-Butylbenzene	20	U		3.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,3-Dichlorobenzene	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	p-Isopropyltoluene	20	U		5.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk

* In Description = Dry Wgt.

aW
5-16-05

C-3B

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235920

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041003
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:10
Sample Matrix.....: Water

Laboratory Sample ID: 235920-3
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	38			5.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	n-Butylbenzene	20	U		7.0	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2-Dichlorobenzene	74			5.8	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2-Dibromo-3-chloropropane	20	U		8.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2,4-Trichlorobenzene	20	U		7.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Hexachlorobutadiene	20	U		7.2	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Naphthalene	60		J	7.4	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	1,2,3-Trichlorobenzene	20	U		8.6	20	20.0000	ug/L	147690		04/29/05 1738	mjk
	Xylenes (total)	740			11	40	20.0000	ug/L	147690		04/29/05 1738	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-3C

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SNAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041004
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235857-2
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Vinyl chloride	25			0.16	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Chloroethane	250			1.6	5.0	5.00000	ug/L	147139	D1	04/25/05 2136	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,1-Dichloroethene	5.3			0.25	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Methylene chloride	1.6		U	0.24	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,1-Dichloroethane	33			0.15	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	cis-1,2-Dichloroethene	40			0.20	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Benzene	4.0			0.23	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn

* In Description = Dry Wgt.

aw 5-12-05

C-3C

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041004
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235857-2
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Toluene	7.1			0.18	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Ethylbenzene	1.1			0.21	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	m&p-Xylenes	2.9			0.36	2.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	o-Xylene	1.7			0.19	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2,4-Trimethylbenzene	0.88	J		0.26	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn

* In Description = Dry Wgt.

ajw
5-12-05

C-3C

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041004
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235857-2
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	0.91	J	B	0.25	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2-Dichlorobenzene	1.9			0.29	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147139		04/25/05 2114	jdn
	Xylenes (total)	4.8			0.54	2.0	1.00000	ug/L	147139		04/25/05 2114	jdn

* In Description = Dry Wgt.

aW
5-12-05

FD of C-3C

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041005
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235857-3
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Vinyl chloride	23			0.16	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Chloroethane	210			1.6	5.0	5.00000	ug/L	147234	D1	04/26/05 1852	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,1-Dichloroethene	5.1			0.25	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,1-Dichloroethane	31			0.15	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	cis-1,2-Dichloroethene	39			0.20	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Benzene	4.0			0.23	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Trichloroethene	0.55	J		0.13	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk

* In Description = Dry Wgt.

aZW
5-12-05

FD of C-3C

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041005
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235857-3
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Toluene	6.9			0.18	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Ethylbenzene	1.0	J		0.21	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	m&p-Xylenes	2.9			0.36	2.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	o-Xylene	1.6			0.19	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2,4-Trimethylbenzene	0.95	J		0.26	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk

* In Description = Dry Wgt.

aro
5-12-05

FD of C-3C

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041005
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 235857-3
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	0.92	J		0.25	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2-Dichlorobenzene	2.0			0.29	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Naphthalene	1.2			0.37	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 1830	mjk
	Xylenes (total)	4.6			0.54	2.0	1.00000	ug/L	147234		04/26/05 1830	mjk

* In Description = Dry Wgt.

aw 5-12-05

C-4A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041006
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:10
Sample Matrix.....: Water

Laboratory Sample ID: 235857-4
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	20	U		2.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Chloromethane	20	U		4.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Vinyl chloride	52			3.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Bromomethane	20	U	✓	12	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Chloroethane	480			6.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Trichlorofluoromethane	20	U		2.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,1-Dichloroethene	860			5.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Carbon disulfide	100	U		3.0	100	20.0000	ug/L	147234		04/27/05 0313	mjk
	Acetone	100	U		28	100	20.0000	ug/L	147234		04/27/05 0313	mjk
	Methylene chloride	20	U		4.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	trans-1,2-Dichloroethene	20	U		5.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Methyl-tert-butyl-ether (MTBE)	20	U		4.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,1-Dichloroethane	7000			15	100	100.000	ug/L	147234	D1	04/26/05 1914	mjk
	2,2-Dichloropropane	20	U		3.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	cis-1,2-Dichloroethene	3100			20	100	100.000	ug/L	147234	D1	04/26/05 1914	mjk
	2-Butanone (MEK)	100	U		20	100	20.0000	ug/L	147234		04/27/05 0313	mjk
	Bromochloromethane	20	U		5.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Chloroform	20	U		2.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,1,1-Trichloroethane	2700			17	100	100.000	ug/L	147234	D1	04/26/05 1914	mjk
	1,1-Dichloropropene	20	U		7.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Carbon tetrachloride	20	U		6.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Benzene	44			4.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2-Dichloroethane	20	U		5.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Trichloroethene	20	U		2.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2-Dichloropropane	20	U		3.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Dibromomethane	20	U		4.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Bromodichloromethane	20	U		4.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	cis-1,3-Dichloropropene	20	U		3.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk

* In Description = Dry Wgt.

QW 5-12-05

C-4A

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041006
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:10
Sample Matrix.....: Water

Laboratory Sample ID: 235857-4
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	100	U		18	100	20.0000	ug/L	147234		04/27/05 0313	mjk
	Toluene	1400			3.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	trans-1,3-Dichloropropene	20	U		3.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,1,2-Trichloroethane	20	U		4.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Tetrachloroethene	20	U		3.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,3-Dichloropropane	20	U		4.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	2-Hexanone	100	U		20	100	20.0000	ug/L	147234		04/27/05 0313	mjk
	Dibromochloromethane	20	U		4.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2-Dibromoethane (EDB)	20	U		6.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Chlorobenzene	20	U		3.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,1,1,2-Tetrachloroethane	20	U		6.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Ethylbenzene	260			4.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	m&p-Xylenes	960			7.2	40	20.0000	ug/L	147234		04/27/05 0313	mjk
	o-Xylene	420			3.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Styrene	20	U		3.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Bromoform	20	U		6.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Isopropylbenzene	24			4.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Bromobenzene	20	U		4.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,1,2,2-Tetrachloroethane	20	U		6.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2,3-Trichloropropane	20	U		7.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	n-Propylbenzene	39			3.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	2-Chlorotoluene	20	U		3.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,3,5-Trimethylbenzene	110			3.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	4-Chlorotoluene	20	U		3.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	tert-Butylbenzene	20	U		3.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2,4-Trimethylbenzene	330			5.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	sec-Butylbenzene	20	U		3.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,3-Dichlorobenzene	20	U		4.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	p-Isopropyltoluene	20	U		5.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk

* In Description = Dry Wgt.

aZW 5-12-05

C-4A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041006
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:10
Sample Matrix.....: Water

Laboratory Sample ID: 235857-4
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	69			5.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	n-Butylbenzene	20	U		7.0	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2-Dichlorobenzene	120			5.8	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2-Dibromo-3-chloropropane	20	U		8.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2,4-Trichlorobenzene	20	U		7.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Hexachlorobutadiene	20	U		7.2	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Naphthalene	190			7.4	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	1,2,3-Trichlorobenzene	20	U		8.6	20	20.0000	ug/L	147234		04/27/05 0313	mjk
	Xylenes (total)	1400			11	40	20.0000	ug/L	147234		04/27/05 0313	mjk

* In Description = Dry Wgt.

QC
5-12-05

C-5A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920 .

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041007
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:20
Sample Matrix.....: Water

Laboratory Sample ID: 235920-4
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	20	U		2.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Chloromethane	20	U		4.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Vinyl chloride	79			3.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Bromomethane	20	U		12	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Chloroethane	13000		J	64	200	200.000	ug/L	147690	D1	04/29/05 1852	mjk
	Trichlorofluoromethane	20	U		2.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,1-Dichloroethene	20	U		5.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Carbon disulfide	100	U		3.0	100	20.0000	ug/L	147690		04/29/05 1827	mjk
	Acetone	100	U		28	100	20.0000	ug/L	147690		04/29/05 1827	mjk
	Methylene chloride	20	U		4.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	trans-1,2-Dichloroethene	20	U		5.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Methyl-tert-butyl-ether (MTBE)	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,1-Dichloroethane	41			3.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	2,2-Dichloropropane	20	U		3.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	cis-1,2-Dichloroethene	65			4.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	2-Butanone (MEK)	100	U		20	100	20.0000	ug/L	147690		04/29/05 1827	mjk
	Bromochloromethane	20	U		5.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Chloroform	20	U		2.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,1,1-Trichloroethane	20	U		3.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,1-Dichloropropene	20	U		7.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Carbon tetrachloride	20	U		6.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Benzene	46			4.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2-Dichloroethane	20	U		5.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Trichloroethene	20	U		2.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2-Dichloropropane	20	U		3.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Dibromomethane	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Bromodichloromethane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	cis-1,3-Dichloropropene	20	U		3.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk

* In Description = Dry Wgt.

aw 5-16-05

C-5A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-D4 ATTN: Keely Meadows

Customer Sample ID: OU041007
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:20
Sample Matrix.....: Water

Laboratory Sample ID: 235920-4
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	100	U		18	100	20.0000	ug/L	147690		04/29/05 1827	mjk
	Toluene	250			3.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	trans-1,3-Dichloropropene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,1,2-Trichloroethane	20	U		4.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Tetrachloroethene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,3-Dichloropropane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	2-Hexanone	100	U		20	100	20.0000	ug/L	147690		04/29/05 1827	mjk
	Dibromochloromethane	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2-Dibromoethane (EDB)	20	U		6.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Chlorobenzene	20	U		3.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,1,1,2-Tetrachloroethane	20	U		6.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Ethylbenzene	210			4.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	m&p-Xylenes	700			7.2	40	20.0000	ug/L	147690		04/29/05 1827	mjk
	o-Xylene	150			3.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Styrene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Bromoform	20	U		6.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Isopropylbenzene	19	J		4.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Bromobenzene	20	U		4.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,1,2,2-Tetrachloroethane	20	U		6.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2,3-Trichloropropane	20	U		7.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	n-Propylbenzene	23			3.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	2-Chlorotoluene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,3,5-Trimethylbenzene	55			3.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	4-Chlorotoluene	20	U		3.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	tert-Butylbenzene	20	U		3.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2,4-Trimethylbenzene	140			5.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	sec-Butylbenzene	20	U		3.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,3-Dichlorobenzene	20	U		4.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	p-Isopropyltoluene	20	U		5.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-5A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041007
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:20
Sample Matrix.....: Water

Laboratory Sample ID: 235920-4
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	33			5.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	n-Butylbenzene	20	U		7.0	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2-Dichlorobenzene	20	U		5.8	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2-Dibromo-3-chloropropane	20	U		8.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2,4-Trichlorobenzene	20	U		7.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Hexachlorobutadiene	20	U		7.2	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Naphthalene	38		J	7.4	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	1,2,3-Trichlorobenzene	20	U		8.6	20	20.0000	ug/L	147690		04/29/05 1827	mjk
	Xylenes (total)	850			11	40	20.0000	ug/L	147690		04/29/05 1827	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-5B

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041008
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:53
Sample Matrix.....: Water

Laboratory Sample ID: 235857-5
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	10	U		1.2	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Chloromethane	10	U		2.0	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Vinyl chloride	140			1.6	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Bromomethane	10	U	✗	5.9	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Chloroethane	2300			32	100	100.000	ug/L	147234	D1	04/26/05 2019	mjk
	Trichlorofluoromethane	10	U		1.4	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,1-Dichloroethene	5.1	J		2.5	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Carbon disulfide	50	U		1.5	50	10.0000	ug/L	147234		04/26/05 1957	mjk
	Acetone	50	U		14	50	10.0000	ug/L	147234		04/26/05 1957	mjk
	Methylene chloride	10	U		2.4	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	trans-1,2-Dichloroethene	10	U		2.9	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Methyl-tert-butyl-ether (MTBE)	10	U		2.1	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,1-Dichloroethane	130			1.5	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	2,2-Dichloropropane	10	U		1.7	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	cis-1,2-Dichloroethene	110			2.0	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	2-Butanone (MEK)	50	U		10	50	10.0000	ug/L	147234		04/26/05 1957	mjk
	Bromochloromethane	10	U		2.7	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Chloroform	10	U		1.4	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,1,1-Trichloroethane	10	U		1.7	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,1-Dichloropropene	10	U		3.8	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Carbon tetrachloride	10	U		3.4	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Benzene	22			2.3	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2-Dichloroethane	10	U		2.5	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Trichloroethene	10	U		1.3	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2-Dichloropropane	10	U		1.9	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Dibromomethane	10	U		2.1	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Bromodichloromethane	10	U		2.2	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	cis-1,3-Dichloropropene	10	U		1.5	10	10.0000	ug/L	147234		04/26/05 1957	mjk

* In Description = Dry Wgt.

aw 5-12-05

C-5B

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041008
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:53
Sample Matrix.....: Water

Laboratory Sample ID: 235857-5
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	50	U		9.2	50	10.0000	ug/L	147234		04/26/05 1957	mjk
	Toluene	260			1.8	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	trans-1,3-Dichloropropene	10	U		1.6	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,1,2-Trichloroethane	10	U		2.4	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Tetrachloroethene	10	U		1.8	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,3-Dichloropropane	10	U		2.2	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	2-Hexanone	50	U		9.9	50	10.0000	ug/L	147234		04/26/05 1957	mjk
	Dibromochloromethane	10	U		2.2	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2-Dibromoethane (EDB)	10	U		3.3	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Chlorobenzene	10	U		1.5	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,1,1,2-Tetrachloroethane	10	U		3.3	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Ethylbenzene	96			2.1	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	m&p-Xylenes	290			3.6	20	10.0000	ug/L	147234		04/26/05 1957	mjk
	o-Xylene	110			1.9	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Styrene	10	U		1.8	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Bromoform	10	U		3.2	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Isopropylbenzene	9.2	J		2.0	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Bromobenzene	10	U		2.2	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,1,2,2-Tetrachloroethane	10	U		3.4	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2,3-Trichloropropane	10	U		3.5	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	n-Propylbenzene	14			1.6	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	2-Chlorotoluene	10	U		1.6	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,3,5-Trimethylbenzene	32			1.8	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	4-Chlorotoluene	10	U		1.8	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	tert-Butylbenzene	10	U		1.6	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2,4-Trimethylbenzene	100			2.6	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	sec-Butylbenzene	10	U		1.9	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,3-Dichlorobenzene	10	U		2.1	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	p-Isopropyltoluene	10	U		2.9	10	10.0000	ug/L	147234		04/26/05 1957	mjk

* In Description = Dry Wgt.

aw
5-12-05

C-5B

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keety Meadows

Customer Sample ID: OU041008
Date Sampled.....: 04/15/2005
Time Sampled.....: 13:53
Sample Matrix.....: Water

Laboratory Sample ID: 235857-5
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	20			2.5	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	n-Butylbenzene	10	U		3.5	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2-Dichlorobenzene	39			2.9	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2-Dibromo-3-chloropropane	10	U		4.1	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2,4-Trichlorobenzene	10	U		3.6	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Hexachlorobutadiene	10	U		3.6	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Naphthalene	51			3.7	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	1,2,3-Trichlorobenzene	10	U		4.3	10	10.0000	ug/L	147234		04/26/05 1957	mjk
	Xylenes (total)	420			5.4	20	10.0000	ug/L	147234		04/26/05 1957	mjk

* In Description = Dry Wgt.

aw 5-12-05

C-5C

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041009
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:27
Sample Matrix.....: Water

Laboratory Sample ID: 235828-1
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Chloroethane	8.7			0.32	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,1-Dichloroethane	2.8			0.15	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	cis-1,2-Dichloroethene	0.67	J		0.20	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn

* In Description = Dry Wgt.

ATW 5-11-05

C-5C

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041009
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:27
Sample Matrix.....: Water

Laboratory Sample ID: 235828-1
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn

* In Description = Dry Wgt.

aw
5-11-05

C-5C

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041009
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:27
Sample Matrix.....: Water

Laboratory Sample ID: 235828-1
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1037	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1037	jdn

* In Description = Dry Wgt.

aro
5-11-05

C-7A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041010
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-5
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Chloroethane	930		*J	3.2	10	10.0000	ug/L	147690	D1	04/29/05 1941	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Carbon disulfide	5.0	U	*	0.15	5.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	trans-1,2-Dichloroethene	1.0	U	*	0.29	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,1-Dichloroethane	8.3			0.15	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Benzene	10			0.23	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Dibrommethane	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk

* In Description = Dry Wgt.

aw
5-16-05

C-7A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041010
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-5
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Toluene	4.6			0.18	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Ethylbenzene	46			0.21	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	m&p-Xylenes	92			0.36	2.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	o-Xylene	29			0.19	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Isopropylbenzene	5.7			0.20	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	n-Propylbenzene	8.0			0.16	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,3,5-Trimethylbenzene	10			0.18	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	tert-Butylbenzene	0.41	J	~~B~~	0.16	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2,4-Trimethylbenzene	47			0.26	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	sec-Butylbenzene	1.5			0.19	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,3-Dichlorobenzene	1.3		~~H~~	0.21	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk

* In Description = Dry Wgt.

azw 5-16-05

C-7A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041010
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-5
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	6.0			0.25	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2-Dichlorobenzene	11			0.29	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Naphthalene	18		J	0.37	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147690		04/29/05 1916	mjk
	Xylenes (total)	120			0.54	2.0	1.00000	ug/L	147690		04/29/05 1916	mjk

* In Description = Dry Wgt.

aw 5-16-05

C-8A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041011
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:45
Sample Matrix.....: Water

Laboratory Sample ID: 235828-2
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	10	U		1.2	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Chloromethane	10	U		2.0	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Vinyl chloride	16			1.6	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Bromomethane	10	U		5.9	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Chloroethane	160			3.2	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Trichlorofluoromethane	10	U		1.4	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,1-Dichloroethene	63			2.5	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Carbon disulfide	50	U		1.5	50	10.0000	ug/L	147485		04/28/05 1059	jdn
	Acetone	50	U	J	14	50	10.0000	ug/L	147485		04/28/05 1059	jdn
	Methylene chloride	10	U		2.4	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	trans-1,2-Dichloroethene	10	U		2.9	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Methyl-tert-butyl-ether (MTBE)	10	U		2.1	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,1-Dichloroethane	3600			15	100	100.000	ug/L	147485	D1	04/28/05 1121	jdn
	2,2-Dichloropropane	10	U		1.7	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	cis-1,2-Dichloroethene	270			2.0	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	2-Butanone (MEK)	50	U		10	50	10.0000	ug/L	147485		04/28/05 1059	jdn
	Bromochloromethane	10	U		2.7	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Chloroform	10	U		1.4	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,1,1-Trichloroethane	150			1.7	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,1-Dichloropropene	10	U		3.8	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Carbon tetrachloride	10	U		3.4	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Benzene	17			2.3	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2-Dichloroethane	10	U		2.5	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Trichloroethene	10	U		1.3	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2-Dichloropropane	10	U		1.9	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Dibromomethane	10	U		2.1	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Bromodichloromethane	10	U		2.2	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	cis-1,3-Dichloropropene	10	U		1.5	10	10.0000	ug/L	147485		04/28/05 1059	jdn

* In Description = Dry Wgt.

aw 5-11-05

C-8A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041011
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:45
Sample Matrix.....: Water

Laboratory Sample ID: 235828-2
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	50	U		9.2	50	10.0000	ug/L	147485		04/28/05 1059	jdn
	Toluene	450			1.8	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	trans-1,3-Dichloropropene	10	U		1.6	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,1,2-Trichloroethane	10	U		2.4	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Tetrachloroethene	10	U		1.8	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,3-Dichloropropane	10	U		2.2	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	2-Hexanone	50	U		9.9	50	10.0000	ug/L	147485		04/28/05 1059	jdn
	Dibromochloromethane	10	U		2.2	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2-Dibromoethane (EDB)	10	U		3.3	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Chlorobenzene	10	U		1.5	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,1,1,2-Tetrachloroethane	10	U		3.3	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Ethylbenzene	220			2.1	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	m&p-Xylenes	830			3.6	20	10.0000	ug/L	147485		04/28/05 1059	jdn
	o-Xylene	360			1.9	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Styrene	13			1.8	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Bromoform	10	U		3.2	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Isopropylbenzene	25			2.0	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Bromobenzene	10	U		2.2	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,1,2,2-Tetrachloroethane	10	U		3.4	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2,3-Trichloropropane	10	U		3.5	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	n-Propylbenzene	45			1.6	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	2-Chlorotoluene	46			1.6	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,3,5-Trimethylbenzene	160			1.8	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	4-Chlorotoluene	10	U		1.8	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	tert-Butylbenzene	10	U		1.6	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2,4-Trimethylbenzene	410			2.6	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	sec-Butylbenzene	9.6	J		1.9	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,3-Dichlorobenzene	18			2.1	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	p-Isopropyltoluene	12			2.9	10	10.0000	ug/L	147485		04/28/05 1059	jdn

* In Description = Dry Wgt.

aw
5-11-05

C-8A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041011
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:45
Sample Matrix.....: Water

Laboratory Sample ID: 235828-2
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	76			2.5	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	n-Butylbenzene	26			3.5	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2-Dichlorobenzene	130			2.9	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2-Dibromo-3-chloropropane	10	U		4.1	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2,4-Trichlorobenzene	10	U		3.6	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Hexachlorobutadiene	10	U		3.6	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Naphthalene	240			3.7	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	1,2,3-Trichlorobenzene	10	U		4.3	10	10.0000	ug/L	147485		04/28/05 1059	jdn
	Xylenes (total)	1200			5.4	20	10.0000	ug/L	147485		04/28/05 1059	jdn

* In Description = Dry Wgt.

aw
5-11-05

C-9A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041012
Date Sampled.....: 04/19/2005
Time Sampled.....: 13:45
Sample Matrix.....: Water

Laboratory Sample ID: 235920-6
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Vinyl chloride	3.0		H	0.16	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Chloroethane	68		J	0.32	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,1-Dichloroethane	30			0.15	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Benzene	17			0.23	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk

* In Description = Dry Wgt.

aw 5-16-05

C-9A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041012
Date Sampled.....: 04/19/2005
Time Sampled.....: 13:45
Sample Matrix.....: Water

Laboratory Sample ID: 235920-6
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Toluene	22			0.18	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Ethylbenzene	87			0.21	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	m&p-Xylenes	180			0.36	2.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	o-Xylene	34			0.19	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Isopropylbenzene	13			0.20	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	n-Propylbenzene	14			0.16	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,3,5-Trimethylbenzene	29			0.18	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2,4-Trimethylbenzene	83			0.26	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	sec-Butylbenzene	2.6			0.19	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk

* In Description = Dry Wgt.

AW
5-16-05

C-9A

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041012
Date Sampled.....: 04/19/2005
Time Sampled.....: 13:45
Sample Matrix.....: Water

Laboratory Sample ID: 235920-6
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	2.8			0.25	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Naphthalene	23		HJ	0.37	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147690		04/29/05 2005	mjk
	Xylenes (total)	220			0.54	2.0	1.00000	ug/L	147690		04/29/05 2005	mjk

* In Description = Dry Wgt.

azw 5-16-05

C-9B

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041013
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-6
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Chloroethane	340			3.2	10	10.0000	ug/L	147234	D1	04/26/05 2103	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,1-Dichloroethane	29			0.15	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Benzene	12			0.23	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk

* In Description = Dry Wgt.

aw
5-12-05

C-9B

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041013
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-6
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Toluene	48			0.18	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Ethylbenzene	65			0.21	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	m&p-Xylenes	140			0.36	2.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	o-Xylene	43			0.19	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Isopropylbenzene	7.3			0.20	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	n-Propylbenzene	10			0.16	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,3,5-Trimethylbenzene	18			0.18	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2,4-Trimethylbenzene	68			0.26	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	sec-Butylbenzene	2.0			0.19	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,3-Dichlorobenzene	1.6			0.21	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	p-Isopropyltoluene	2.0			0.29	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk

* In Description = Dry Wgt.

aw 5-12-05

C-9B

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041013
Date Sampled.....: 04/15/2005
Time Sampled.....: 15:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-6
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	7.4			0.25	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	n-Butylbenzene	2.8			0.35	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2-Dichlorobenzene	13			0.29	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Naphthalene	38			0.37	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 2041	mjk
	Xylenes (total)	190			0.54	2.0	1.00000	ug/L	147234		04/26/05 2041	mjk

* In Description = Dry Wgt.

QZD
5-12-05

C-9C

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041014
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-3
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Chloroethane	2.9			0.32	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Benzene	0.51	J		0.23	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn

* In Description = Dry Wgt.

aw
5-11-05

C-9C

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041014
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-3
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Toluene	~~0.79~~	~~J~~	~~x~~ 1 U	0.18	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Ethylbenzene	0.93	J		0.21	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	m&p-Xylenes	1.7	J		0.36	2.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	o-Xylene	0.72	J		0.19	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2,4-Trimethylbenzene	0.73	J		0.26	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn

* In Description = Dry Wgt.

aw 5-11-05

C-9C

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041014
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-3
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1143	jdn
	Xylenes (total)	2.5			0.54	2.0	1.00000	ug/L	147485		04/28/05 1143	jdn

* In Description = Dry Wgt.

aW 5-11-05

C-10

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041015
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-7
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Chloroethane	1.1		*J	0.32	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Carbon disulfide	5.0	U	*	0.15	5.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	trans-1,2-Dichloroethene	1.0	U	*	0.29	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Benzene	21			0.23	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk

* In Description = Dry Wgt.

aW 5-16-05

C-10

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB DU-04 ATTN: Keely Meadows

Customer Sample ID: OU041015
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-7
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Toluene	3.0			0.18	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Ethylbenzene	62			0.21	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	m&p-Xylenes	110			0.36	2.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	o-Xylene	6.5			0.19	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Isopropylbenzene	11			0.20	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	n-Propylbenzene	13			0.16	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,3,5-Trimethylbenzene	19			0.18	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2,4-Trimethylbenzene	65			0.26	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	sec-Butylbenzene	2.9			0.19	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk

* In Description = Dry Wgt.

aro
5-16-05

C-10

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041015
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235920-7
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Naphthalene	31		J	0.37	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147690		04/29/05 2054	mjk
	Xylenes (total)	120			0.54	2.0	1.00000	ug/L	147690		04/29/05 2054	mjk

* In Description = Dry Wgt.

ajo 5-16-05

C-11

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041016
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-7
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Vinyl chloride	2.8			0.16	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Bromomethane	1.0	U	*	0.59	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Chloroethane	31			0.32	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,1-Dichloroethene	8.0			0.25	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,1-Dichloroethane	5.7			0.15	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	cis-1,2-Dichloroethene	44			0.20	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Benzene	13			0.23	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk

* In Description = Dry Wgt.

aw
5-12-05

C-11

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041016
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-7
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Toluene	5.9			0.18	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Chlorobenzene	0.76	J		0.15	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Ethylbenzene	33			0.21	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	m&p-Xylenes	78			0.36	2.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	o-Xylene	43			0.19	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Isopropylbenzene	3.3			0.20	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	n-Propylbenzene	3.6			0.16	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,3,5-Trimethylbenzene	7.0			0.18	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2,4-Trimethylbenzene	36			0.26	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,3-Dichlorobenzene	0.95	J		0.21	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	p-Isopropyltoluene	0.76	J		0.29	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk

* In Description = Dry Wgt.

aw
5-12-05

C-11

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041016
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-7
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	4.5			0.25	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2-Dichlorobenzene	8.7			0.29	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Naphthalene	17			0.37	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 2125	mjk
	Xylenes (total)	120			0.54	2.0	1.00000	ug/L	147234		04/26/05 2125	mjk

* In Description = Dry Wgt.

aro
5-12-05

FD of C-11

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041017
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-8
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Vinyl chloride	2.8			0.16	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Bromomethane	1.0	U	✗	0.59	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Chloroethane	30			0.32	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,1-Dichloroethene	7.4			0.25	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Acetone	34			1.4	5.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	trans-1,2-Dichloroethene	1.1			0.29	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,1-Dichloroethane	5.3			0.15	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	cis-1,2-Dichloroethene	40			0.20	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Benzene	12			0.23	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041017
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-8
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Toluene	6.1			0.18	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Chlorobenzene	0.66	J		0.15	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Ethylbenzene	34			0.21	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	m&p-Xylenes	80			0.36	2.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	o-Xylene	42			0.19	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Isopropylbenzene	3.7			0.20	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	n-Propylbenzene	3.8			0.16	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,3,5-Trimethylbenzene	6.8			0.18	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2,4-Trimethylbenzene	36			0.26	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,3-Dichlorobenzene	0.90	J	✗	0.21	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-D4 ATTN: Keely Meadows

Customer Sample ID: OU041017
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-8
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	4.2			0.25	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2-Dichlorobenzene	8.5			0.29	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Naphthalene	15			0.37	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 2147	mjk
	Xylenes (total)	130			0.54	2.0	1.00000	ug/L	147234		04/26/05 2147	mjk

* In Description = Dry Wgt.

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STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041018
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-4
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Vinyl chloride	1.5			0.16	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Chloroethane	4.3			0.32	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,1-Dichloroethene	2.9			0.25	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	trans-1,2-Dichloroethene	0.94	J		0.29	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,1-Dichloroethane	1.1			0.15	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	2,2-Dichloropropane	1.0	U	✗	0.17	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	cis-1,2-Dichloroethene	27			0.20	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,1-Dichloropropene	1.0	U	✗	0.38	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Benzene	3.0			0.23	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn

* In Description = Dry Wgt.

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5-11-05

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041018
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-4
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Ethylbenzene	0.64	J		0.21	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	m&p-Xylenes	0.95	J		0.36	2.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	o-Xylene	1.1			0.19	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2,4-Trimethylbenzene	1.1			0.26	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn

* In Description = Dry Wgt.

AW 5-11-05

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STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041018
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-4
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1204	jdn
	Xylenes (total)	2.1			0.54	2.0	1.00000	ug/L	147485		04/28/05 1204	jdn

* In Description = Dry Wgt.

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STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-D4 ATTN: Keely Meadows

Customer Sample ID: OU041D19
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:25
Sample Matrix.....: Water

Laboratory Sample ID: 235920-8
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	10	U		1.2	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Chloromethane	10	U		2.0	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Vinyl chloride	10	U		1.6	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Bromomethane	10	U		5.9	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Chloroethane	5700			32	100	100.000	ug/L	147778	D1	05/03/05 1525	jdn
	Trichlorofluoromethane	10	U		1.4	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,1-Dichloroethene	10	U		2.5	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Carbon disulfide	50	U		1.5	50	10.0000	ug/L	147778		05/03/05 1547	jdn
	Acetone	50	U	J	14	50	10.0000	ug/L	147778		05/03/05 1547	jdn
	Methylene chloride	10	U		2.4	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	trans-1,2-Dichloroethene	10	U		2.9	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Methyl-tert-butyl-ether (MTBE)	10	U		2.1	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,1-Dichloroethane	10	U		1.5	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	2,2-Dichloropropane	10	U		1.7	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	cis-1,2-Dichloroethene	10	U		2.0	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	2-Butanone (MEK)	50	U		10	50	10.0000	ug/L	147778		05/03/05 1547	jdn
	Bromochloromethane	10	U		2.7	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Chloroform	10	U		1.4	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,1,1-Trichloroethane	10	U		1.7	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,1-Dichloropropene	10	U		3.8	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Carbon tetrachloride	10	U		3.4	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Benzene	100			2.3	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2-Dichloroethane	10	U		2.5	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Trichloroethene	10	U		1.3	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2-Dichloropropane	10	U		1.9	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Dibromomethane	10	U		2.1	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Bromodichloromethane	10	U		2.2	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	cis-1,3-Dichloropropene	10	U		1.5	10	10.0000	ug/L	147778		05/03/05 1547	jdn

* In Description = Dry Wgt.

aw 5-16-05

C-13

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041019
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:25
Sample Matrix.....: Water

Laboratory Sample ID: 235920-8
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	50	U		9.2	50	10.0000	ug/L	147778		05/03/05 1547	jdn
	Toluene	8.1	J	✗	1.8	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	trans-1,3-Dichloropropene	10	U		1.6	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,1,2-Trichloroethane	10	U		2.4	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Tetrachloroethene	10	U		1.8	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,3-Dichloropropane	10	U		2.2	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	2-Hexanone	50	U		9.9	50	10.0000	ug/L	147778		05/03/05 1547	jdn
	Dibromochloromethane	10	U		2.2	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2-Dibromoethane (EDB)	10	U		3.3	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Chlorobenzene	10	U		1.5	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,1,1,2-Tetrachloroethane	10	U		3.3	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Ethylbenzene	120			2.1	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	m&p-Xylenes	360			3.6	20	10.0000	ug/L	147778		05/03/05 1547	jdn
	o-Xylene	62			1.9	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Styrene	10	U		1.8	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Bromoform	10	U		3.2	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Isopropylbenzene	9.7	J	✗	2.0	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Bromobenzene	10	U		2.2	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,1,2,2-Tetrachloroethane	10	U		3.4	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2,3-Trichloropropane	10	U		3.5	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	n-Propylbenzene	16			1.6	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	2-Chlorotoluene	10	U		1.6	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,3,5-Trimethylbenzene	39			1.8	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	4-Chlorotoluene	10	U		1.8	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	tert-Butylbenzene	10	U		1.6	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2,4-Trimethylbenzene	130			2.6	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	sec-Butylbenzene	10	U		1.9	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,3-Dichlorobenzene	10	U		2.1	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	p-Isopropyltoluene	10	U		2.9	10	10.0000	ug/L	147778		05/03/05 1547	jdn

* In Description = Dry Wgt.

aw 5-16-05

C-13

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041019
Date Sampled.....: 04/19/2005
Time Sampled.....: 14:25
Sample Matrix.....: Water

Laboratory Sample ID: 235920-8
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	31			2.5	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	n-Butylbenzene	10	U		3.5	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2-Dichlorobenzene	59			2.9	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2-Dibromo-3-chloropropane	10	U		4.1	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2,4-Trichlorobenzene	10	U		3.6	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Hexachlorobutadiene	10	U		3.6	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Naphthalene	68			3.7	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	1,2,3-Trichlorobenzene	10	U		4.3	10	10.0000	ug/L	147778		05/03/05 1547	jdn
	Xylenes (total)	440			5.4	20	10.0000	ug/L	147778		05/03/05 1547	jdn

* In Description = Dry Wgt.

aw
5-16-05

C-14

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041020
Date Sampled.....: 04/19/2005
Time Sampled.....: 15:25
Sample Matrix.....: Water

Laboratory Sample ID: 235920-9
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	2.0	U		0.24	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Chloromethane	2.0	U		0.40	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Vinyl chloride	2.3		X	0.32	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Bromomethane	2.0	U		1.2	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Chloroethane	1800		XJ	6.4	20	20.0000	ug/L	147690	D1	04/29/05 2232	mjk
	Trichlorofluoromethane	2.0	U		0.28	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,1-Dichloroethene	5.6			0.50	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Carbon disulfide	10	U	X	0.30	10	2.00000	ug/L	147690		04/29/05 2208	mjk
	Acetone	10	U		2.8	10	2.00000	ug/L	147690		04/29/05 2208	mjk
	Methylene chloride	2.0	U		0.48	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	trans-1,2-Dichloroethene	2.0	U	X	0.58	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Methyl-tert-butyl-ether (MTBE)	2.0	U		0.42	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,1-Dichloroethane	1.2	J		0.30	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	2,2-Dichloropropane	2.0	U		0.34	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	cis-1,2-Dichloroethene	26			0.40	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	2-Butanone (MEK)	10	U		2.0	10	2.00000	ug/L	147690		04/29/05 2208	mjk
	Bromochloromethane	2.0	U		0.54	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Chloroform	2.0	U		0.28	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,1,1-Trichloroethane	2.0	U		0.34	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,1-Dichloropropene	2.0	U		0.76	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Carbon tetrachloride	2.0	U		0.68	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Benzene	8.0			0.46	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2-Dichloroethane	2.0	U		0.50	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Trichloroethene	2.0	U		0.26	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2-Dichloropropane	2.0	U		0.38	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Dibromomethane	2.0	U		0.42	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Bromodichloromethane	2.0	U		0.44	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	cis-1,3-Dichloropropene	2.0	U		0.30	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk

* In Description = Dry Wgt.

aw 5-16-05

C-14

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041020
Date Sampled.....: 04/19/2005
Time Sampled.....: 15:25
Sample Matrix.....: Water

Laboratory Sample ID: 235920-9
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	10	U		1.8	10	2.00000	ug/L	147690		04/29/05 2208	mjk
	Toluene	2.0	U		0.36	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	trans-1,3-Dichloropropene	2.0	U		0.32	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,1,2-Trichloroethane	2.0	U		0.48	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Tetrachloroethene	2.0	U		0.36	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,3-Dichloropropane	2.0	U		0.44	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	2-Hexanone	10	U		2.0	10	2.00000	ug/L	147690		04/29/05 2208	mjk
	Dibromochloromethane	2.0	U		0.44	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2-Dibromoethane (EDB)	2.0	U		0.66	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Chlorobenzene	2.0	U		0.30	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,1,1,2-Tetrachloroethane	2.0	U		0.66	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Ethylbenzene	2.2			0.42	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	m&p-Xylenes	4.7			0.72	4.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	o-Xylene	1.5	J		0.38	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Styrene	2.0	U		0.36	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Bromoform	2.0	U		0.64	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Isopropylbenzene	1.2	J		0.40	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Bromobenzene	2.0	U		0.44	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,1,2,2-Tetrachloroethane	2.0	U		0.68	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2,3-Trichloropropane	2.0	U		0.70	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	n-Propylbenzene	2.0	U		0.32	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	2-Chlorotoluene	2.0	U		0.32	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,3,5-Trimethylbenzene	2.0	U		0.36	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	4-Chlorotoluene	2.0	U		0.36	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	tert-Butylbenzene	2.0	U		0.32	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2,4-Trimethylbenzene	2.0	J		0.52	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	sec-Butylbenzene	2.0	U		0.38	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,3-Dichlorobenzene	2.0	U		0.42	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	p-Isopropyltoluene	2.0	U		0.58	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk

* In Description = Dry Wgt.

aw 5-16-05

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STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041020
Date Sampled.....: 04/19/2005
Time Sampled.....: 15:25
Sample Matrix.....: Water

Laboratory Sample ID: 235920-9
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	2.0	U		0.50	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	n-Butylbenzene	2.0	U		0.70	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2-Dichlorobenzene	2.0	U		0.58	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2-Dibromo-3-chloropropane	2.0	U		0.82	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2,4-Trichlorobenzene	2.0	U		0.72	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Hexachlorobutadiene	2.0	U		0.72	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Naphthalene	2.0	U		0.74	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	1,2,3-Trichlorobenzene	2.0	U		0.86	2.0	2.00000	ug/L	147690		04/29/05 2208	mjk
	Xylenes (total)	6.2			1.1	4.0	2.00000	ug/L	147690		04/29/05 2208	mjk

* In Description = Dry Wgt.

aW 5-16-05

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STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041021
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235920-12
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	2.0	U		0.24	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Chloromethane	2.0	U		0.40	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Vinyl chloride	180			0.32	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Bromomethane	2.0	U		1.2	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Chloroethane	790			3.2	10	10.0000	ug/L	147667	D1	05/03/05 0236	jdn
	Trichlorofluoromethane	2.0	U		0.28	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,1-Dichloroethene	20			0.50	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Carbon disulfide	10	U		0.30	10	2.00000	ug/L	147667		05/03/05 0214	jdn
	Acetone	10	U	J	2.8	10	2.00000	ug/L	147667		05/03/05 0214	jdn
	Methylene chloride	2.0	U		0.48	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	trans-1,2-Dichloroethene	1.5	J		0.58	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Methyl-tert-butyl-ether (MTBE)	2.0	U		0.42	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,1-Dichloroethane	330			1.5	10	10.0000	ug/L	147667	D1	05/03/05 0236	jdn
	2,2-Dichloropropane	2.0	U		0.34	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	cis-1,2-Dichloroethene	250			2.0	10	10.0000	ug/L	147667	D1	05/03/05 0236	jdn
	2-Butanone (MEK)	10	U	J	2.0	10	2.00000	ug/L	147667		05/03/05 0214	jdn
	Bromochloromethane	2.0	U		0.54	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Chloroform	2.0	U		0.28	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,1,1-Trichloroethane	11			0.34	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,1-Dichloropropene	2.0	U		0.76	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Carbon tetrachloride	2.0	U		0.68	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Benzene	10			0.46	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2-Dichloroethane	2.0	U		0.50	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Trichloroethene	2.6			0.26	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2-Dichloropropane	2.0	U		0.38	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Dibromomethane	2.0	U		0.42	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Bromodichloromethane	2.0	U		0.44	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	cis-1,3-Dichloropropene	2.0	U		0.30	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn

* In Description = Dry Wgt.

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C-15

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041021
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235920-12
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	10	U		1.8	10	2.00000	ug/L	147667		05/03/05 0214	jdn
	Toluene	2.0	U		0.36	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	trans-1,3-Dichloropropene	2.0	U		0.32	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,1,2-Trichloroethane	2.0	U		0.48	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Tetrachloroethene	2.0	U		0.36	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,3-Dichloropropane	2.0	U		0.44	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	2-Hexanone	10	U		2.0	10	2.00000	ug/L	147667		05/03/05 0214	jdn
	Dibromochloromethane	2.0	U		0.44	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2-Dibromoethane (EDB)	2.0	U		0.66	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Chlorobenzene	2.0	U		0.30	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,1,1,2-Tetrachloroethane	2.0	U		0.66	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Ethylbenzene	2.0	U		0.42	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	m&p-Xylenes	4.0	U		0.72	4.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	o-Xylene	2.0	U		0.38	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Styrene	2.0	U		0.36	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Bromoform	2.0	U		0.64	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Isopropylbenzene	2.3			0.40	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Bromobenzene	2.0	U		0.44	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,1,2,2-Tetrachloroethane	2.0	U		0.68	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2,3-Trichloropropane	2.0	U		0.70	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	n-Propylbenzene	2.0	U		0.32	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	2-Chlorotoluene	2.0	U		0.32	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,3,5-Trimethylbenzene	2.0	U		0.36	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	4-Chlorotoluene	2.0	U		0.36	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	tert-Butylbenzene	2.0	U		0.32	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2,4-Trimethylbenzene	2.0	U		0.52	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	sec-Butylbenzene	2.0	U		0.38	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,3-Dichlorobenzene	1.7	J		0.42	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	p-Isopropyltoluene	2.0	U		0.58	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn

* In Description = Dry Wgt.

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5-16-05

C-15

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041021
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235920-12
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	8.3			0.50	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	n-Butylbenzene	2.0	U		0.70	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2-Dichlorobenzene	13			0.58	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2-Dibromo-3-chloropropane	2.0	U		0.82	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2,4-Trichlorobenzene	2.0	U		0.72	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Hexachlorobutadiene	2.0	U		0.72	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Naphthalene	2.0	U		0.74	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	1,2,3-Trichlorobenzene	2.0	U		0.86	2.0	2.00000	ug/L	147667		05/03/05 0214	jdn
	Xylenes (total)	4.0	U		1.1	4.0	2.00000	ug/L	147667		05/03/05 0214	jdn

* In Description = Dry Wgt.

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5-16-05

C-16

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041022
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235920-13
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	10	U		1.2	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Chloromethane	10	U		2.0	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Vinyl chloride	9.6	J		1.6	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Bromomethane	10	U	Y	5.9	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Chloroethane	4800			64	200	200.000	ug/L	147667	D1	05/03/05 0320	jdn
	Trichlorofluoromethane	10	U		1.4	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,1-Dichloroethene	10	U		2.5	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Carbon disulfide	50	U		1.5	50	10.0000	ug/L	147667		05/03/05 0258	jdn
	Acetone	50	U	AJ	14	50	10.0000	ug/L	147667		05/03/05 0258	jdn
	Methylene chloride	10	U		2.4	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	trans-1,2-Dichloroethene	10	U		2.9	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Methyl-tert-butyl-ether (MTBE)	10	U		2.1	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,1-Dichloroethane	37			1.5	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	2,2-Dichloropropane	10	U		1.7	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	cis-1,2-Dichloroethene	12			2.0	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	2-Butanone (MEK)	50	U	J	10	50	10.0000	ug/L	147667		05/03/05 0258	jdn
	Bromochloromethane	10	U		2.7	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Chloroform	10	U		1.4	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,1,1-Trichloroethane	10	U		1.7	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,1-Dichloropropene	10	U		3.8	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Carbon tetrachloride	10	U		3.4	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Benzene	140			2.3	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2-Dichloroethane	10	U		2.5	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Trichloroethene	10	U		1.3	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2-Dichloropropane	10	U		1.9	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Dibromomethane	10	U		2.1	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Bromodichloromethane	10	U		2.2	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	cis-1,3-Dichloropropene	10	U		1.5	10	10.0000	ug/L	147667		05/03/05 0258	jdn

* In Description = Dry Wgt.

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5-16-05

C-16

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041022
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235920-13
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	50	U		9.2	50	10.0000	ug/L	147667		05/03/05 0258	jdn
	Toluene	10	U		1.8	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	trans-1,3-Dichloropropene	10	U		1.6	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,1,2-Trichloroethane	10	U		2.4	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Tetrachloroethene	10	U		1.8	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,3-Dichloropropane	10	U		2.2	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	2-Hexanone	50	U		9.9	50	10.0000	ug/L	147667		05/03/05 0258	jdn
	Dibromochloromethane	10	U		2.2	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2-Dibromoethane (EDB)	10	U		3.3	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Chlorobenzene	10	U		1.5	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,1,1,2-Tetrachloroethane	10	U		3.3	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Ethylbenzene	91			2.1	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	m&p-Xylenes	16	J		3.6	20	10.0000	ug/L	147667		05/03/05 0258	jdn
	o-Xylene	8.0	J		1.9	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Styrene	10	U		1.8	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Bromoform	10	U		3.2	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Isopropylbenzene	13			2.0	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Bromobenzene	10	U		2.2	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,1,2,2-Tetrachloroethane	10	U		3.4	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2,3-Trichloropropane	10	U		3.5	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	n-Propylbenzene	16			1.6	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	2-Chlorotoluene	10	U		1.6	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,3,5-Trimethylbenzene	10	U		1.8	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	4-Chlorotoluene	10	U		1.8	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	tert-Butylbenzene	10	U		1.6	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2,4-Trimethylbenzene	8.6	J		2.6	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	sec-Butylbenzene	10	U		1.9	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,3-Dichlorobenzene	10	U		2.1	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	p-Isopropyltoluene	10	U		2.9	10	10.0000	ug/L	147667		05/03/05 0258	jdn

* In Description = Dry Wgt.

aw 5-16-05

C-16

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041022
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235920-13
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	36			2.5	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	n-Butylbenzene	10	U		3.5	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2-Dichlorobenzene	65			2.9	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2-Dibromo-3-chloropropane	10	U		4.1	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2,4-Trichlorobenzene	10	U		3.6	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Hexachlorobutadiene	10	U		3.6	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Naphthalene	10	U		3.7	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	1,2,3-Trichlorobenzene	10	U		4.3	10	10.0000	ug/L	147667		05/03/05 0258	jdn
	Xylenes (total)	24			5.4	20	10.0000	ug/L	147667		05/03/05 0258	jdn

* In Description = Dry Wgt.

aw 5-16-05

C-17

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041023
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-14
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	5.0	U		0.60	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Chloromethane	5.0	U		1.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Vinyl chloride	160			0.80	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Bromomethane	5.0	U	X	3.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Chloroethane	770			16	50	50.0000	ug/L	147667	D1	05/03/05 0403	jdn
	Trichlorofluoromethane	5.0	U		0.70	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,1-Dichloroethene	14			1.2	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Carbon disulfide	25	U		0.75	25	5.00000	ug/L	147667		05/03/05 0341	jdn
	Acetone	25	U	X J	7.0	25	5.00000	ug/L	147667		05/03/05 0341	jdn
	Methylene chloride	5.0	U		1.2	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	trans-1,2-Dichloroethene	5.0	U		1.4	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Methyl-tert-butyl-ether (MTBE)	5.0	U		1.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,1-Dichloroethane	400			7.5	50	50.0000	ug/L	147667	D1	05/03/05 0403	jdn
	2,2-Dichloropropane	5.0	U		0.85	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	cis-1,2-Dichloroethene	190			1.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	2-Butanone (MEK)	25	U	J	5.0	25	5.00000	ug/L	147667		05/03/05 0341	jdn
	Bromochloromethane	5.0	U		1.4	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Chloroform	5.0	U		0.70	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,1,1-Trichloroethane	5.0	U		0.85	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,1-Dichloropropene	5.0	U		1.9	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Carbon tetrachloride	5.0	U		1.7	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Benzene	45			1.2	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2-Dichloroethane	5.0	U		1.2	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Trichloroethene	5.0	U		0.65	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2-Dichloropropane	5.0	U		0.95	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Dibromomethane	5.0	U		1.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Bromodichloromethane	5.0	U		1.1	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	cis-1,3-Dichloropropene	5.0	U		0.75	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn

* In Description = Dry Wgt.

aw 5-16-05

C-17

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041023
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-14
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	25	U		4.6	25	5.00000	ug/L	147667		05/03/05 0341	jdn
	Toluene	5.0	U		0.90	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	trans-1,3-Dichloropropene	5.0	U		0.80	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,1,2-Trichloroethane	5.0	U		1.2	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Tetrachloroethene	5.0	U		0.90	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,3-Dichloropropane	5.0	U		1.1	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	2-Hexanone	25	U		5.0	25	5.00000	ug/L	147667		05/03/05 0341	jdn
	Dibromochloromethane	5.0	U		1.1	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2-Dibromoethane (EDB)	5.0	U		1.6	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Chlorobenzene	5.0	U		0.75	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,1,1,2-Tetrachloroethane	5.0	U		1.6	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Ethylbenzene	5.0	U		1.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	m&p-Xylenes	10	U		1.8	10	5.00000	ug/L	147667		05/03/05 0341	jdn
	o-Xylene	5.0	U		0.95	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Styrene	5.0	U		0.90	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Bromoform	5.0	U		1.6	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Isopropylbenzene	5.6			1.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Bromobenzene	5.0	U		1.1	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,1,2,2-Tetrachloroethane	5.0	U		1.7	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2,3-Trichloropropane	5.0	U		1.8	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	n-Propylbenzene	5.0	U		0.80	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	2-Chlorotoluene	5.0	U		0.80	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,3,5-Trimethylbenzene	5.0	U		0.90	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	4-Chlorotoluene	5.0	U		0.90	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	tert-Butylbenzene	5.0	U		0.80	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2,4-Trimethylbenzene	5.0	U		1.3	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	sec-Butylbenzene	5.0	U		0.95	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,3-Dichlorobenzene	5.0	U		1.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	p-Isopropyltoluene	5.0	U		1.4	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn

* In Description = Dry Wgt.

aw 5-16-05

C-17

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041023
Date Sampled.....: 04/20/2005
Time Sampled.....: 10:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-14
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	14			1.2	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	n-Butylbenzene	5.0	U		1.8	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2-Dichlorobenzene	35			1.4	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2-Dibromo-3-chloropropane	5.0	U		2.0	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2,4-Trichlorobenzene	5.0	U		1.8	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Hexachlorobutadiene	5.0	U		1.8	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Naphthalene	5.0	U		1.8	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	1,2,3-Trichlorobenzene	5.0	U		2.2	5.0	5.00000	ug/L	147667		05/03/05 0341	jdn
	Xylenes (total)	10	U		2.7	10	5.00000	ug/L	147667		05/03/05 0341	jdn

* In Description = Dry Wgt.

aw
5-16-05

C-18

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041024
Date Sampled.....: 04/15/2005
Time Sampled.....: 11:40
Sample Matrix.....: Water

Laboratory Sample ID: 235857-9
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Bromomethane	1.0	U	*	0.59	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk

* In Description = Dry Wgt.

aw
5-12-05

C-18

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041024
Date Sampled.....: 04/15/2005
Time Sampled.....: 11:40
Sample Matrix.....: Water

Laboratory Sample ID: 235857-9
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk

* In Description = Dry Wgt.

QW
5-12-05

C-18

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041024
Date Sampled.....: 04/15/2005
Time Sampled.....: 11:40
Sample Matrix.....: Water

Laboratory Sample ID: 235857-9
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 2208	mjk
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147234		04/26/05 2208	mjk

* In Description = Dry Wgt.

aw
5-12-05

C-19

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041025
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-10
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk

* In Description = Dry Wgt.

aw 5-12-05

C-19

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041025
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-10
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk

* In Description = Dry Wgt.

AW 5-12-05

C-19

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041025
Date Sampled.....: 04/15/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-10
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/26/05 2230	mjk
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147234		04/26/05 2230	mjk

* In Description = Dry Wgt.

azw
5-12-05

C-20

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041026
Date Sampled.....: 04/20/2005
Time Sampled.....: 12:10
Sample Matrix.....: Water

Laboratory Sample ID: 235920-15
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Vinyl chloride	1.6			0.16	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Bromomethane	1.0	U	✓	0.59	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Chloroethane	4.2			0.32	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,1-Dichloroethene	2.4			0.25	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Acetone	5.0	U	J✗	1.4	5.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,1-Dichloroethane	27			0.15	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	cis-1,2-Dichloroethene	4.4			0.20	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	2-Butanone (MEK)	5.0	U	J	1.0	5.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,1,1-Trichloroethane	5.3			0.17	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn

* In Description = Dry Wgt.

aw
5-16-05

C-20

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041026
Date Sampled.....: 04/20/2005
Time Sampled.....: 12:10
Sample Matrix.....: Water

Laboratory Sample ID: 235920-15
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn

* In Description = Dry Wgt.

aw 5-16-05

C-20

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041026
Date Sampled.....: 04/20/2005
Time Sampled.....: 12:10
Sample Matrix.....: Water

Laboratory Sample ID: 235920-15
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147667		05/03/05 0425	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147667		05/03/05 0425	jdn

* In Description = Dry Wgt.

aw 5-16-05

C-21

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041027
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-5
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn

* In Description = Dry Wgt.

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5-11-05

C-21

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041027
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-5
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn

* In Description = Dry Wgt.

aw 5-11-05

C-21

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041027
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-5
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Naphthalene	0.84	J		0.37	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1310	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1310	jdn

* In Description = Dry Wgt.

aw 5-11-05

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STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041028
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-6
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn

* In Description = Dry Wgt.

aw
5-11-05

FD of C-21

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041028
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-6
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DI	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn

* In Description = Dry Wgt.

aw
5-11-05

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041028
Date Sampled.....: 04/14/2005
Time Sampled.....: 13:30
Sample Matrix.....: Water

Laboratory Sample ID: 235828-6
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1332	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1332	jdn

* In Description = Dry Wgt.

aw 5-11-05

SWS-201

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041041
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:35
Sample Matrix.....: Water

Laboratory Sample ID: 235828-12
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Acetone	5.0	U	I	1.4	5.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn

* In Description = Dry Wgt.

aw
5-11-05

SWS-201

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041041
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:35
Sample Matrix.....: Water

Laboratory Sample ID: 235828-12
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn

* In Description = Dry Wgt.

aw
5-11-05

SWS-201

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041041
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:35
Sample Matrix.....: Water

Laboratory Sample ID: 235828-12
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1500	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1500	jdn

* In Description = Dry Wgt.

aw
5-11-05

SWS-202

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: DU041042
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:45
Sample Matrix.....: Water

Laboratory Sample ID: 235828-13
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn

* In Description = Dry Wgt.

aw 5-11-05

SWS-202

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Job Number: 235828

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041042
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:45
Sample Matrix.....: Water

Laboratory Sample ID: 235828-13
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn

* In Description = Dry Wgt.

ajw
5-11-05

SWS-202

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR DU-04 ATTN: Keely Meadows

Customer Sample ID: OU041042
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:45
Sample Matrix.....: Water

Laboratory Sample ID: 235828-13
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1521	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1521	jdn

* In Description = Dry Wgt.

aw 5-11-05

SWS-203

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041043
Date Sampled.....: 04/14/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-14
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn

* In Description = Dry Wgt.

aW
5-11-05

SWS-203

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041043
Date Sampled.....: 04/14/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-14
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn

* In Description = Dry Wgt.

azw 5-11-05

SWS-203

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041043
Date Sampled.....: 04/14/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-14
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1543	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1543	jdn

* In Description = Dry Wgt.

aw 5-11-05

FD of SWS-203

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR DU-04 ATTN: Keely Meadows

Customer Sample ID: OU041044
Date Sampled.....: 04/14/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-15
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn

* In Description = Dry Wgt.

ATW
5-11-05

FD of SWS-203

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keety Meadows

Customer Sample ID: OU041044
Date Sampled.....: 04/14/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-15
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn

* In Description = Dry Wgt.

aw
5-11-05

FD of SWS-203

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Job Number: 235828

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-D4 ATTN: Keely Meadows

Customer Sample ID: DU041044
Date Sampled.....: 04/14/2005
Time Sampled.....: 09:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-15
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1605	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1605	jdn

* In Description = Dry Wgt.

aw
5-11-05

SWS-204

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041045
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-16
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn

* In Description = Dry Wgt.

aw
5-11-05

SWS-204

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235828

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AER OU-04 ATTN: Keety Meadows

Customer Sample ID: OU041045
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-16
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn

* In Description = Dry Wgt.

aw
5-11-05

SWS-204

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235828

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041045
Date Sampled.....: 04/14/2005
Time Sampled.....: 10:55
Sample Matrix.....: Water

Laboratory Sample ID: 235828-16
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1627	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1627	jdn

* In Description = Dry Wgt.

aw
5-11-05

SWS-205

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041046
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:50
Sample Matrix.....: Water

Laboratory Sample ID: 235828-17
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn

* In Description = Dry Wgt.

azo
5-11-05

SWS-205

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235828

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041046
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:50
Sample Matrix.....: Water

Laboratory Sample ID: 235828-17
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn

* In Description = Dry Wgt.

aw
5-11-05

SWS-205

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041046
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:50
Sample Matrix.....: Water

Laboratory Sample ID: 235828-17
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1649	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1649	jdn

* In Description = Dry Wgt.

aw 5-11-05

SWS-206

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041047
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:25
Sample Matrix.....: Water

Laboratory Sample ID: 235828-18
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Chloroethane	4.0			0.32	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Acetone	5.0	U	J	1.4	5.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,1-Dichloroethane	1.2			0.15	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	cis-1,2-Dichloroethene	0.64	J		0.20	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn

* In Description = Dry Wgt.

aro
5-11-05

SWS-206

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041047
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:25
Sample Matrix.....: Water

Laboratory Sample ID: 235828-18
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn

* In Description = Dry Wgt.

ajw 5-11-05

SWS-206

STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235828

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041047
Date Sampled.....: 04/14/2005
Time Sampled.....: 11:25
Sample Matrix.....: Water

Laboratory Sample ID: 235828-18
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1710	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1710	jdn

* In Description = Dry Wgt.

aw 5-11-05

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041050
Date Sampled.....: 04/14/2005
Time Sampled.....: 08:00
Sample Matrix.....: Water

Laboratory Sample ID: 235828-19
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	2,2-Dichloropropane	1.0	U	✓	0.17	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,1-Dichloropropene	1.0	U	✓	0.38	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn

* In Description = Dry Wgt.

aw
5-11-05

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041050
Date Sampled.....: 04/14/2005
Time Sampled.....: 08:00
Sample Matrix.....: Water

Laboratory Sample ID: 235828-19
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Toluene	0.64	J	B	0.18	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn

* In Description = Dry Wgt.

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5-11-05

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Job Number: 235828

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041050
Date Sampled.....: 04/14/2005
Time Sampled.....: 08:00
Sample Matrix.....: Water

Laboratory Sample ID: 235828-19
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1732	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1732	jdn

* In Description = Dry Wgt.

aw 5-1-05

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041051
Date Sampled.....: 04/15/2005
Time Sampled.....: 08:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-15
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk

* In Description = Dry Wgt.

AW 5-12-05

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041051
Date Sampled.....: 04/15/2005
Time Sampled.....: 08:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-15
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk

* In Description = Dry Wgt.

aw 5-12-05

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Job Number: 235857

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041051
Date Sampled.....: 04/15/2005
Time Sampled.....: 08:50
Sample Matrix.....: Water

Laboratory Sample ID: 235857-15
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/27/05 0103	mjk
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147234		04/27/05 0103	mjk

* In Description = Dry Wgt.

ADW 5-12-05

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR DU-04 ATTN: Keety Meadows

Customer Sample ID: DU041060
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235828-20
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 235828

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041060
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235828-20
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn

* In Description = Dry Wgt.

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Job Number: 235828

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AIR OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041060
Date Sampled.....: 04/14/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235828-20
Date Received.....: 04/15/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147485		04/28/05 1754	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147485		04/28/05 1754	jdn

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041061
Date Sampled.....: 04/15/2005
Time Sampled.....: 08:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-16
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Bromomethane	1.0	U		0.59	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Acetone	5.0	U		1.4	5.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Methylene chloride	6.1			0.24	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041061
Date Sampled.....: 04/15/2005
Time Sampled.....: 08:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-16
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk

* In Description = Dry Wgt.

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5-12-05

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LABORATORY TEST RESULTS

Job Number: 235857

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041061
Date Sampled.....: 04/15/2005
Time Sampled.....: 08:00
Sample Matrix.....: Water

Laboratory Sample ID: 235857-16
Date Received.....: 04/16/2005
Time Received.....: 08:50

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147234		04/27/05 0124	mjk
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147234		04/27/05 0124	mjk

* In Description = Dry Wgt.

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5-12-05

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LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: IN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041062
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-11
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Bromomethane	1.0	U	✓	0.59	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Acetone	5.0	U	✓	1.4	5.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Methylene chloride	1.0	U		0.24	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn

* In Description = Dry Wgt.

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5-16-05

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LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041062
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-11
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn

* In Description = Dry Wgt.

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5-16-05

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LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041062
Date Sampled.....: 04/19/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-11
Date Received.....: 04/20/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147667		05/03/05 0109	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147667		05/03/05 0109	jdn

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc.

PROJECT: SHAW AFB OU-04

ATTN: Keely Meadows

Customer Sample ID: OU041063
Date Sampled.....: 04/20/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-16
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Dichlorodifluoromethane	1.0	U		0.12	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Chloromethane	1.0	U		0.20	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Vinyl chloride	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Bromomethane	1.0	U	✗	0.59	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Chloroethane	1.0	U		0.32	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Trichlorofluoromethane	1.0	U		0.14	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,1-Dichloroethene	1.0	U		0.25	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Carbon disulfide	5.0	U		0.15	5.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Acetone	5.0	U	✗	1.4	5.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Methylene chloride	4.7			0.24	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	trans-1,2-Dichloroethene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Methyl-tert-butyl-ether (MTBE)	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,1-Dichloroethane	1.0	U		0.15	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	2,2-Dichloropropane	1.0	U		0.17	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	cis-1,2-Dichloroethene	1.0	U		0.20	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	2-Butanone (MEK)	5.0	U		1.0	5.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Bromochloromethane	1.0	U		0.27	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Chloroform	1.0	U		0.14	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,1,1-Trichloroethane	1.0	U		0.17	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,1-Dichloropropene	1.0	U		0.38	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Carbon tetrachloride	1.0	U		0.34	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Benzene	1.0	U		0.23	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2-Dichloroethane	1.0	U		0.25	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Trichloroethene	1.0	U		0.13	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2-Dichloropropane	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Dibromomethane	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Bromodichloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	cis-1,3-Dichloropropene	1.0	U		0.15	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 235920

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041063
Date Sampled.....: 04/20/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-16
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	4-Methyl-2-pentanone (MIBK)	5.0	U		0.92	5.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Toluene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	trans-1,3-Dichloropropene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,1,2-Trichloroethane	1.0	U		0.24	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Tetrachloroethene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,3-Dichloropropane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	2-Hexanone	5.0	U		0.99	5.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Dibromochloromethane	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2-Dibromoethane (EDB)	1.0	U		0.33	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Chlorobenzene	1.0	U		0.15	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,1,1,2-Tetrachloroethane	1.0	U		0.33	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Ethylbenzene	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	m&p-Xylenes	2.0	U		0.36	2.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	o-Xylene	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Styrene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Bromoform	1.0	U		0.32	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Isopropylbenzene	1.0	U		0.20	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Bromobenzene	1.0	U		0.22	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,1,2,2-Tetrachloroethane	1.0	U		0.34	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2,3-Trichloropropane	1.0	U		0.35	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	n-Propylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	2-Chlorotoluene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,3,5-Trimethylbenzene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	4-Chlorotoluene	1.0	U		0.18	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	tert-Butylbenzene	1.0	U		0.16	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2,4-Trimethylbenzene	1.0	U		0.26	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	sec-Butylbenzene	1.0	U		0.19	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,3-Dichlorobenzene	1.0	U		0.21	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	p-Isopropyltoluene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn

* In Description = Dry Wgt.

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STL Chicago is part of Severn Trent Laboratories, Inc.

Job Number: 235920

LABORATORY TEST RESULTS

Date:05/18/2005

CUSTOMER: TN & Associates, Inc. PROJECT: SHAW AFB OU-04 ATTN: Keely Meadows

Customer Sample ID: OU041063
Date Sampled.....: 04/20/2005
Time Sampled.....: 12:00
Sample Matrix.....: Water

Laboratory Sample ID: 235920-16
Date Received.....: 04/21/2005
Time Received.....: 09:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
	1,4-Dichlorobenzene	1.0	U		0.25	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	n-Butylbenzene	1.0	U		0.35	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2-Dichlorobenzene	1.0	U		0.29	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2-Dibromo-3-chloropropane	1.0	U		0.41	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2,4-Trichlorobenzene	1.0	U		0.36	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Hexachlorobutadiene	1.0	U		0.36	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Naphthalene	1.0	U		0.37	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	1,2,3-Trichlorobenzene	1.0	U		0.43	1.0	1.00000	ug/L	147667		05/03/05 0447	jdn
	Xylenes (total)	2.0	U		0.54	2.0	1.00000	ug/L	147667		05/03/05 0447	jdn

* In Description = Dry Wgt.

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5-16-05

APPENDIX C

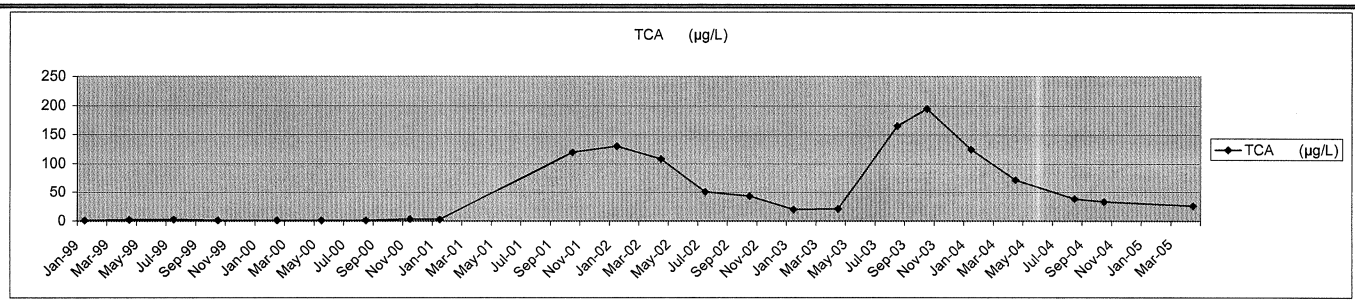
CALCULATION TABLES FOR MANN-KENDALL

Monitoring Well C-1

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	1.3	2	2.5	*1*	*1*	1.2	0.98	3.5	2.5	120	130	108	51	43	19.9	20.9	165	195	125	72	38.1	33	26			
		0.7	1.2	-0.3	-0.3	-0.1	-0.32	2.2	1.2	118.7	128.7	106.7	49.7	41.7	18.6	19.6	163.7	193.7	123.7	70.7	36.8	31.7	24.7	18	4	
			0.5	-1	-1	-0.8	-1.02	1.5	0.5	118	128	106	49	41	17.9	18.9	163	193	123	70	36.1	31	24	17	4	
				-1.5	-1.5	-1.3	-1.52	1	0	117.5	127.5	105.5	48.5	40.5	17.4	18.4	162.5	192.5	122.5	69.5	35.6	30.5	23.5	15	4	
					0	0.2	-0.02	2.5	1.5	119	129	107	50	42	18.9	19.9	164	194	124	71	37.1	32	25	17	1	
						0.2	-0.02	2.5	1.5	119	129	107	50	42	18.9	19.9	164	194	124	71	37.1	32	25	17	1	
							-0.22	2.3	1.3	118.8	128.8	106.8	49.8	41.8	18.7	19.7	163.8	193.8	123.8	70.8	36.9	31.8	24.8	16	1	
								2.52	1.52	119.02	129.02	107.02	50.02	42.02	18.92	19.92	164.02	194.02	124.02	71.02	37.12	32.02	25.02	16	0	
									-1	116.5	126.5	104.5	47.5	39.5	16.4	17.4	161.5	191.5	121.5	68.5	34.6	29.5	22.5	14	1	
										117.5	127.5	105.5	48.5	40.5	17.4	18.4	162.5	192.5	122.5	69.5	35.6	30.5	23.5	14	0	
											10	-12	-69	-77	-100.1	-99.1	45	75	5	-48	-81.9	-87	-94	4	9	
												-22	-79	-87	-110.1	-109.1	35	65	-5	-58	-91.9	-97	-104	2	10	
													-57	-65	-88.1	-87.1	57	87	17	-36	-69.9	-75	-82	3	8	
														-8	-31.1	-30.1	114	144	74	21	-12.9	-18	-25	4	6	
															-23.1	-22.1	122	152	82	29	-4.9	-10	-17	4	5	
																1	122	175.1	105.1	52.1	18.2	13.1	6.1	8	0	
																	144.1	174.1	104.1	51.1	17.2	12.1	5.1	7	0	
																		30	-40	-93	-126.9	-132	-139	1	5	
																			-70	-123	-156.9	-162	-169	0	5	
																				-53	-86.9	-92	-99	0	4	
																					-33.9	-39	-46	0	3	
																						-5.1	-12.1	0	2	
																							-7	0	1	
																								177	74	103

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 23
|S|= 103
p= < 0.005
α = 0.1
Results indicate a statistically significant increasing 1,1,1-Trichloroethane concentration trend based on the p value (p<a) and sing (+) of the S value.
Conclusion: Increasing trend is present.

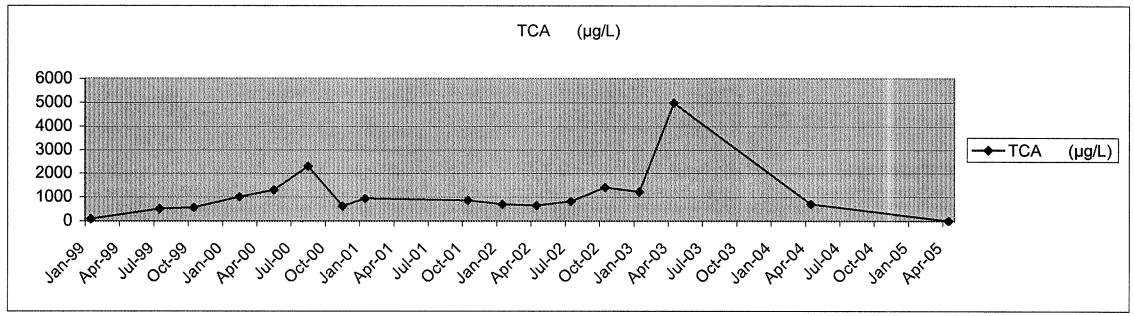
Notes:
1 Denotes detection limit value of a nondetect.



Monitoring Well C-2A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	90	510	560	1000	1300	2300	620	930	860	700	643	811	1400	1220	4990	700	0.5			
		420	470	910	1210	2210	530	840	770	610	553	721	1310	1130	4900	610	-89.5	15	1	
			50	490	790	1790	110	420	350	190	133	301	890	710	4480	190	-509.5	14	1	
				440	740	1740	60	370	300	140	83	251	840	660	4430	140	-559.5	13	1	
					300	1300	-380	-70	-140	-300	-357	-189	400	220	3990	-300	-999.5	5	8	
						1000	-680	-370	-440	-600	-657	-489	100	-80	3690	-600	-1299.5	3	9	
							-1680	-1370	-1440	-1600	-1657	-1489	-900	-1080	2690	-1600	-2299.5	1	10	
								310	240	80	23	191	780	600	4370	80	-619.5	9	1	
									-70	-230	-287	-119	470	290	4060	-230	-929.5	3	6	
										-160	-217	-49	540	360	4130	-160	-859.5	3	5	
											-57	111	700	520	4290	0	-699.5	4	2	
												168	757	577	4347	57	-642.5	5	1	
													589	409	4179	-111	-810.5	3	2	
														-180	3590	-700	-1399.5	1	3	
															3770	-520	-1219.5	1	2	
																-4290	-4989.5	0	2	
																	-699.5	0	1	
																		80	55	25

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 25
p = 0.071
α = 0.1
Results indicate a statistically significant increasing 1,1,1-Trichloroethane concentration trend based on the p value (p<a) and sign (+) of the S value.
Conclusion: Increasing trend is present.

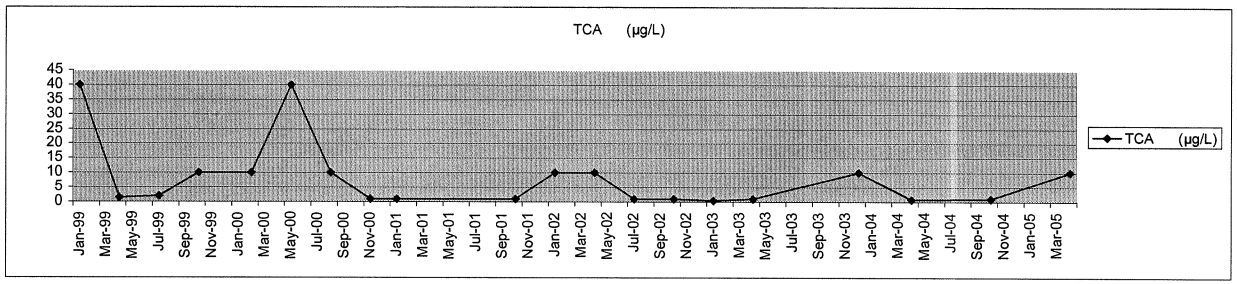


Monitoring Well C-3A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	*40*	1.4	*2*	*10*	*10*	*40*	*10*	*1*	*1*	*1*	*10*	*10*	*1*	*1*	0.411	*1*	*10*	0.809	*1*	10			
		-38.6	-38	-30	-30	0	-30	-39	-39	-39	-30	-30	-39	-39	-39.589	-39	-30	-39.191	-39	-30	0	18	
			0.6	8.6	8.6	38.6	8.6	-0.4	-0.4	-0.4	8.6	8.6	-0.4	-0.4	-0.989	-0.4	8.6	-0.591	-0.4	8.6	9	9	
				8	8	38	8	-1	-1	-1	8	8	-1	-1	-1.589	-1	8	-1.191	-1	8	8	9	
					0	30	0	-9	-9	-9	0	0	-9	-9	-9.589	-9	0	-9.191	-9	0	1	9	
						30	0	-9	-9	-9	0	0	-9	-9	-9.589	-9	0	-9.191	-9	0	1	9	
							-30	-39	-39	-39	-30	-30	-39	-39	-39.589	-39	-30	-39.191	-39	-30	0	14	
								-9	-9	-9	0	0	-9	-9	-9.589	-9	0	-9.191	-9	0	0	9	
									0	0	9	9	0	0	-0.589	0	9	-0.191	0	9	4	2	
										0	9	9	0	0	-0.589	0	9	-0.191	0	9	4	2	
											9	9	0	0	-0.589	0	9	-0.191	0	9	4	2	
												0	-9	-9	-9.589	-9	0	-9.191	-9	0	0	6	
													-9	-9	-9.589	-9	0	-9.191	-9	0	0	6	
														0	-0.589	0	9	-0.191	0	9	2	2	
															-0.589	0	9	-0.191	0	9	2	2	
																0.589	9.589	0.398	0.589	9.589	5	0	
																	9	-0.191	0	9	2	1	
																		-9.191	-9	0	0	2	
																			0.191	9.191	2	0	
																				9			
																					44	102	-58

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 18
|S|= *
p = *
α = 0.05
*1,1,1-TCA was detected in only 3 of the 18 sampling rounds; a Mann Kendall test is not necessary nor appropriate. Conclusion: No trend is discernible; all but 2 samples are nondetects.

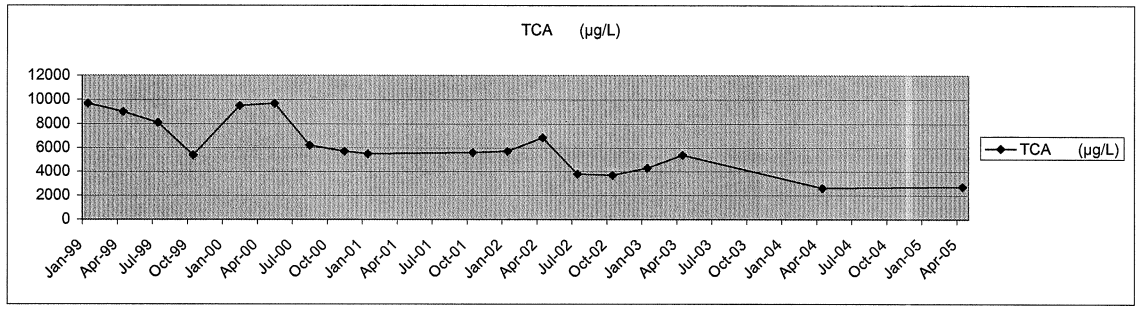
Notes:
40 Denotes detection limit value of a nondetect.



Monitoring Well C-4A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	9700	9000	8100	5400	9500	9700	6200	5700	5500	5600	5700	6860	3800	3700	4310	5400	2600	2700			
		-700	-1600	-4300	-200	0	-3500	-4000	-4200	-4100	-4000	-2840	-5900	-6000	-5390	-4300	-7100	-7000	0	16	
			-900	-3600	500	700	-2800	-3300	-3500	-3400	-3300	-2140	-5200	-5300	-4690	-3600	-6400	-6300	2	14	
				-2700	1400	1600	-1900	-2400	-2600	-2500	-2400	-1240	-4300	-4400	-3790	-2700	-5500	-5400	2	13	
					4100	4300	800	300	100	200	300	1460	-1600	-1700	-1090	0	-2800	-2700	8	5	
						200	-3300	-3800	-4000	-3900	-3800	-2640	-5700	-5800	-5190	-4100	-6900	-6800	1	12	
							-3500	-4000	-4200	-4100	-4000	-2840	-5900	-6000	-5390	-4300	-7100	-7000	0	12	
								-500	-700	-600	-500	660	-2400	-2500	-1890	-800	-3600	-3500	1	10	
									-200	-100	0	1160	-1900	-2000	-1390	-300	-3100	-3000	1	8	
										100	200	1360	-1700	-1800	-1190	-100	-2900	-2800	3	6	
											100	1260	-1800	-1900	-1290	-200	-3000	-2900	2	6	
												1160	-1900	-2000	-1390	-300	-3100	-3000	1	6	
													-3060	-3160	-2550	-1460	-4260	-4160	0	6	
														-100	510	1600	-1200	-1100	2	3	
															610	1700	-1100	-1000	2	2	
																1090	-1710	-1610	1	2	
																	-2800	-2700	0	2	
																		100	1	0	
																			27	123	-96

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 96
p = < 0.0005
α = 0.1
A statistically significant decreasing 1,1,1-TCA concentration trend is indicated based on the p value ($p<\alpha$) and the (-) sign of the S value.
Conclusion: Decreasing trend is present.



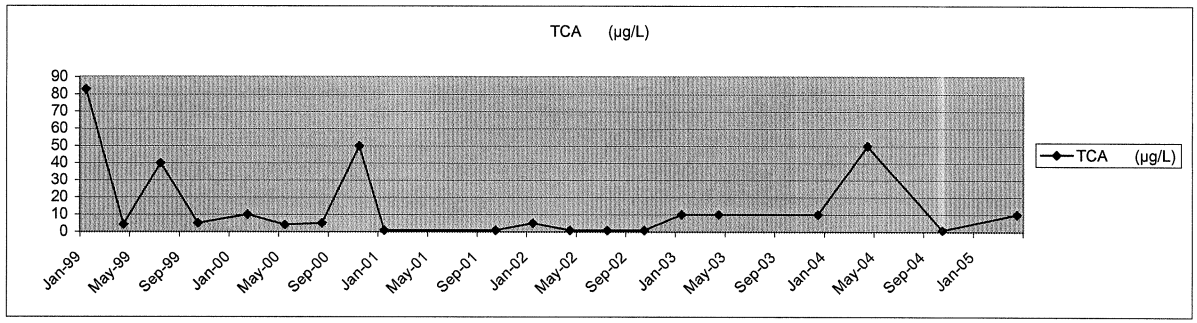
Monitoring Well C-5A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	83	4.3	*40*	*5*	*10*	*4*	*5*	*50*	*1*	*1*	*5*	*1*	*1*	*1*	*10*	*10*	*10*	*50*	*1*	*10*			
		-78.7	-43	-78	-73	-79	-78	-33	-82	-82	-78	-82	-82	-82	-73	-73	-73	-33	-82	-73	0	19	
			35.7	0.7	5.7	-0.3	0.7	45.7	-3.3	-3.3	0.7	-3.3	-3.3	-3.3	5.7	5.7	5.7	45.7	-3.3	5.7	11	7	
				-35	-30	-36	-35	10	-39	-39	-35	-39	-39	-39	-30	-30	-30	10	-39	-30	2	15	
					5	-1	0	45	-4	-4	0	-4	-4	-4	5	5	5	45	-4	5	7	7	
						-6	-5	40	-9	-9	-5	-9	-9	-9	0	0	0	40	-9	0	2	9	
							1	46	-3	-3	1	-3	-3	-3	6	6	6	46	-3	6	8	6	
								45	-4	-4	0	-4	-4	-4	5	5	5	45	-4	5	6	6	
									-49	-49	-45	-49	-49	-49	-40	-40	-40	0	-49	-40	0	11	
										0	4	0	0	0	9	9	9	49	0	9	6	0	
											4	0	0	0	9	9	9	49	0	9	6	0	
												-4	-4	-4	5	5	5	45	-4	5	5	4	
													0	0	9	9	9	49	0	9	5	0	
														0	9	9	9	49	0	9	5	0	
															9	9	9	49	0	9	5	0	
																0	0	40	-9	0	1	1	
																	0	40	-9	0	1	1	
																		40	-9	0	1	1	
																			-49	-40	0	2	
																				9	1	0	
																					72	89	-17

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 17
p = <0.0005
α = 0.05

A statistically significant decreasing concentration trend is indicated ($p<\alpha$). Because 1,1,1-TCA was detected in only 2 of the 20 sampling rounds and the detection limit values vary widely, the p value is highly uncertain. Conclusion: No trend may be concluded from the Mann Kendall results because of the relatively large number of nondetects; a decreasing trend may be qualitatively inferred from observation of the data.

Notes:
40 Denotes detection limit value of a nondetect.



Monitoring Well C-5B

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	*10*	*1*	*75*	*10*	*4*	*25*	*1*	*1*	*1*	*1*	0.44	*1*	0.304	*1*	*1*	1.62	0.658	5			
		-9	65	0	-6	15	-9	-9	-9	-9	-9.56	-9	-9.696	-9	-9	-8.38	-9.342	-5	2	14	
			74	9	3	24	0	0	0	0	-0.56	0	-0.696	0	0	0.62	-0.342	4	6	3	
				-65	-71	-50	-74	-74	-74	-74	-74.56	-74	-74.696	-74	-74	-73.38	-74.342	-70	0	15	
					-6	15	-9	-9	-9	-9	-9.56	-9	-9.696	-9	-9	-8.38	-9.342	-5	1	13	
						21	-3	-3	-3	-3	-3.56	-3	-3.696	-3	-3	-2.38	-3.342	1	2	11	
							-24	-24	-24	-24	-24.56	-24	-24.696	-24	-24	-23.38	-24.342	-20	0	12	
								0	0	0	-0.56	0	-0.696	0	0	0.62	-0.342	4	2	3	
									0	0	-0.56	0	-0.696	0	0	0.62	-0.342	4	2	3	
										0	-0.56	0	-0.696	0	0	0.62	-0.342	4	2	3	
											-0.56	0	-0.696	0	0	0.62	-0.342	4	2	3	
												0.56	-0.136	0.56	0.56	1.18	0.218	4.56	6	1	
													-0.696	0	0	0.62	-0.342	4	2	2	
														0.696	0.696	1.316	0.354	4.696	5	0	
															0	0.62	-0.342	4	2	1	
																0.62	-0.342	4	2	1	
																	-0.962	3.38	1	1	
																		4.342	1	0	
																			38	86	-48

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 57
p = 5.0E-03
α = 0.05
*1,1,1-TCA was detected in only 4 of the 17 sampling rounds; a Mann Kendall test is not necessary or appropriate.
Conclusion: No trend is discernible; all are nondetects except for 4 samples.

Notes:
10 Denotes detection limit value of a nondetect.

Monitoring Well C-5C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	7.5	6.5	9.3	14	19	21	12	9.1	5.5	4.6	5.5	6.84	7.12	6.5	7.33	7.23	2.91	0.5			
		-1	1.8	6.5	11.5	13.5	4.5	1.6	-2	-2.9	-2	-0.66	-0.38	-1	-0.17	-0.27	-4.59	-7	6	11	
			2.8	7.5	12.5	14.5	5.5	2.6	-1	-1.9	-1	0.34	0.62	0	0.83	0.73	-3.59	-6	10	5	
				4.7	9.7	11.7	2.7	-0.2	-3.8	-4.7	-3.8	-2.46	-2.18	-2.8	-1.97	-2.07	-6.39	-8.8	4	11	
					5	7	-2	-4.9	-8.5	-9.4	-8.5	-7.16	-6.88	-7.5	-6.67	-6.77	-11.09	-13.5	2	12	
						2	-7	-9.9	-13.5	-14.4	-13.5	-12.16	-11.88	-12.5	-11.67	-11.77	-16.09	-18.5	1	12	
							-9	-11.9	-15.5	-16.4	-15.5	-14.16	-13.88	-14.5	-13.67	-13.77	-18.09	-20.5	0	12	
								-2.9	-6.5	-7.4	-6.5	-5.16	-4.88	-5.5	-4.67	-4.77	-9.09	-11.5	0	11	
									-3.6	-4.5	-3.6	-2.26	-1.98	-2.6	-1.77	-1.87	-6.19	-8.6	0	10	
										-0.9	0	1.34	1.62	1	1.83	1.73	-2.59	-5	5	3	
											0.9	2.24	2.52	1.9	2.73	2.63	-1.69	-4.1	6	2	
												1.34	1.62	1	1.83	1.73	-2.59	-5	5	2	
													0.28	-0.34	0.49	0.39	-3.93	-6.34	3	3	
														-0.62	0.21	0.11	-4.21	-6.62	2	3	
															0.83	0.73	-3.59	-6	2	2	
																-0.1	-4.42	-6.83	0	3	
																	-4.32	-6.73	0	2	
																		-2.41	0	1	
																			46	105	-59

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 59
p= 0.032
α = 0.05
No statistically significant decreasing 1,1,1-TCA concentration trend is indicated ($p<\alpha$).
Conclusion: No decreasing (or increasing) trend is present.

Monitoring Well C-7A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05		Positive Values	Negative Values	S
TCA (µg/L)	2900	***100***	***100***	***4***	***20***	2	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***0.5***			
		-2800	-2800	-2896	-2880	-2898	-2899	-2899	-2899	-2899	-2899	-2899	-2899	-2899	-2899	-2899	-2899	-2899	-2899	-2899.5	0	19	
			0	-96	-80	-98	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99.5	0	17	
				-96	-80	-98	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99	-99.5	0	17	
					16	-2	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3.5	1	15	
						-18	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19.5	0	15	
							-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1.5	0	14	
								0	0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
									0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
										0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
											0	0	0	0	0	0	0	0	0	-0.5	0	1	
												0	0	0	0	0	0	0	0	-0.5	0	1	
													0	0	0	0	0	0	0	-0.5	0	1	
														0	0	0	0	0	0	-0.5	0	1	
															0	0	0	0	0	-0.5	0	1	
																0	0	0	0	-0.5	0	1	
																	0	0	0	-0.5	0	1	
																		0	0	-0.5	0	1	
																			0	-0.5	0	1	
																				-0.5	0	1	
																					1	110	-109

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 19
|S|= 109
p < 0.0005
α = 0.05

A statistically significant decreasing 1,1,1-TCA concentration trend is indicated (p<α). However, because a majority of the samples are nondetects, the p value is highly uncertain. Conclusion: No trend may be concluded from the Mann Kendall results, even though these results indicate a decreasing trend, because of the relatively large number of nondetects; a decreasing trend may be qualitatively inferred from observation of the data.

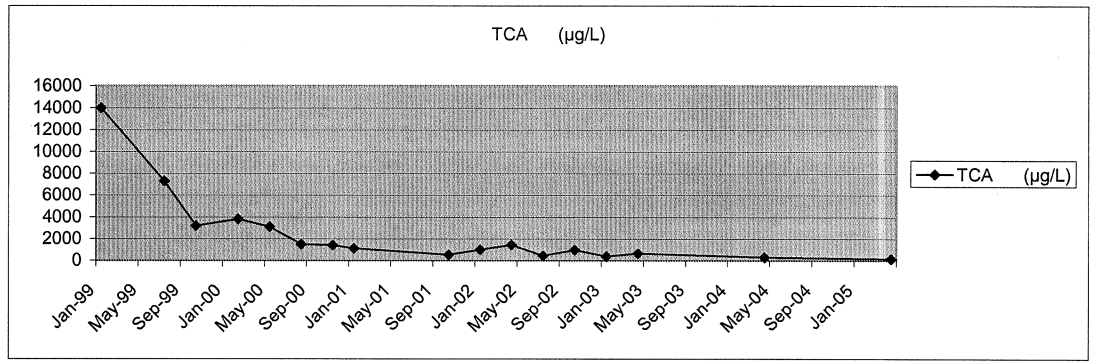
Notes:

100 Denotes detection limit value of a nondetect.

Monitoring Well C-8A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	14000	7300	3200	3800	3100	1500	1400	1100	520	990	1430	453	980	389	651	288	150			
		-6700	-10800	-10200	-10900	-12500	-12600	-12900	-13480	-13010	-12570	-13547	-13020	-13611	-13349	-13712	-13850	0	16	
			-4100	-3500	-4200	-5800	-5900	-6200	-6780	-6310	-5870	-6847	-6320	-6911	-6649	-7012	-7150	0	15	
				600	-100	-1700	-1800	-2100	-2680	-2210	-1770	-2747	-2220	-2811	-2549	-2912	-3050	1	13	
					-700	-2300	-2400	-2700	-3280	-2810	-2370	-3347	-2820	-3411	-3149	-3512	-3650	0	13	
						-1600	-1700	-2000	-2580	-2110	-1670	-2647	-2120	-2711	-2449	-2812	-2950	0	12	
							-100	-400	-980	-510	-70	-1047	-520	-1111	-849	-1212	-1350	0	11	
								-300	-880	-410	30	-947	-420	-1011	-749	-1112	-1250	1	9	
									-580	-110	330	-647	-120	-711	-449	-812	-950	1	8	
										470	910	-67	460	-131	131	-232	-370	4	4	
											440	-537	-10	-601	-339	-702	-840	1	6	
												-977	-450	-1041	-779	-1142	-1280	0	6	
													527	-64	198	-165	-303	2	3	
														-591	-329	-692	-830	0	4	
															262	-101	-239	1	2	
																-363	-501	0	2	
																	-138	0	1	
																		11	125	-114

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 114
p < 0.0010
α = 0.1
A statistically significant decreasing 1,1,1-TCA concentration trend is indicated based on the p value ($p<\alpha$) and (-) sign of the S value.
Conclusion: Decreasing trend is present.



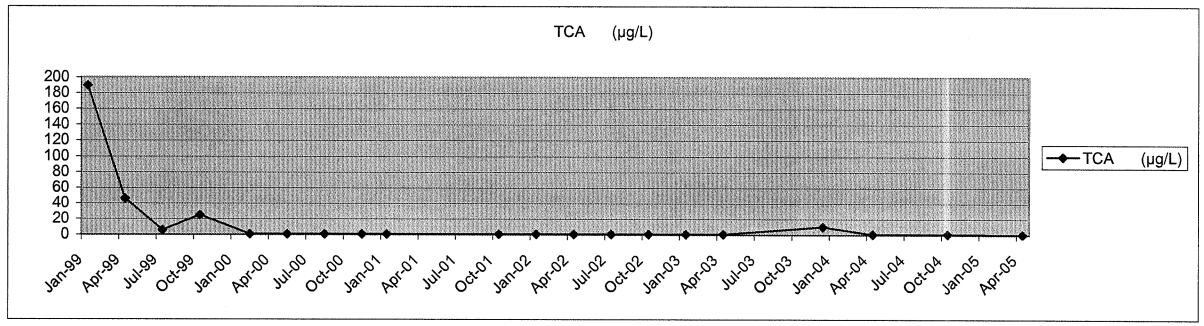
Monitoring Well C-9A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	190	46	5.7	*25*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*10*	*1*	*1*	*0.5*			
		-144	-184.3	-165	-189	-189	-189	-189	-189	-189	-189	-189	-189	-189	-189	-189	-180	-189	-189	-189.5	0	19	
			-40.3	-21	-45	-45	-45	-45	-45	-45	-45	-45	-45	-45	-45	-45	-36	-45	-45	-45.5	0	18	
				19.3	-4.7	-4.7	-4.7	-4.7	-4.7	-4.7	-4.7	-4.7	-4.7	-4.7	-4.7	-4.7	4.3	-4.7	-4.7	-5.2	2	15	
					-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-24	-15	-24	-24	-24.5	0	16	
						0	0	0	0	0	0	0	0	0	0	0	9	0	0	-0.5	1	1	
							0	0	0	0	0	0	0	0	0	0	9	0	0	-0.5	1	1	
								0	0	0	0	0	0	0	0	0	9	0	0	-0.5	1	1	
									0	0	0	0	0	0	0	0	9	0	0	-0.5	1	1	
										0	0	0	0	0	0	0	9	0	0	-0.5	1	1	
											0	0	0	0	0	0	9	0	0	-0.5	1	1	
												0	0	0	0	0	9	0	0	-0.5	1	1	
													0	0	0	0	9	0	0	-0.5	1	1	
														0	0	0	9	0	0	-0.5	1	1	
															0	0	9	0	0	-0.5	1	1	
																0	9	0	0	-0.5	1	1	
																	9	0	0	-0.5	1	1	
																		-9	-9	-9.5	0	3	
																			0	-0.5	0	1	
																				-0.5	0	1	
																					14	85	-71

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 71
p = 0.009
α = 0.05

A statistically significant decreasing 1,1,1-TCA concentration trend is indicated ($p<\alpha$) if nondetects are assumed to be present at the detection limits. Even though a majority of the samples are nondetects, which casts uncertainty on the p value, the magnitude of the detected values in comparison to that of the detection limits adds validity to the Mann Kendall results. Conclusion: A decreasing trend is present.

Notes:
25 Denotes detection limit value of a nondetect.



Monitoring Well C-9B

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	40	***2***	***5***	***1***	2.3	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***0.5***			
		-38	-35	-39	-37.7	-39	-39	-39	-39	-39	-39	-39	-39	-39	-39	-39	-39.5	0	16	
			3	-1	0.3	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1.5	2	13	
				-4	-2.7	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4.5	0	14	
					1.3	0	0	0	0	0	0	0	0	0	0	0	-0.5	1	1	
						-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.3	-1.8	0	12	
							0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
								0	0	0	0	0	0	0	0	0	-0.5	0	1	
									0	0	0	0	0	0	0	0	-0.5	0	1	
										0	0	0	0	0	0	0	-0.5	0	1	
											0	0	0	0	0	0	-0.5	0	1	
												0	0	0	0	0	-0.5	0	1	
													0	0	0	0	-0.5	0	1	
														0	0	0	-0.5	0	1	
															0	0	-0.5	0	1	
																0	-0.5	0	1	
																	-0.5	0	1	
																		3	67	-64

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 16
|S|= 64
p = 0.0155
α = 0.05

A statistically significant decreasing 1,1,1-TCA concentration trend is indicated ($p<\alpha$). However, because a majority of the samples are nondetects and the detection limits vary, the p value is highly uncertain. Conclusion: No trend can be concluded from the Mann Kendall results, even though these results indicate a decreasing trend, because of the relatively large number of nondetects; a decreasing trend may be qualitatively inferred from observation of the data.

Notes:

2 Denotes detection limit value of a nondetect.

Monitoring Well C-9C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	1	4.2	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*0.5*			
		3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.5	1	1	
			-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.7	0	16	
				0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
					0	0	0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
						0	0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
							0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
								0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
									0	0	0	0	0	0	0	0	0	-0.5	0	1	
										0	0	0	0	0	0	0	0	-0.5	0	1	
											0	0	0	0	0	0	0	-0.5	0	1	
												0	0	0	0	0	0	-0.5	0	1	
													0	0	0	0	0	-0.5	0	1	
														0	0	0	0	-0.5	0	1	
															0	0	0	-0.5	0	1	
																0	0	-0.5	0	1	
																	0	-0.5	0	1	
																		-0.5	0	1	
																			1	32	-31

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 31
p = *
α = 0.05
Because 1,1,1-TCA was not detected in the last 15 sampling rounds, a Mann Kendall Test is not necessary nor appropriate.
Conclusion: A majority of the samples are nondetects; no trend is discernible.

Notes:
1 Denotes detection limit value of a nondetect.

Monitoring Well C-10

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*			
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
									0	0	0	0	0	0	0	0	0	0	0	0	0	0	
										0	0	0	0	0	0	0	0	0	0	0	0	0	
											0	0	0	0	0	0	0	0	0	0	0	0	
												0	0	0	0	0	0	0	0	0	0	0	
													0	0	0	0	0	0	0	0	0	0	
														0	0	0	0	0	0	0	0	0	
															0	0	0	0	0	0	0	0	
																0	0	0	0	0	0	0	
																	0	0	0	0	0	0	
																		0	0	0	0	0	
																			0	0	0	0	
																				0	0	0	
																					0	0	0

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 20
|S|= *
p = *
α = 0.1
*1,1,1-TCA was not detected in any of the 20 samples; therefore, a Kendall-Mann test is not necessary nor appropriate. Conclusion: No trend is discernible; all samples are nondetects.

Notes:
1 Denotes detection limit value of a nondetect.

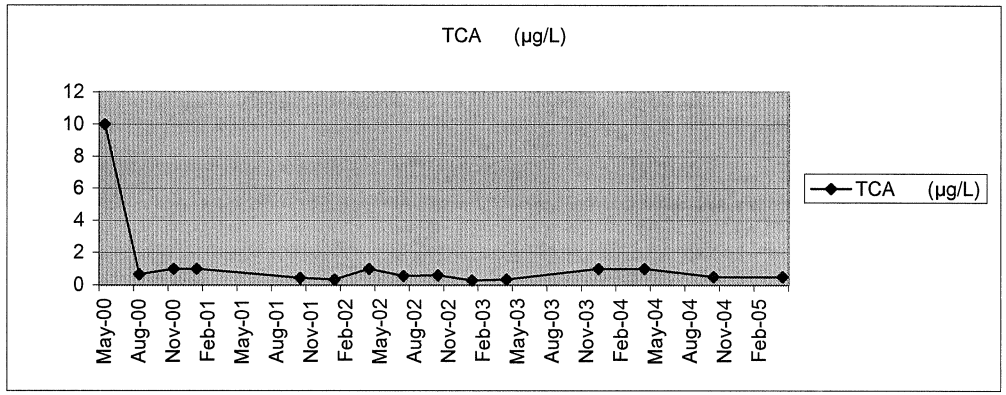
Monitoring Well C-11

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	***10***	0.66	***1***	***1***	0.43	0.34	***1***	0.554	0.59	0.287	0.332	***1***	***1***	***0.5***	***0.5***			
			0.34	0.34	-0.23	-0.32	0.34	-0.106	-0.07	-0.373	-0.328	0.34	0.34	-0.16	-0.16	5	8	
				0	-0.57	-0.66	0	-0.446	-0.41	-0.713	-0.668	0	0	-0.5	-0.5	0	8	
					-0.57	-0.66	0	-0.446	-0.41	-0.713	-0.668	0	0	-0.5	-0.5	0	8	
						-0.09	0.57	0.124	0.16	-0.143	-0.098	0.57	0.57	0.07	0.07	7	3	
							0.66	0.214	0.25	-0.053	-0.008	0.66	0.66	0.16	0.16	7	2	
								-0.446	-0.41	-0.713	-0.668	0	0	-0.5	-0.5	0	6	
									0.036	-0.267	-0.222	0.446	0.446	-0.054	-0.054	3	4	
										-0.303	-0.258	0.41	0.41	-0.09	-0.09	2	4	
											0.045	0.713	0.713	0.213	0.213	5	0	
												0.668	0.668	0.168	0.168	4	0	
													0	-0.5	-0.5	0	2	
														-0.5	-0.5	0	2	
															0	0	0	
																28	31	-3

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 3
p = 0.219
α = 0.05

No trend is indicated by the Mann Kendall results ($p>\alpha$). Note that the nondetect sample collected in May 2000 was not used in this evaluation because the detection limit was elevated with respect to the rest of the samples. Also, the relatively large number of nondetects and the concentrations of the other samples at concentrations less than the detection limits cast much uncertainty on the p value.
Conclusion: No trend is discernible.

Notes:
10 Denotes detection limit value of a nondetect.



Monitoring Well C-12

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*			
		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	
			0	0	0	0	0	0	0	0	0	0	0		0	0	0	
				0	0	0	0	0	0	0	0	0	0		0	0	0	
					0	0	0	0	0	0	0	0	0		0	0	0	
						0	0	0	0	0	0	0	0		0	0	0	
							0	0	0	0	0	0	0		0	0	0	
								0	0	0	0	0	0		0	0	0	
									0	0	0	0	0		0	0	0	
										0	0	0	0		0	0	0	
											0	0	0		0	0	0	
												0	0		0	0	0	
													0		0	0	0	
															0	0	0	
																0	0	0

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 13
|S|= *
p = *
α = 0.05
*1,1,1-TCA was not detected in any of the 13 samples; therefore, a Kendall-Mann test is not necessary nor appropriate. Conclusion: No trend is discernible; all samples are nondetects.

Notes:

1 Denotes detection limit value of a nondetect.

Monitoring Well C-13

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	***20***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***5***			
		-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19		-15	0	13	
			0	0	0	0	0	0	0	0	0	0	0		4	1	0	
				0	0	0	0	0	0	0	0	0	0		4	1	0	
					0	0	0	0	0	0	0	0	0		4	1	0	
						0	0	0	0	0	0	0	0		4	1	0	
							0	0	0	0	0	0	0		4	1	0	
								0	0	0	0	0	0		4	1	0	
									0	0	0	0	0		4	1	0	
										0	0	0	0		4	1	0	
											0	0	0		4	1	0	
												0	0		4	1	0	
													0		4	1	0	
															4	1	0	
																12	13	-1

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 13
|S|= *
p = *
α = 0.05
*1,1,1-TCA was not detected in any of the 13 samples; therefore, a Kendall-Mann test is not necessary nor appropriate. Conclusion: No trend is discernible; all samples are nondetects.

Notes:

20 Denotes detection limit value of a nondetect.

Monitoring Well C-14

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*5*	*1*	*1*			
		0	0	0	0	0	0	0	0	0	0	0	4		0	1	0	
			0	0	0	0	0	0	0	0	0	0	4		0	1	0	
				0	0	0	0	0	0	0	0	0	4		0	1	0	
					0	0	0	0	0	0	0	0	4		0	1	0	
						0	0	0	0	0	0	0	4		0	1	0	
							0	0	0	0	0	0	4		0	1	0	
								0	0	0	0	0	4		0	1	0	
									0	0	0	0	4		0	1	0	
										0	0	0	4		0	1	0	
											0	0	4		0	1	0	
												0	4		0	1	0	
													4		0	1	0	
															-4	0	1	
																12	1	11

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= *
p = *
α = 0.05
*1,1,1-TCA was not detected in any of the samples; therefore, a Mann-Kendall test is not necessary nor appropriate. Conclusion: No trend is discernible; all samples are nondetects.

Notes:
1 Denotes detection limit value of a nondetect.

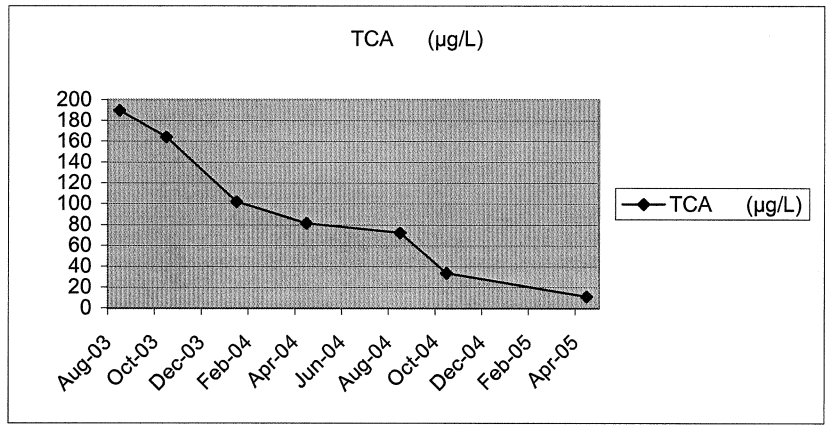
Monitoring Well C-15

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
TCA (µg/L)	190	164	102	81.6	72.3	33.5	11							
		-26	-88	-108.4	-117.7	-156.5	-179					0	6	
			-62	-82.4	-91.7	-130.5	-153					0	5	
				-20.4	-29.7	-68.5	-91					0	4	
					-9.3	-48.1	-70.6					0	3	
						-38.8	-61.3					0	2	
							-22.5					0	1	
												0	21	-21

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 17
p 0.0005
α = 0.05

A statistically significant decreasing 1,1,1-TCA concentration trend is indicated based on the p value ($p<\alpha$) and (-) sign of the S value.
Conclusion: A decreasing trend is present.

Notes:



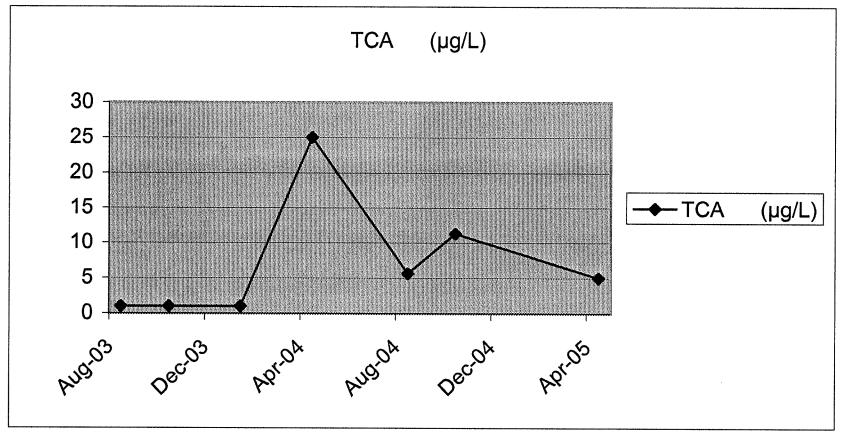
Monitoring Well C-16

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
TCA (µg/L)	*1*	*1*	*1*	*25*	*5.64*	11.3	*5*							
		0	0	24	4.64	10.3	4					4	0	
			0	24	4.64	10.3	4					4	0	
				24	4.64	10.3	4					4	0	
					-19.36	-13.7	-20					0	3	
						5.66	-0.64					1	1	
							-6.3					0	1	
												13	5	8

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 8
p = *
α = 0.05

Conclusion: No trend is discernible; Six of the seven samples are nondetects.

Notes:



Monitoring Well C-17

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
TCA (µg/L)	***1***	***1***	0.871	1.17	***1***	2.02	***2.5***							
		0	-0.129	0.17	0	1.02	1.5					3	1	
			-0.129	0.17	0	1.02	1.5					3	1	
				0.299	0.129	1.149	1.629					4	0	
					-0.17	0.85	1.33					2	1	
						1.02	1.5							
							0.48							
												12	3	9

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 9
p = 0.3
α = 0.05

Because 1,1,1-TCA was only detected in 3 of the 7 sampling rounds, it casts uncertainty to the p value;

Conclusion: No trend is discernible.

Notes:

Monitoring Well C-18

DATE	Aug-03	Oct-03	Jan-03	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
TCA (µg/L)	5.8	0.726	*1*	*1*	*1*	*1*	*0.5*							
		-5.074	-4.8	-4.8	-4.8	-4.8	-5.3					0	6	
			0.274	0.274	0.274	0.274	-0.226					4	1	
				0	0	0	-0.5					0	1	
					0	0	-0.5					0	1	
						0	-0.5					0	1	
							-0.5					0	1	
												4	11	-7

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 7
p = 0.75
α = 0.05

No statistically significant 1,1-DCA concentration trend is indicated ($p>\alpha$). Because 1,1,1-TCA was only detected in 2 of the 7 sampling rounds, it casts uncertainty to the p value.
Conclusion: No trend is discernible.

Notes:

Monitoring Well C-19

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
TCA (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	*0.5*							
		0	0	0	0	0	-0.5					0	1	
			0	0	0	0	-0.5					0	1	
				0	0	0	-0.5					0	1	
					0	0	-0.5					0	1	
						0	-0.5					0	1	
							-0.5					0	1	
												0	6	-6

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 4
|S|= *
p = *
α = 0.05

*1,1,1-TCA was not detected in any of the samples; therefore, a Mann-Kendall test is not necessary nor appropriate.
Conclusion: No trend is present.

Notes:

Monitoring Well C-20

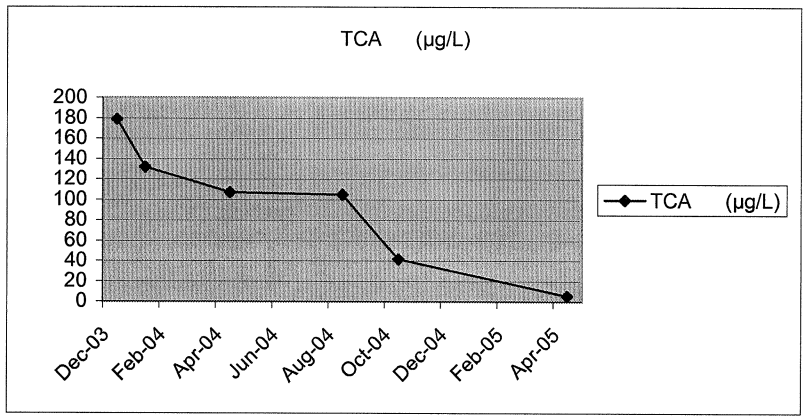
DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
TCA (µg/L)	179	132	107	105	41.6	5.3								
		-47	-72	-74	-137.4	-173.7						0	5	
			-25	-27	-90.4	-126.7						0	4	
				-2	-65.4	-101.7						0	3	
					-63.4	-99.7						0	2	
						-36.3						0	1	
												0	15	-15

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 6
|S|= 15
p = <0.0005
α = 0.05

Results indicate a statistically significant decreasing 1,1,1-Trichloroethane concentration trend based on the p value (p<a) and sign (-) of the S value.

Conclusion: A decreasing trend is present.

Notes:



Monitoring Well C-21

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
TCA (µg/L)	179	*1*	107	*1*	*1*	*1*								
		-178	-72	-178	-178	-178						0	5	
			106	0	0	0						1	0	
				-106	-106	-106						0	3	
					0	0						0	0	
						0						0	0	
												1	8	-7

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 6
|S|= 7
p = 1
α = 0.05

Because only 2 of the 6 samples are detected, it casts uncertainty in the p value result.
Conclusion: No trend is present.

Notes:

Monitoring Well MW-105

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*0.5*			
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
				0	0	0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
					0	0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
						0	0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
							0	0	0	0	0	0	0	0	0	0	-0.5	0	1	
								0	0	0	0	0	0	0	0	0	-0.5	0	1	
									0	0	0	0	0	0	0	0	-0.5	0	1	
										0	0	0	0	0	0	0	-0.5	0	1	
											0	0	0	0	0	0	-0.5	0	1	
												0	0	0	0	0	-0.5	0	1	
													0	0	0	0	-0.5	0	1	
														0	0	0	-0.5	0	1	
															0	0	-0.5	0	1	
																0	-0.5	0	1	
																	-0.5	0	1	
																		0	16	-16

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 14
|S|= *
p = *
α = 0.1

*Analyte was not detected in any sample; Mann-Kendall Test is not necessary nor appropriate.
Conclusion: No trend is discernible.

Notes:
1 Denotes detection limit value of a nondetect.

Monitoring Well MW-112

DATE	Jan-99	Feb-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05				Positive Values	Negative Values	S
TCA (µg/L)	*5*	*25*	*1*	*1*	*1*	*5*	*0.5*						
		20	-4	-4	-4	0	-4.5				1	4	
			-24	-24	-24	-20	-24.5				0	5	
				0	0	4	-0.5				1	1	
					0	4	-0.5				1	1	
						4	-0.5				1	1	
							-4.5				0	1	
											4	13	-9

Ho = No concentration trend is present.

H_1 = A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

|S|= 9

p = *

α = 0.1

*Analyte was not detected in any sample; Mann-Kendall Test is not necessary nor appropriate.

Conclusion: No trend is discernible.

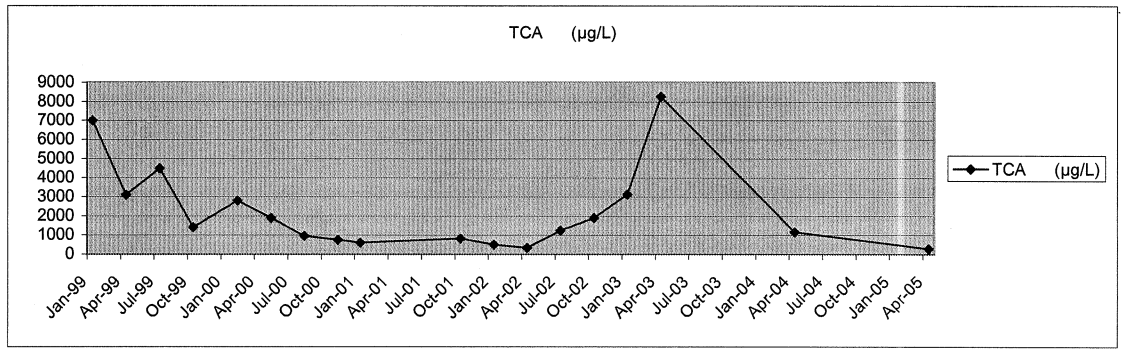
Notes:

5 Denotes detection limit value of a nondetect.

Monitoring Well MW-117

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
TCA (µg/L)	7000	3100	4500	1400	2800	1900	960	760	610	820	510	327	1240	1900	3110	8260	1150	280			
		-3900	-2500	-5600	-4200	-5100	-6040	-6240	-6390	-6180	-6490	-6673	-5760	-5100	-3890	1260	-5850	-6720	1	16	
			1400	-1700	-300	-1200	-2140	-2340	-2490	-2280	-2590	-2773	-1860	-1200	10	5160	-1950	-2820	3	13	
				-3100	-1700	-2600	-3540	-3740	-3890	-3680	-3990	-4173	-3260	-2600	-1390	3760	-3350	-4220	1	14	
					1400	500	-440	-640	-790	-580	-890	-1073	-160	500	1710	6860	-250	-1120	5	9	
						-900	-1840	-2040	-2190	-1980	-2290	-2473	-1560	-900	310	5460	-1650	-2520	2	11	
							-940	-1140	-1290	-1080	-1390	-1573	-660	0	1210	6360	-750	-1620	2	9	
								-200	-350	-140	-450	-633	280	940	2150	7300	190	-680	5	6	
									-150	60	-250	-433	480	1140	2350	7500	390	-480	6	4	
										210	-100	-283	630	1290	2500	7650	540	-330	6	3	
											-310	-493	420	1080	2290	7440	330	-540	5	3	
												-183	730	1390	2600	7750	640	-230	5	2	
													913	1573	2783	7933	823	-47	5	1	
														660	1870	7020	-90	-960	3	2	
															1210	6360	-750	-1620	2	2	
																5150	-1960	-2830	1	2	
																	-7110	-7980	0	2	
																		-870	0	1	
																			52	100	-48

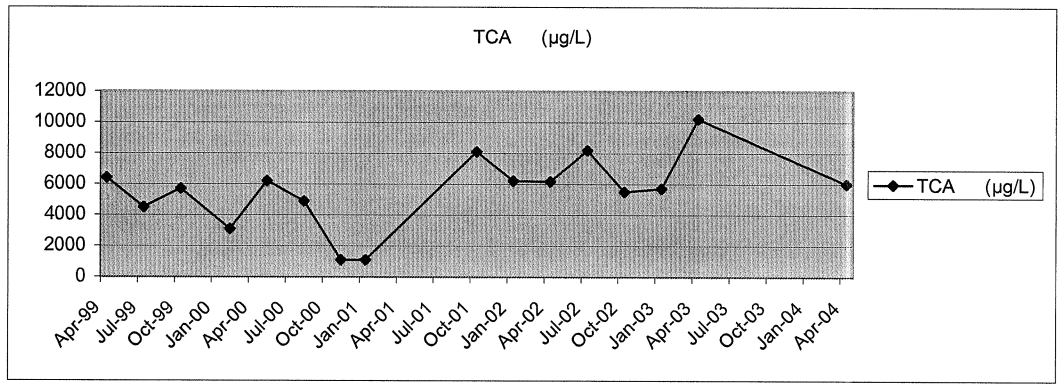
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 48
p = 0.220
α = 0.1
No statistically significant 1,1,1-TCA concentration trend is indicated ($p>\alpha$).
Conclusion: No trend is present.



Monitoring Well MW-120

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Positive Values	Negative Values	S
TCA (µg/L)	6400	4500	5700	3100	6200	4900	1100	1100	8100	6200	6150	8170	5500	5700	10200	5990			
		-1900	-700	-3300	-200	-1500	-5300	-5300	1700	-200	-250	1770	-900	-700	3800	-410	3	12	
			1200	-1400	1700	400	-3400	-3400	3600	1700	1650	3670	1000	1200	5700	1490	11	3	
				-2600	500	-800	-4600	-4600	2400	500	450	2470	-200	0	4500	290	7	5	
					3100	1800	-2000	-2000	5000	3100	3050	5070	2400	2600	7100	2890	10	2	
						-1300	-5100	-5100	1900	0	-50	1970	-700	-500	4000	-210	3	7	
							-3800	-3800	3200	1300	1250	3270	600	800	5300	1090	8	2	
								0	7000	5100	5050	7070	4400	4600	9100	4890	8	0	
									7000	5100	5050	7070	4400	4600	9100	4890	8	0	
										-1900	-1950	70	-2600	-2400	2100	-2110	2	5	
											-50	1970	-700	-500	4000	-210	2	4	
												2020	-650	-450	4050	-160	2	3	
													-2670	-2470	2030	-2180	1	3	
														200	4700	490	3	0	
															4500	290	2	0	
																-4210	0	1	
																	70	47	23

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 23
p = 0.328
α = 0.1
No statistically significant 1,1,1-TCA concentration trend is indicated ($p>\alpha$).
Conclusion: No trend is present.



Monitoring Well MW-122A

DATE	Oct-99	Aug-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05				Positive Values	Negative Values	S
TCA (µg/L)	*100*	*25*	*1*	*10*	*1*	*10*	*0.5*						
		-75	-99	-90	-99	-90	-99.5				0	6	
			-24	-15	-24	-15	-24.5				0	5	
				9	0	9	-0.5				2	1	
					-9	0	-9.5				0	2	
						9	-0.5				1	1	
							-9.5				0	1	
											3	16	-13

Ho = No concentration trend is present.

H_1 = A concentration trend is present (its direction is dependent upon the sign of S).

n = 5

|S|= 13

p = *

α = 0.1

* Analyte was not detected in any of the samples; Mann-Kendall Test is not necessary nor appropriate.

Conclusion: No trend is present.

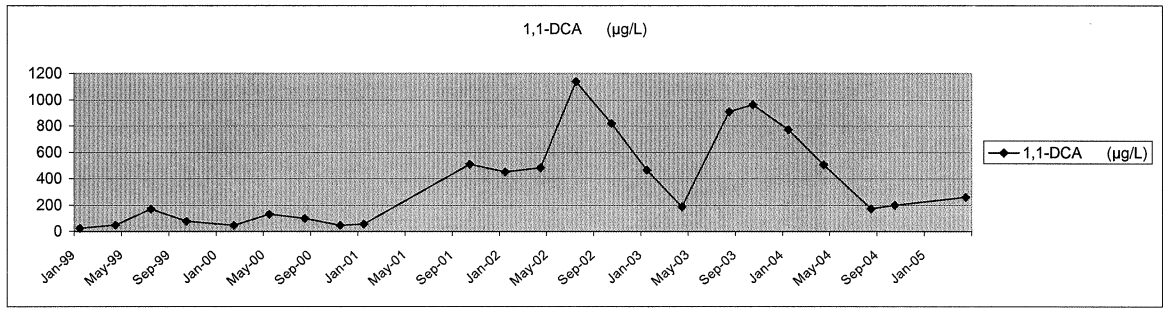
Notes:

100 Denotes detection limit value of a nondetect.

Monitoring Well C-1

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	25	49	170	77	46	130	100	45	55	510	450	483	1140	820	466	186	908	962	772	504	173	198	260			
		24	145	52	21	105	75	20	30	485	425	458	1115	795	441	161	883	937	747	479	148	173	235	22	0	
			121	28	-3	81	51	-4	6	461	401	434	1091	771	417	137	859	913	723	455	124	149	211	19	2	
				-93	-124	-40	-70	-125	-115	340	280	313	970	650	296	16	738	792	602	334	3	28	90	14	6	
					-31	53	23	-32	-22	433	373	406	1063	743	389	109	831	885	695	427	96	121	183	16	3	
						84	54	-1	9	464	404	437	1094	774	420	140	862	916	726	458	127	152	214	17	1	
							-30	-85	-75	380	320	353	1010	690	336	56	778	832	642	374	43	68	130	14	3	
								-55	-45	410	350	383	1040	720	366	86	808	862	672	404	73	98	160	14	2	
									10	465	405	438	1095	775	421	141	863	917	727	459	128	153	215	15	0	
										455	395	428	1085	765	411	131	853	907	717	449	118	143	205	14	0	
											-60	-27	630	310	-44	-324	398	452	262	-6	-337	-312	-250	5	8	
												33	690	370	16	-264	458	512	322	54	-277	-252	-190	8	4	
													657	337	-17	-297	425	479	289	21	-310	-285	-223	6	5	
														-320	-674	-954	-232	-178	-368	-636	-967	-942	-880	0	10	
															-354	-634	88	142	-48	-316	-647	-622	-560	2	7	
																-280	442	496	306	38	-293	-268	-206	4	4	
																	722	776	586	318	-13	12	74	6	1	
																		54	-136	-404	-735	-710	-648	1	5	
																			-190	-458	-789	-764	-702	0	5	
																				-268	-599	-574	-512	0	4	
																					-331	-306	-244	0	3	
																						25	87	2	0	
																							62	1	0	
																								139	71	68

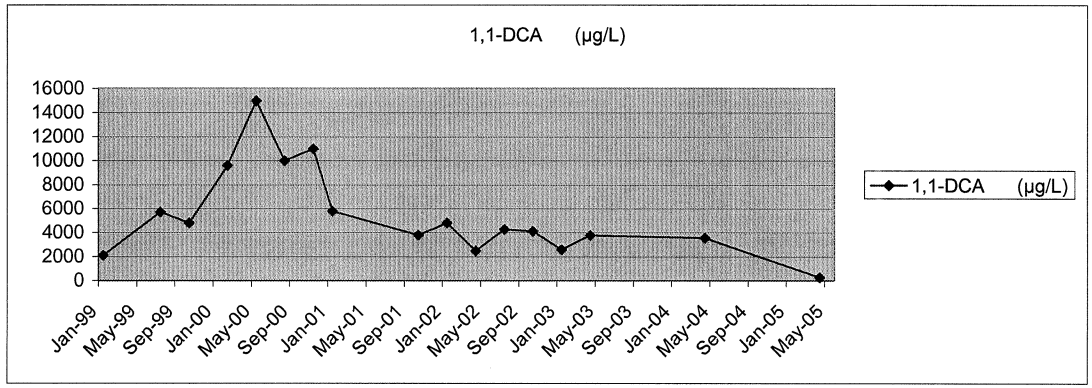
H_0 = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 23
|S|= 68
p < 0.0005
α = 0.1
A statistically significant increasing 1,1-DCA concentration trend is indicated based on the p value ($p<\alpha$) and (+) sign of the S value.
Conclusion: Increasing trend is present.



Monitoring Well C-2A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	2100	5700	4800	9600	15000	10000	11000	5800	3800	4800	2480	4270	4100	2590	3760	3550	270			
		3600	2700	7500	12900	7900	8900	3700	1700	2700	380	2170	2000	490	1660	1450	-1830	15	1	
			-900	3900	9300	4300	5300	100	-1900	-900	-3220	-1430	-1600	-3110	-1940	-2150	-5430	5	10	
				4800	10200	5200	6200	1000	-1000	0	-2320	-530	-700	-2210	-1040	-1250	-4530	5	8	
					5400	400	1400	-3800	-5800	-4800	-7120	-5330	-5500	-7010	-5840	-6050	-9330	3	10	
						-5000	-4000	-9200	-11200	-10200	-12520	-10730	-10900	-12410	-11240	-11450	-14730	0	12	
							1000	-4200	-6200	-5200	-7520	-5730	-5900	-7410	-6240	-6450	-9730	1	10	
								-5200	-7200	-6200	-8520	-6730	-6900	-8410	-7240	-7450	-10730	0	10	
									-2000	-1000	-3320	-1530	-1700	-3210	-2040	-2250	-5530	0	9	
										1000	-1320	470	300	-1210	-40	-250	-3530	3	5	
											-2320	-530	-700	-2210	-1040	-1250	-4530	0	7	
												1790	1620	110	1280	1070	-2210	5	1	
													-170	-1680	-510	-720	-4000	0	5	
														-1510	-340	-550	-3830	0	4	
															1170	960	-2320	2	1	
																-210	-3490	0	2	
																	-3280	0	1	
																		39	96	-57

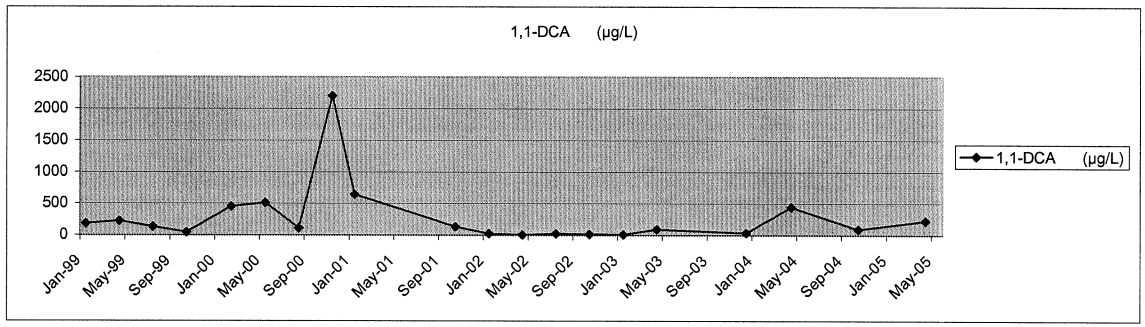
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 57
p = 0.071
α = 0.1
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value ($p<\alpha$) and (-) sign of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-3A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	180	220	130	46	450	510	110	2200	640	130	25	6.33	23.5	14	10.5	89.1	34.6	440	92	220			
		40	-50	-134	270	330	-70	2020	460	-50	-155	-173.67	-156.5	-166	-169.5	-90.9	-145.4	260	-88	40	7	12	
			-90	-174	230	290	-110	1980	420	-90	-195	-213.67	-196.5	-206	-209.5	-130.9	-185.4	220	-128	0	5	12	
				-84	320	380	-20	2070	510	0	-105	-123.67	-106.5	-116	-119.5	-40.9	-95.4	310	-38	90	6	10	
					404	464	64	2154	594	84	-21	-39.67	-22.5	-32	-35.5	43.1	-11.4	394	46	174	10	6	
						60	-340	1750	190	-320	-425	-443.67	-426.5	-436	-439.5	-360.9	-415.4	-10	-358	-230	3	12	
							-400	1690	130	-380	-485	-503.67	-486.5	-496	-499.5	-420.9	-475.4	-70	-418	-290	2	12	
								2090	530	20	-85	-103.67	-86.5	-96	-99.5	-20.9	-75.4	330	-18	110	5	8	
									-1560	-2070	-2175	-2193.67	-2176.5	-2186	-2189.5	-2110.9	-2165.4	-1760	-2108	-1980	0	12	
										-510	-615	-633.67	-616.5	-626	-629.5	-550.9	-605.4	-200	-548	-420	0	11	
											-105	-123.67	-106.5	-116	-119.5	-40.9	-95.4	310	-38	90	2	8	
												-18.67	-1.5	-11	-14.5	64.1	9.6	415	67	195	5	4	
													17.17	7.67	4.17	82.77	28.27	433.67	85.67	213.67	8	0	
														-9.5	-13	65.6	11.1	416.5	68.5	196.5	5	2	
															-3.5	75.1	20.6	426	78	206	5	1	
																78.6	24.1	429.5	81.5	209.5	5	0	
																	-54.5	350.9	2.9	130.9	3	1	
																		405.4	57.4	185.4	3	0	
																			57.4	-220	1	1	
																				128	1	0	
																					64	88	-24

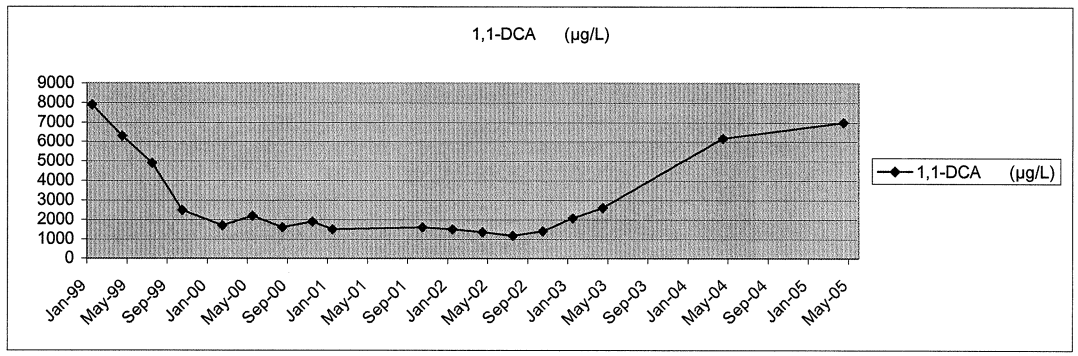
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 24
p = 0.23
α = 0.05
No statistically significant overall 1,1-DCA concentration trend is indicated on the p value (p>a).
Conclusion: No trend is present.



Monitoring Well C-4A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	7900	6300	4900	2500	1700	2200	1600	1900	1500	1600	1500	1360	1170	1400	2090	2620	6170	7000			
		-1600	-3000	-5400	-6200	-5700	-6300	-6000	-6400	-6300	-6400	-6540	-6730	-6500	-5810	-5280	-1730	-900	0	17	
			-1400	-3800	-4600	-4100	-4700	-4400	-4800	-4700	-4800	-4940	-5130	-4900	-4210	-3680	-130	700	1	15	
				-2400	-3200	-2700	-3300	-3000	-3400	-3300	-3400	-3540	-3730	-3500	-2810	-2280	1270	2100	2	13	
					-800	-300	-900	-600	-1000	-900	-1000	-1140	-1330	-1100	-410	120	3670	4500	3	11	
						500	-100	200	-200	-100	-200	-340	-530	-300	390	920	4470	5300	6	7	
							-600	-300	-700	-600	-700	-840	-1030	-800	-110	420	3970	4800	3	9	
								300	-100	0	-100	-240	-430	-200	490	1020	4570	5400	5	5	
									-400	-300	-400	-540	-730	-500	190	720	4270	5100	4	6	
										100	0	-140	-330	-100	590	1120	4670	5500	5	3	
											-100	-240	-430	-200	490	1020	4570	5400	4	4	
												-140	-330	-100	590	1120	4670	5500	4	3	
													-190	40	730	1260	4810	5640	5	1	
														230	920	1450	5000	5830	5	0	
															690	1220	4770	5600	4	0	
																530	4080	4910	3	0	
																	3550	4380	2	0	
																		830	1	0	
																			57	94	-37

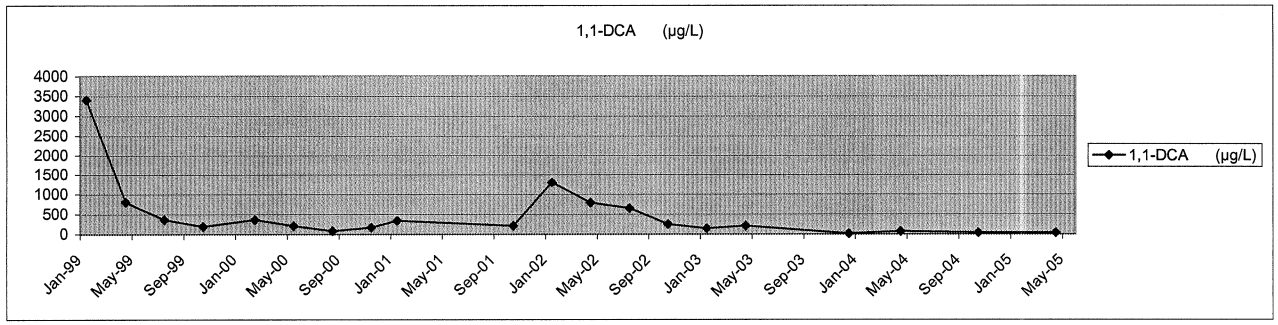
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 37
p = 0.034
α = 0.1
A statistically significant decreasing 1,1-DCA concentration trend is indicated, based on the p value (p<α) and (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-5A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	3400	810	360	190	360	210	78	170	340	210	1300	790	657	250	147	208	19.5	74.3	37.5	41			
		-2590	-3040	-3210	-3040	-3190	-3322	-3230	-3060	-3190	-2100	-2610	-2743	-3150	-3253	-3192	-3380.5	-3325.7	-3362.5	-3359	0	19	
			-450	-620	-450	-600	-732	-640	-470	-600	490	-20	-153	-560	-663	-602	-790.5	-735.7	-772.5	-769	1	17	
				-170	0	-150	-282	-190	-20	-150	940	430	297	-110	-213	-152	-340.5	-285.7	-322.5	-319	3	13	
					170	20	-112	-20	150	20	1110	600	467	60	-43	18	-170.5	-115.7	-152.5	-149	9	7	
						-150	-282	-190	-20	-150	940	430	297	-110	-213	-152	-340.5	-285.7	-322.5	-319	3	12	
							-132	-40	130	0	1090	580	447	40	-63	-2	-190.5	-135.7	-172.5	-169	5	8	
								92	262	132	1222	712	579	172	69	130	-58.5	-3.7	-40.5	-37	9	4	
									170	40	1130	620	487	80	-23	38	-150.5	-95.7	-132.5	-129	7	5	
										-130	960	450	317	-90	-193	-132	-320.5	-265.7	-302.5	-299	3	8	
											1090	580	447	40	-63	-2	-190.5	-135.7	-172.5	-169	4	6	
												-510	-643	-1050	-1153	-1092	-1280.5	-1225.7	-1262.5	-1259	0	9	
													-133	-540	-643	-582	-770.5	-715.7	-752.5	-749	0	8	
														-407	-510	-449	-637.5	-582.7	-619.5	-616	0	7	
															-103	-42	-230.5	-175.7	-212.5	-209	0	6	
																61	-127.5	-72.7	-109.5	-106	1	4	
																	-188.5	-133.7	-170.5	-167	0	4	
																		54.8	18	21.5	3	0	
																			-36.8	-33.3	0	2	
																				3.5	1	0	
																					48	103	-55

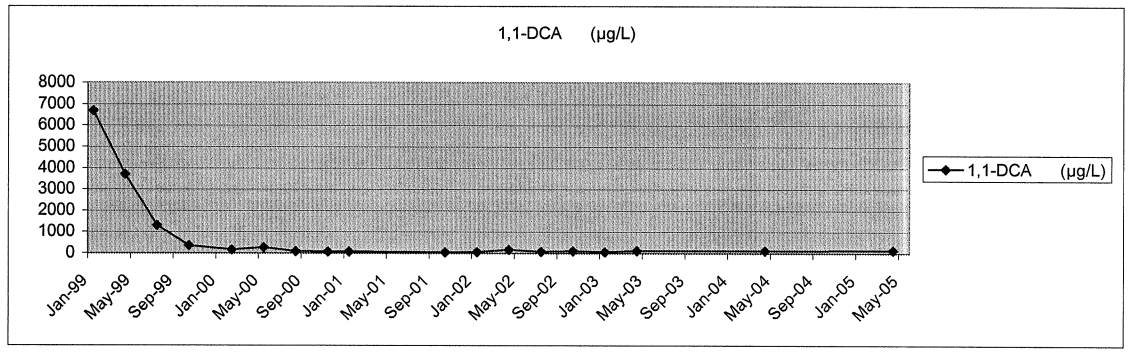
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 55
p = 0.04
α = 0.05
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value (p<α) and (-) sign of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-5B

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	6700	3700	1300	360	160	270	93	74	80	49	57	159	80.9	110	54.6	126	116	130			
		-3000	-5400	-6340	-6540	-6430	-6607	-6626	-6620	-6651	-6643	-6541	-6619.1	-6590	-6645.4	-6574	-6584	-6570	0	17	
			-2400	-3340	-3540	-3430	-3607	-3626	-3620	-3651	-3643	-3541	-3619.1	-3590	-3645.4	-3574	-3584	-3570	0	16	
				-940	-1140	-1030	-1207	-1226	-1220	-1251	-1243	-1141	-1219.1	-1190	-1245.4	-1174	-1184	-1170	0	15	
					-200	-90	-267	-286	-280	-311	-303	-201	-279.1	-250	-305.4	-234	-244	-230	0	14	
						110	-67	-86	-80	-111	-103	-1	-79.1	-50	-105.4	-34	-44	-30	1	12	
							-177	-196	-190	-221	-213	-111	-189.1	-160	-215.4	-144	-154	-140	0	12	
								-19	-13	-44	-36	66	-12.1	17	-38.4	33	23	37	5	6	
									6	-25	-17	85	6.9	36	-19.4	52	42	56	7	3	
										-31	-23	79	0.9	30	-25.4	46	36	50	6	3	
											8	110	31.9	61	5.6	77	67	81	8	0	
												102	23.9	53	-2.4	69	59	73	6	1	
													-78.1	-49	-104.4	-33	-43	-29	0	6	
														29.1	-26.3	45.1	35.1	49.1	4	1	
															-55.4	16	6	20	3	1	
																71.4	61.4	75.4	3	0	
																	-10	4	1	1	
																		14	1	0	
																			45	108	-63

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 63
p = 0.0040
α = 0.05
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value ($p<\alpha$) and (-) sign of the S value.
Conclusion: Decreasing trend is present.

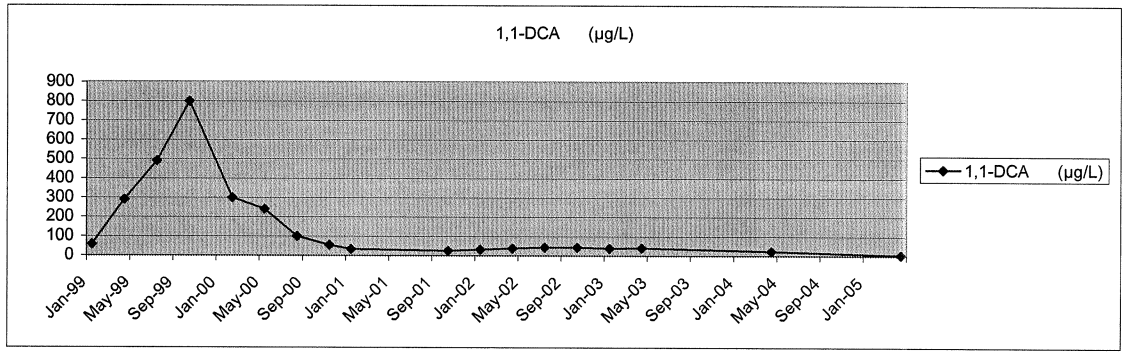


Monitoring Well C-5C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	58	290	490	800	300	240	100	55	34	25	32	38.1	42.7	43	37.6	39.3	23.9	2.8			
		232	432	742	242	182	42	-3	-24	-33	-26	-19.9	-15.3	-15	-20.4	-18.7	-34.1	-55.2	6	11	
			200	510	10	-50	-190	-235	-256	-265	-258	-251.9	-247.3	-247	-252.4	-250.7	-266.1	-287.2	3	13	
				310	-190	-250	-390	-435	-456	-465	-458	-451.9	-447.3	-447	-452.4	-450.7	-466.1	-487.2	1	14	
					-500	-560	-700	-745	-766	-775	-768	-761.9	-757.3	-757	-762.4	-760.7	-776.1	-797.2	0	14	
						-60	-200	-245	-266	-275	-268	-261.9	-257.3	-257	-262.4	-260.7	-276.1	-297.2	0	13	
							-140	-185	-206	-215	-208	-201.9	-197.3	-197	-202.4	-200.7	-216.1	-237.2	0	12	
								-45	-66	-75	-68	-61.9	-57.3	-57	-62.4	-60.7	-76.1	-97.2	0	11	
									-21	-30	-23	-16.9	-12.3	-12	-17.4	-15.7	-31.1	-52.2	0	10	
										-9	-2	4.1	8.7	9	3.6	5.3	-10.1	-31.2	5	4	
											7	13.1	17.7	18	12.6	14.3	-1.1	-22.2	6	2	
												6.1	10.7	11	5.6	7.3	-8.1	-29.2	5	2	
													4.6	4.9	-0.5	1.2	-14.2	-35.3	3	3	
														0.3	-5.1	-3.4	-18.8	-39.9	1	4	
															-5.4	-3.7	-19.1	-40.2	0	4	
																1.7	-13.7	-34.8	1	2	
																	-15.4	-36.5	0	2	
																		-21.1	0	1	
																			31	122	-91

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 91
p < 0.0005
α = 0.05

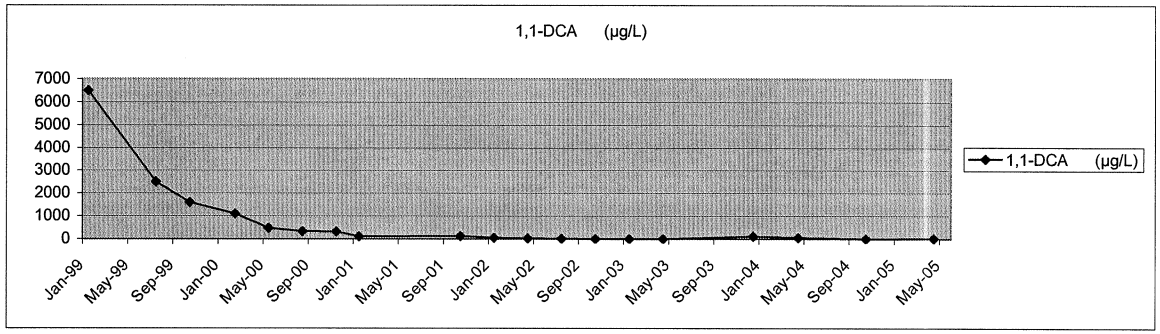
A statistically significant decreasing 1,1-DCA concentration trend is indicated (p<α) overall. Also, a statistically significant increasing trend is indicated (p<α) from Jan 1999 through Oct 1999 (p=0.042; S=6; n=4), and a statistically significant decreasing trend is indicated from Oct 1999 through Jan 2003 (p=0.007; S=-39; n=12) (p values based on 1-tail analyses).
Conclusion: Decreasing overall trend is present, and trends exist within the data set.



Monitoring Well C-7A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	6500	2500	1600	1100	470	340	320	110	130	60	25.1	11.6	5.9	3.79	2.82	107	56.2	6.01	8.3			
		-4000	-4900	-5400	-6030	-6160	-6180	-6390	-6370	-6440	-6474.9	-6488.4	-6494.1	-6496.21	-6497.18	-6393	-6443.8	-6493.99	-6491.7	0	18	
			-900	-1400	-2030	-2160	-2180	-2390	-2370	-2440	-2474.9	-2488.4	-2494.1	-2496.21	-2497.18	-2393	-2443.8	-2493.99	-2491.7	0	17	
				-500	-1130	-1260	-1280	-1490	-1470	-1540	-1574.9	-1588.4	-1594.1	-1596.21	-1597.18	-1493	-1543.8	-1593.99	-1591.7	0	16	
					-630	-760	-780	-990	-970	-1040	-1074.9	-1088.4	-1094.1	-1096.21	-1097.18	-993	-1043.8	-1093.99	-1091.7	0	15	
						-130	-150	-360	-340	-410	-444.9	-458.4	-464.1	-466.21	-467.18	-363	-413.8	-463.99	-461.7	0	14	
							-20	-230	-210	-280	-314.9	-328.4	-334.1	-336.21	-337.18	-233	-283.8	-333.99	-331.7	0	13	
								-210	-190	-260	-294.9	-308.4	-314.1	-316.21	-317.18	-213	-263.8	-313.99	-311.7	0	12	
									20	-50	-84.9	-98.4	-104.1	-106.21	-107.18	-3	-53.8	-103.99	-101.7	1	10	
										-70	-104.9	-118.4	-124.1	-126.21	-127.18	-23	-73.8	-123.99	-121.7	0	10	
											-34.9	-48.4	-54.1	-56.21	-57.18	47	-3.8	-53.99	-51.7	1	8	
												-13.5	-19.2	-21.31	-22.28	81.9	31.1	-19.09	-16.8	2	6	
													-5.7	-7.81	-8.78	95.4	44.6	-5.59	-3.3	2	5	
														-2.11	-3.08	101.1	50.3	0.11	2.4	4	2	
															-0.97	103.21	52.41	2.22	4.51	4	1	
																104.18	53.38	3.19	5.48	4	0	
																	-50.8	-100.99	-98.7	0	3	
																		-50.19	-47.9	0	2	
																			2.29	1	0	
																				19	101	-82

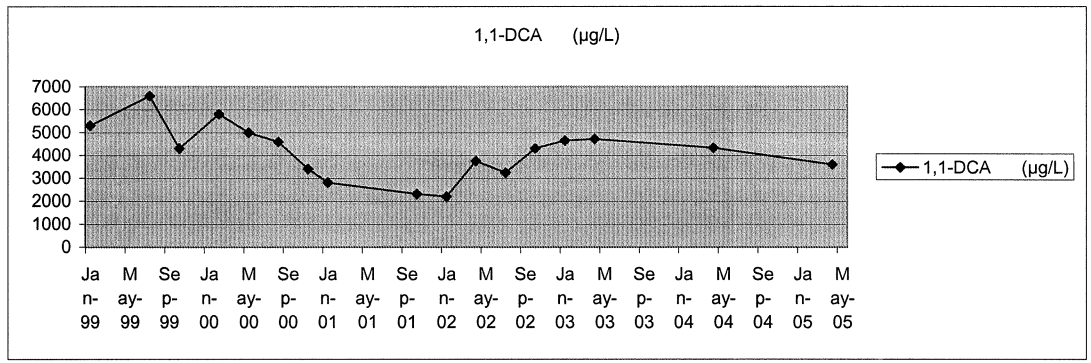
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 19
|S|= 82
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value ($p<\alpha$) and (-) sign of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-8A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	5300	6600	4300	5800	5000	4600	3400	2800	2300	2200	3750	3230	4300	4650	4720	4330	3600			
		1300	-1000	500	-300	-700	-1900	-2500	-3000	-3100	-1550	-2070	-1000	-650	-580	-970	-1700	2	14	
			-2300	-800	-1600	-2000	-3200	-3800	-4300	-4400	-2850	-3370	-2300	-1950	-1880	-2270	-3000	0	15	
				1500	700	300	-900	-1500	-2000	-2100	-550	-1070	0	350	420	30	-700	6	7	
					-800	-1200	-2400	-3000	-3500	-3600	-2050	-2570	-1500	-1150	-1080	-1470	-2200	0	13	
						-400	-1600	-2200	-2700	-2800	-1250	-1770	-700	-350	-280	-670	-1400	0	12	
							-1200	-1800	-2300	-2400	-850	-1370	-300	50	120	-270	-1000	2	9	
								-600	-1100	-1200	350	-170	900	1250	1320	930	200	6	4	
									-500	-600	950	430	1500	1850	1920	1530	800	7	2	
										-100	1450	930	2000	2350	2420	2030	1300	7	1	
											1550	1030	2100	2450	2520	2130	1400	7	0	
												-520	550	900	970	580	-150	4	2	
													1070	1420	1490	1100	370	5	0	
														350	420	30	-700	3	1	
															70	-320	-1050	1	2	
																-390	-1120	0	2	
																	-730	0	1	
																		50	85	-35

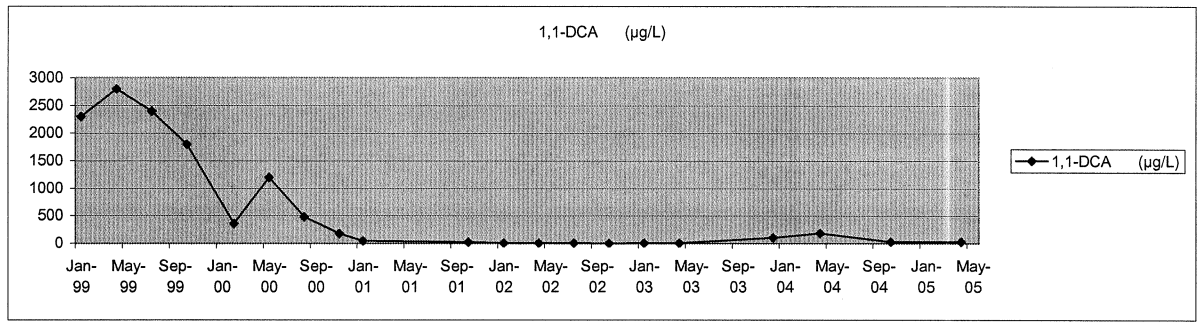
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 35
p = 0.211
α = 0.1
No statistically significant overall 1,1-DCA concentration trend is indicated based on the p value (p>a).



Monitoring Well C-9A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	2300	2800	2400	1800	360	1200	480	180	47	25	6.4	2.98	2.91	2.6	3.17	7.31	104	187	29.5	30			
		500	100	-500	-1940	-1100	-1820	-2120	-2253	-2275	-2293.6	-2297.02	-2297.09	-2297.4	-2296.83	-2292.69	-2196	-2113	-2270.5	-2270	2	17	
			-400	-1000	-2440	-1600	-2320	-2620	-2753	-2775	-2793.6	-2797.02	-2797.09	-2797.4	-2796.83	-2792.69	-2696	-2613	-2770.5	-2770	0	18	
				-600	-2040	-1200	-1920	-2220	-2353	-2375	-2393.6	-2397.02	-2397.09	-2397.4	-2396.83	-2392.69	-2296	-2213	-2370.5	-2370	0	17	
					-1440	-600	-1320	-1620	-1753	-1775	-1793.6	-1797.02	-1797.09	-1797.4	-1796.83	-1792.69	-1696	-1613	-1770.5	-1770	0	16	
						840	120	-180	-313	-335	-353.6	-357.02	-357.09	-357.4	-356.83	-352.69	-256	-173	-330.5	-330	2	13	
							-720	-1020	-1153	-1175	-1193.6	-1197.02	-1197.09	-1197.4	-1196.83	-1192.69	-1096	-1013	-1170.5	-1170	0	14	
								-300	-433	-455	-473.6	-477.02	-477.09	-477.4	-476.83	-472.69	-376	-293	-450.5	-450	0	13	
									-133	-155	-173.6	-177.02	-177.09	-177.4	-176.83	-172.69	-76	7	-150.5	-150	1	11	
										-22	-40.6	-44.02	-44.09	-44.4	-43.83	-39.69	57	140	-17.5	-17	2	9	
											-18.6	-22.02	-22.09	-22.4	-21.83	-17.69	79	162	4.5	5	4	6	
												-3.42	-3.49	-3.80	-3.23	0.91	97.60	180.60	23.10	23.60	5	4	
													-0.07	-0.38	0.19	4.33	101.02	184.02	26.52	27.02	6	2	
														-0.31	0.26	4.4	101.09	184.09	26.59	27.09	6	1	
															0.57	4.71	101.4	184.4	26.9	27.4	6	0	
																4.14	100.83	183.83	26.33	26.83	5	0	
																	96.69	179.69	22.19	22.69	4	0	
																		83	-74.5	-74	1	2	
																			-157.5	-157	0	2	
																				0.5	1	0	
																					43	93	-50

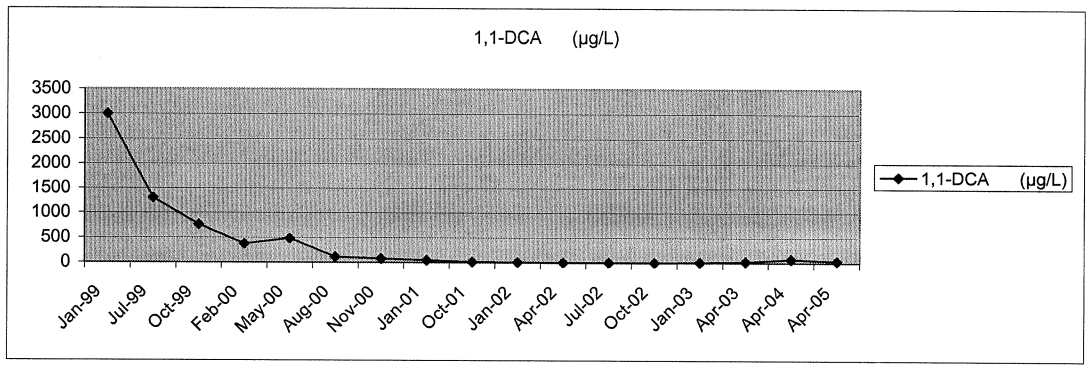
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 50
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value (p<α) and (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-9B

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	3000	1300	760	370	480	110	75	44	14	3.4	2.19	2.82	3.1	3.84	19	68.1	29			
		-1700	-2240	-2630	-2520	-2890	-2925	-2956	-2986	-2996.6	-2997.81	-2997.18	-2996.9	-2996.16	-2981	-2931.9	-2971	0	16	
			-540	-930	-820	-1190	-1225	-1256	-1286	-1296.6	-1297.81	-1297.18	-1296.9	-1296.16	-1281	-1231.9	-1271	0	15	
				-390	-280	-650	-685	-716	-746	-756.6	-757.81	-757.18	-756.9	-756.16	-741	-691.9	-731	0	14	
					110	-260	-295	-326	-356	-366.6	-367.81	-367.18	-366.9	-366.16	-351	-301.9	-341	1	12	
						-370	-405	-436	-466	-476.6	-477.81	-477.18	-476.9	-476.16	-461	-411.9	-451	0	12	
							-35	-66	-96	-106.6	-107.81	-107.18	-106.9	-106.16	-91	-41.9	-81	0	11	
								-31	-61	-71.6	-72.81	-72.18	-71.9	-71.16	-56	-6.9	-46	0	10	
									-30	-40.6	-41.81	-41.18	-40.9	-40.16	-25	24.1	-15	1	8	
										-10.6	-11.81	-11.18	-10.9	-10.16	5	54.1	15	3	5	
											-1.21	-0.58	-0.3	0.44	15.6	64.7	25.6	4	3	
												0.63	0.91	1.65	16.81	65.91	26.81	6	0	
													0.28	1.02	16.18	65.28	26.18	5	0	
														0.74	15.9	65	25.9	4	0	
															15.16	64.26	25.16	3	0	
																49.1	10	2	0	
																	-39.1	0	1	
																		29	107	-78

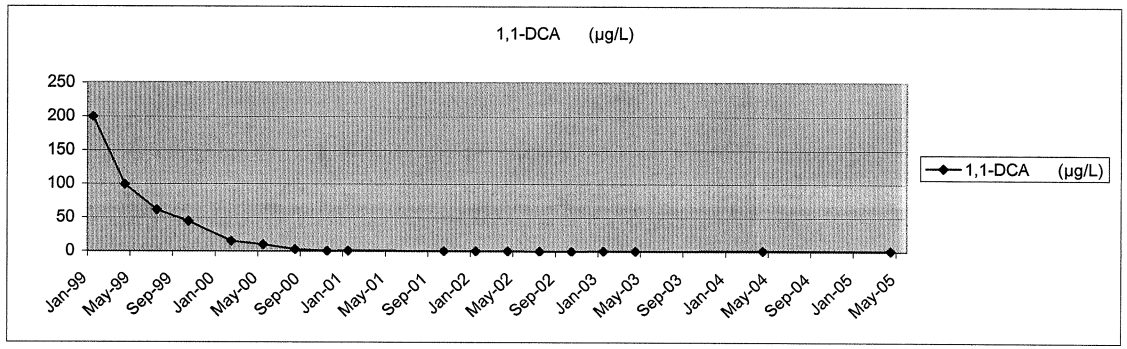
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 16
|S|= 78
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value (p<α) and (-) of the S value.
Conclusion: Decreasing trend is present



Monitoring Well C-9C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	200	99	61	44	15	10	3	0.66	0.9	0.69	0.29	0.257	0.199	0.21	0.319	0.425	0.745	*1*			
		-101	-139	-156	-185	-190	-197	-199.34	-199.1	-199.31	-199.71	-199.743	-199.801	-199.79	-199.681	-199.575	-199.255	-199	0	17	
			-38	-55	-84	-89	-96	-98.34	-98.1	-98.31	-98.71	-98.743	-98.801	-98.79	-98.681	-98.575	-98.255	-98	0	16	
				-17	-46	-51	-58	-60.34	-60.1	-60.31	-60.71	-60.743	-60.801	-60.79	-60.681	-60.575	-60.255	-60	0	15	
					-29	-34	-41	-43.34	-43.1	-43.31	-43.71	-43.743	-43.801	-43.79	-43.681	-43.575	-43.255	-43	0	14	
						-5	-12	-14.34	-14.1	-14.31	-14.71	-14.743	-14.801	-14.79	-14.681	-14.575	-14.255	-14	0	13	
							-7	-9.34	-9.1	-9.31	-9.71	-9.743	-9.801	-9.79	-9.681	-9.575	-9.255	-9	0	12	
								-2.34	-2.1	-2.31	-2.71	-2.743	-2.801	-2.79	-2.681	-2.575	-2.255	-2	0	11	
									0.24	0.03	-0.37	-0.403	-0.461	-0.45	-0.341	-0.235	0.085	0.34	4	6	
										-0.21	-0.61	-0.643	-0.701	-0.69	-0.581	-0.475	-0.155	0.1	1	8	
											-0.4	-0.433	-0.491	-0.48	-0.371	-0.265	0.055	0.31	2	6	
												-0.033	-0.091	-0.08	0.029	0.135	0.455	0.71	4	3	
													-0.058	-0.047	0.062	0.168	0.488	0.743	4	2	
														0.011	0.12	0.226	0.546	0.801	5	0	
															0.109	0.215	0.535	0.79	4	0	
																0.106	0.426	0.681	3	0	
																	0.32	0.575	2	0	
																		0.255	1	0	
																			30	123	-93

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 93
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value (p<α) and (-) of the S value.
Conclusion: Decreasing trend is present.



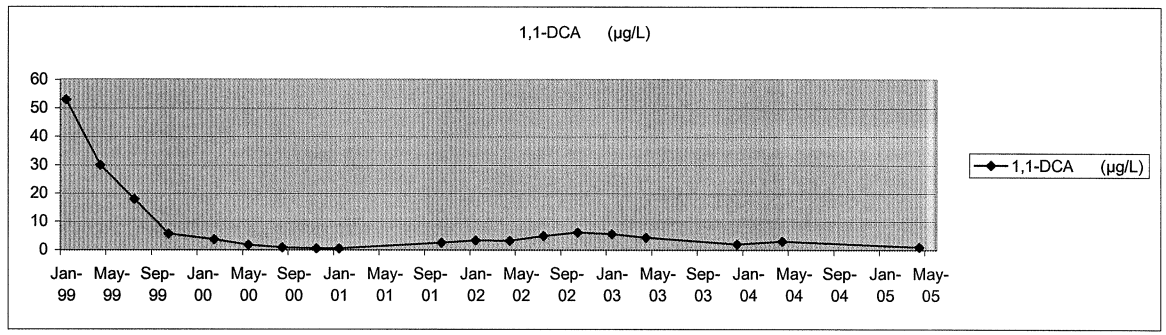
Monitoring Well C-10

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	53	30	18	5.7	3.7	1.8	0.92	0.52	0.53	2.6	3.4	3.24	4.95	6.2	5.63	4.37	2.07	3.02	*1*			
		-23	-35	-47.3	-49.3	-51.2	-52.08	-52.48	-52.47	-50.4	-49.6	-49.76	-48.05	-46.8	-47.37	-48.63	-50.93	-49.98	-52	0	18	
			-12	-24.3	-26.3	-28.2	-29.08	-29.48	-29.47	-27.4	-26.6	-26.76	-25.05	-23.8	-24.37	-25.63	-27.93	-26.98	-29	0	17	
				-12.3	-14.3	-16.2	-17.08	-17.48	-17.47	-15.4	-14.6	-14.76	-13.05	-11.8	-12.37	-13.63	-15.93	-14.98	-17	0	16	
					-2	-3.9	-4.78	-5.18	-5.17	-3.1	-2.3	-2.46	-0.75	0.5	-0.07	-1.33	-3.63	-2.68	-4.7	1	14	
						-1.9	-2.78	-3.18	-3.17	-1.1	-0.3	-0.46	1.25	2.5	1.93	0.67	-1.63	-0.68	-2.7	4	10	
							-0.88	-1.28	-1.27	0.8	1.6	1.44	3.15	4.4	3.83	2.57	0.27	1.22	-0.8	9	4	
								-0.4	-0.39	1.68	2.48	2.32	4.03	5.28	4.71	3.45	1.15	2.1	0.08	10	2	
									0.01	2.08	2.88	2.72	4.43	5.68	5.11	3.85	1.55	2.5	0.48	11	0	
										2.07	2.87	2.71	4.42	5.67	5.1	3.84	1.54	2.49	0.47	10	0	
											0.8	0.64	2.35	3.6	3.03	1.77	-0.53	0.42	-1.6	7	2	
												-0.16	1.55	2.8	2.23	0.97	-1.33	-0.38	-2.4	4	4	
													1.71	2.96	2.39	1.13	-1.17	-0.22	-2.24	4	3	
														1.25	0.68	-0.58	-2.88	-1.93	-3.95	2	4	
															-0.57	-1.83	-4.13	-3.18	-5.2	0	5	
																-1.26	-3.56	-2.61	-4.63	0	4	
																	-2.3	-1.35	-3.37	0	3	
																		0.95	-1.07	1	1	
																			-2.02	0	1	
																				63	108	-45

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 18
|S|= 45
p = 0.230
α = 0.1

No statistically significant overall 1,1-DCA concentration trend is indicated based on the p value ($p>\alpha$). However, concentrations since October 1999 are greater than those of samples collected subsequently. Also, a statistically significant decreasing concentration is noted from January 1999 through November 2000 (p=2.5E-5; S=-28; n=8) and statistically significant trend is observed since that time (p=0.00174; S=-24; n=8).

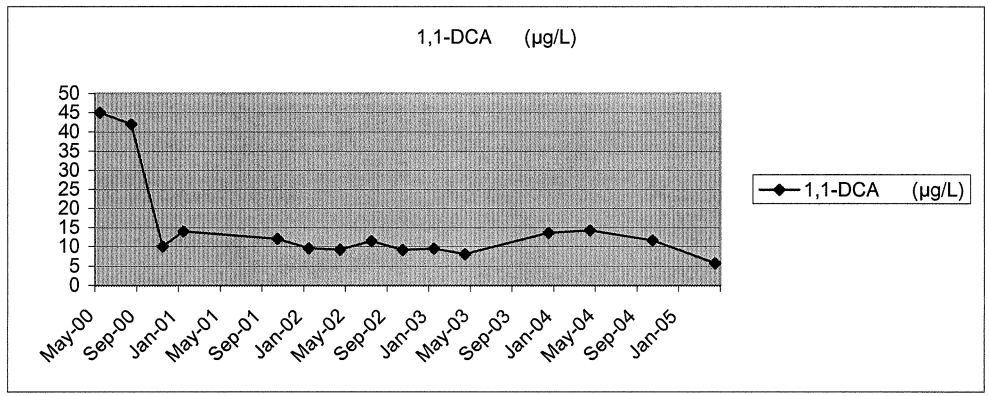
Conclusion: No overall trend is present, but significant trends exist within subsets of the data.



Monitoring Well C-11

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	45	42	10	14	12	9.5	9.15	11.4	9.1	9.47	8.04	13.6	14.2	11.6	5.7			
		-3	-35	-31	-33	-35.5	-35.85	-33.6	-35.9	-35.53	-36.96	-31.4	-30.8	-33.4	-39.3	0	14	
			-32	-28	-30	-32.5	-32.85	-30.6	-32.9	-32.53	-33.96	-28.4	-27.8	-30.4	-36.3	0	13	
				4	2	-0.5	-0.85	1.4	-0.9	-0.53	-1.96	3.6	-27.8	-30.4	-4.3	4	8	
					-2	-4.5	-4.85	-2.6	-4.9	-4.53	-5.96	-0.4	0.2	-2.4	-8.3	1	10	
						-2.5	-2.85	-0.6	-2.9	-2.53	-3.96	1.6	2.2	-0.4	-6.3	2	8	
							-0.35	1.9	-0.4	-0.03	-1.46	4.1	4.7	2.1	-3.8	4	5	
								2.25	-0.05	0.32	-1.11	4.45	5.05	2.45	-3.45	5	3	
									-2.3	-1.93	-3.36	2.2	2.8	0.2	-5.7	3	4	
										0.37	-1.06	4.5	5.1	2.5	-3.4	4	2	
											-1.43	4.13	4.73	2.13	-3.77	3	2	
												5.56	6.16	3.56	-2.34	3	1	
													0.6	-2	-7.9	1	2	
														-2.6	-8.5	0	2	
															-5.9	0	1	
																30	48	-18

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 18
p = <0.0005
α = 0.05
A statistically significant decreasing 1,1-DCA concentration trend is indicated (p<α). Conclusion: A decreasing trend is present.

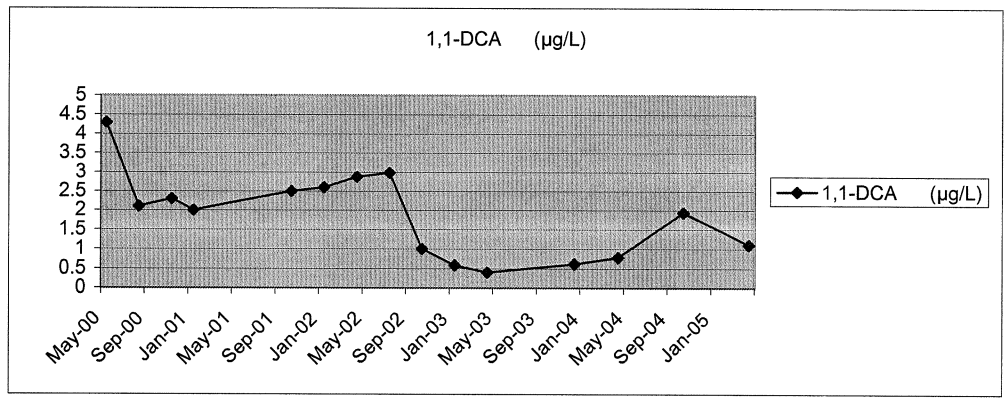


Monitoring Well C-12

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	4.3	2.1	2.3	2	2.5	2.6	2.87	2.98	1	0.578	0.398	0.616	0.775	1.94	1.1			
		-2.2	-2	-2.3	-1.8	-1.7	-1.43	-1.32	-3.3	-3.722	-3.902	-3.684	-3.525	-2.36	-3.2	0	14	
			0.2	-0.1	0.4	0.5	0.77	0.88	-1.1	-1.522	-1.702	-1.484	-1.325	-0.16	-1	5	8	
				-0.3	0.2	0.3	0.57	0.68	-1.3	-1.722	-1.902	-1.684	-1.525	-0.36	-1.2	4	8	
					0.5	0.6	0.87	0.98	-1	-1.422	-1.602	-1.384	-1.225	-0.06	-0.9	4	7	
						0.1	0.37	0.48	-1.5	-1.922	-2.102	-1.884	-1.725	-0.56	-1.4	3	7	
							0.27	0.38	-1.6	-2.022	-2.202	-1.984	-1.825	-0.66	-1.5	2	7	
								0.11	-1.87	-2.292	-2.472	-2.254	-2.095	-0.93	-1.77	1	7	
									-1.98	-2.402	-2.582	-2.364	-2.205	-1.04	-1.88	0	7	
										-0.422	-0.602	-0.384	-0.225	0.94	0.1	2	4	
											-0.18	0.038	0.197	1.362	0.522	4	1	
												0.218	0.377	1.542	0.702	4	0	
													0.159	1.324	0.484	3	0	
														1.165	0.325	2	0	
															-0.84	0	1	
																29	49	-20

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 20
p = < 0.0005
α = 0.05

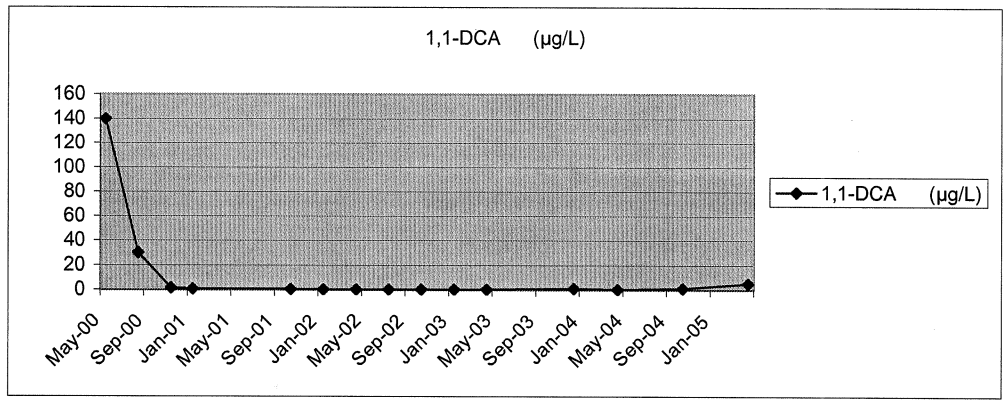
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value ($p<\alpha$) and (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-13

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	140	30	1.6	0.85	0.65	0.29	0.17	0.242	0.28	0.23	0.257	*1*	0.168	*1*	*5*			
		-110	-138.4	-139.15	-139.35	-139.71	-139.83	-139.758	-139.72	-139.77	-139.743	-139	-139.832	-139	-135	0	14	
			-28.4	-29.15	-29.35	-29.71	-29.83	-29.758	-29.72	-29.77	-29.743	-29	-29.832	-29	-25	0	13	
				-0.75	-0.95	-1.31	-1.43	-1.358	-1.32	-1.37	-1.343	-0.6	-1.432	-0.6	3.4	1	11	
					-0.2	-0.56	-0.68	-0.608	-0.57	-0.62	-0.593	0.15	-0.682	0.15	4.15	3	8	
						-0.36	-0.48	-0.408	-0.37	-0.42	-0.393	0.35	-0.482	0.35	4.35	3	7	
							-0.12	-0.048	-0.01	-0.06	-0.033	0.71	-0.122	0.71	4.71	3	6	
								0.072	0.11	0.06	0.087	0.83	-0.002	0.83	4.83	7	1	
									0.038	-0.012	0.015	0.758	-0.074	0.758	4.758	5	2	
										-0.05	-0.023	0.72	-0.112	0.72	4.72	3	3	
											0.027	0.77	-0.062	0.77	4.77	4	1	
												0.743	-0.089	0.743	4.743	3	1	
													-0.832	0	4	1	1	
														0.832	4.832	2	0	
															4	1	0	
																36	41	-5

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 5
p = 0.197
α = 0.05
No statistically significant overall 1,1-DCA concentration trend is indicated based on the p value ($p>\alpha$).
Conclusion: No trend is present.

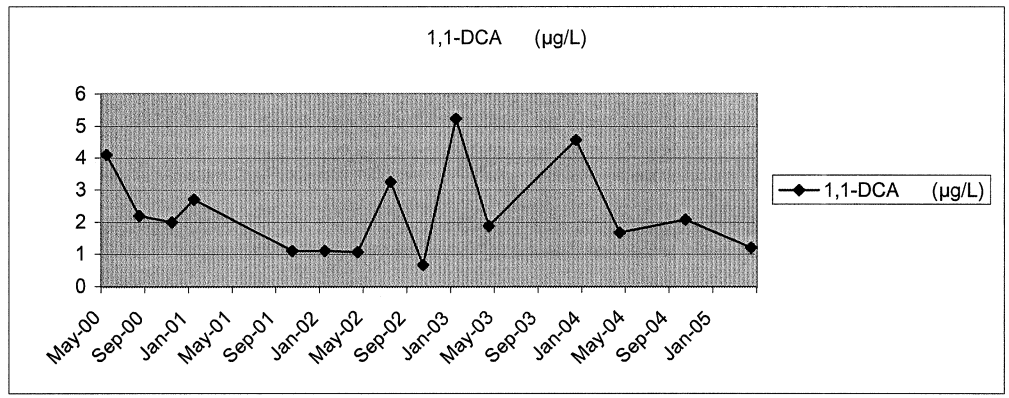


Monitoring Well C-14

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	4.1	2.2	2	2.7	1.1	1.1	1.06	3.25	0.67	5.24	1.88	4.57	1.67	2.08	1.2			
		-1.9	-2.1	-1.4	-3	-3	-3.04	-0.85	-3.43	1.14	-2.22	0.47	-2.43	-2.02	-2.9	2	12	
			-0.2	0.5	-1.1	-1.1	-1.14	1.05	-1.53	3.04	-0.32	2.37	-0.53	-0.12	-1	4	9	
				0.7	-0.9	-0.9	-0.94	1.25	-1.33	3.24	-0.12	2.57	-0.33	0.08	-0.8	5	7	
					-1.6	-1.6	-1.64	0.55	-2.03	2.54	-0.82	1.87	-1.03	-0.62	-1.5	3	8	
						0	-0.04	2.15	-0.43	4.14	0.78	3.47	0.57	0.98	0.1	7	2	
							-0.04	2.15	-0.43	4.14	0.78	3.47	0.57	0.98	0.1	7	2	
								2.19	-0.39	4.18	0.82	3.51	0.61	1.02	0.14	7	1	
									-2.58	1.99	-1.37	1.32	-1.58	-1.17	-2.05	2	5	
										4.57	1.21	3.9	1	1.41	0.53	6	0	
											-3.36	-0.67	-3.57	-3.16	-4.04	0	5	
												2.69	-0.21	0.2	-0.68	2	2	
													-2.9	-2.49	-3.37	0	3	
														0.41	-0.47	1	1	
															-0.88	0	1	
																40	37	3

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 3
p = 0.557
α = 0.05

No statistically significant overall 1,1-DCA concentration trend is indicated based on the p value (p>a).

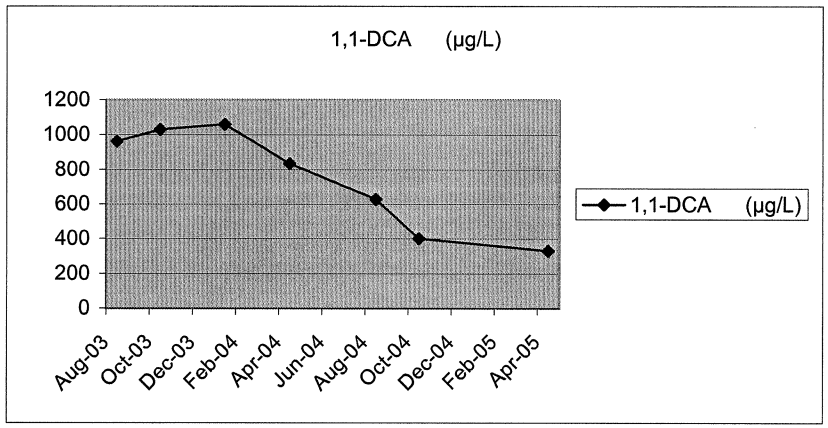


Monitoring Well C-15

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCA (µg/L)	962	1030	1060	835	628	400	330							
		68	98	-127	-334	-562	-632					2	4	
			30	-195	-402	-630	-700					1	4	
				-225	-432	-660	-730					0	4	
					-207	-435	-505					0	3	
						-228	-298					0	2	
							-70					0	1	
												3	18	-15

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 15
p = < 0.0005
α = 0.05

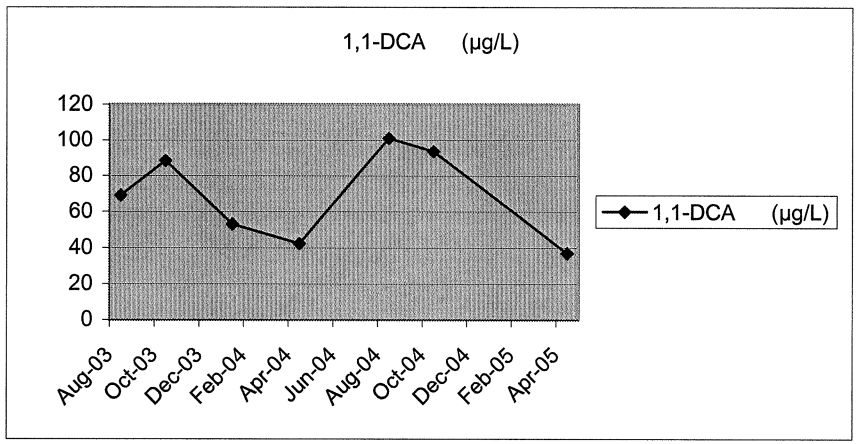
A statistically significant decreasing 1,1-DCA concentration trend is indicated by the p level ($p<\alpha$) and sign (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-16

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCA (µg/L)	69.1	88.4	53	42.4	101	93.5	37							
		19.3	-16.1	-26.7	31.9	24.4	-32.1					3	3	
			-35.4	-46	12.6	5.1	-51.4					2	3	
				-10.6	48	40.5	-16					2	2	
					58.6	51.1	-5.4					2	1	
						-7.5	-64					0	2	
							-56.5					0	1	
												9	12	-3

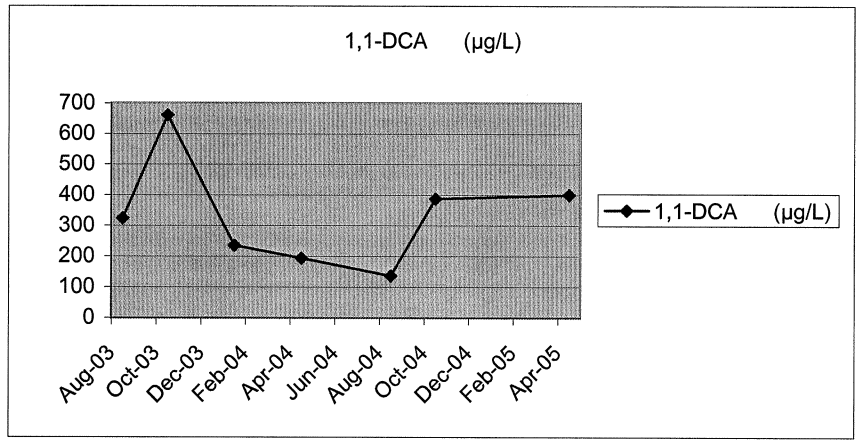
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 3
p = 0.297
α = 0.05
No statistically significant overall 1,1-DCA concentration trend is indicated based on the p level ($p>\alpha$).
Conclusion: A decreasing trend is illustrated graphically.



Monitoring Well C-17

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCA (µg/L)	324	661	235	194	136	388	400							
		337	-89	-130	-188	64	76					3	3	
			-426	-467	-525	-273	-261					0	5	
				-41	-99	153	165					2	2	
					-58	194	206					2	1	
						252	264					2	0	
							12					1	0	
												10	11	-1

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 1
p = 0.228
α = 0.05
No statistically significant overall 1,1-DCA concentration trend is indicated based on the p level (p>α).
Conclusion: No trend is discernible.

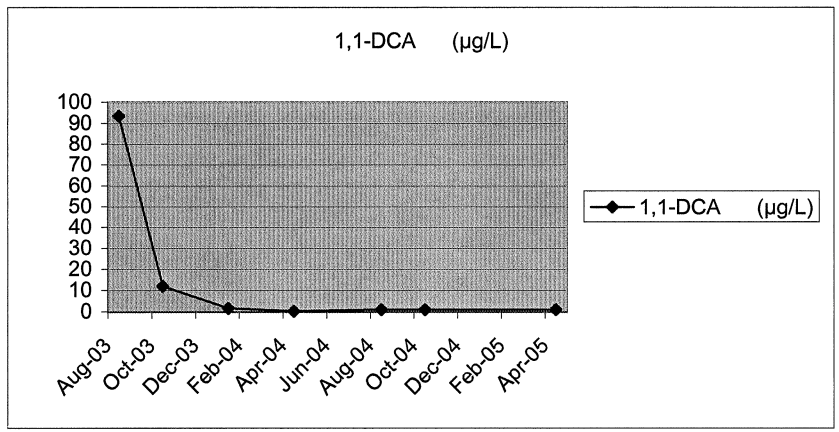


Monitoring Well C-18

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCA (µg/L)	93.5	12	1.67	0.242	*1*	*1*	*1*							
		-81.5	-91.83	-93.258	-92.5	-92.5	-92.5					0	6	
			-10.33	-11.758	-11	-11	-11					0	5	
				-1.428	-0.67	-0.67	-0.67					0	4	
					0.758	0.758	0.758					3	0	
						0	0					0	0	
							0					0	0	
												3	15	-12

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 12
p < 0.0005
α = 0.05

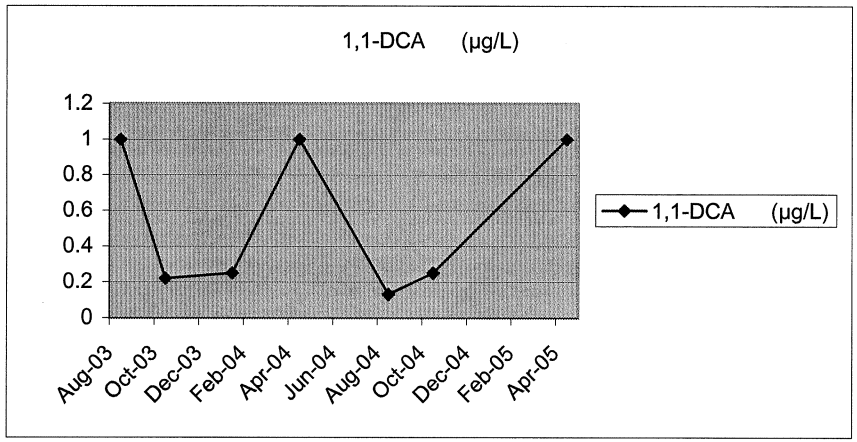
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p level (p<α) and (-) sign of the S value.
Conclusion: A decreasing trend is present.



Monitoring Well C-19

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCA (µg/L)	*1*	0.22	0.25	*1*	0.131	0.25	*1*							
		-0.78	-0.75	0	-0.869	-0.75	0					0	4	
			0.03	0.78	-0.089	0.03	0.78					4	1	
				0.75	-0.119	0	0.75					2	1	
					-0.869	-0.75	0					0	2	
						0.119	0.869					2	0	
							0.75					1	0	
												9	8	1

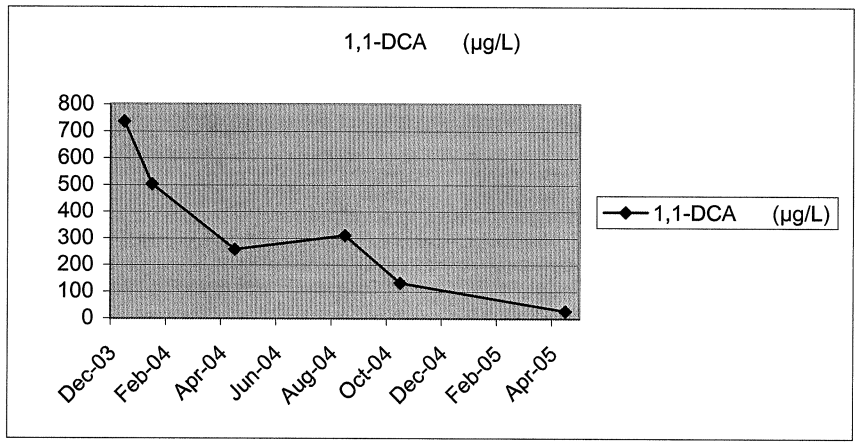
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 1
p = 1
α = 0.05
No statistically significant overall 1,1-DCA concentration trend is indicated based on the p level ($p>\alpha$).
Conclusion: No trend is discrenible.



Monitoring Well C-20

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
1,1-DCA (µg/L)	737	503	258	311	132	27								
		-234	-479	-426	-605	-710						0	5	
			-245	-192	-371	-476						0	4	
				53	-126	-231						1	2	
					-179	-284						0	2	
						-105						0	1	
												1	14	-13

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 6
|S|= 13
p = < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value (p> α) and sign (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-21

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
1,1-DCA (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*								
		0	0	0	0	0						0	0	
			0	0	0	0						0	0	
				0	0	0						0	0	
					0	0						0	0	
						0						0	0	
												0	0	0

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 6
|S|= 0
p = *
α = 0.05

* Six analytes were collected and the all the samples are nondetects; therefore, Mann-Kendall trend analysis is not possible.

Conclusion: No trend is discernible.

Monitoring Well MW-105

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	1	***1***	***1***	***1***	***1***	***1***	1.6	3.9	2.3	2	1.57	0.643	0.91	0.31	***1***	***1***	***0.5***			
		0	0	0	0	0	0.6	2.9	1.3	1	0.57	-0.357	-0.09	-0.69	0	0	-0.5	5	4	
			0	0	0	0	0.6	2.9	1.3	1	0.57	-0.357	-0.09	-0.69	0	0	-0.5	5	4	
				0	0	0	0.6	2.9	1.3	1	0.57	-0.357	-0.09	-0.69	0	0	-0.5	5	4	
					0	0	0.6	2.9	1.3	1	0.57	-0.357	-0.09	-0.69	0	0	-0.5	5	4	
						0	0.6	2.9	1.3	1	0.57	-0.357	-0.09	-0.69	0	0	-0.5	5	4	
							0.6	2.9	1.3	1	0.57	-0.357	-0.09	-0.69	0	0	-0.5	5	4	
								2.3	0.7	0.4	-0.03	-0.957	-0.69	-1.29	-0.6	-0.6	-1.1	3	7	
									-1.6	-1.9	-2.33	-3.257	-2.99	-3.59	-2.9	-2.9	-3.4	0	9	
										-0.3	-0.73	-1.657	-1.39	-1.99	-1.3	-1.3	-1.8	0	8	
											-0.43	-1.357	-1.09	-1.69	-1	-1	-1.5	0	7	
												-0.927	-0.66	-1.26	-0.57	-0.57	-1.07	0	6	
													0.267	-0.333	0.357	0.357	-0.143	3	2	
														-0.6	0.09	0.09	-0.41	2	2	
															0.69	0.69	0.19	3	0	
																0	-0.5	0	1	
																	-0.5	0	1	
																		41	67	-26

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 26
p = 0.626
α = 0.1

No statistically significant overall 1,1-DCA concentration trend is indicated based on the p value (p>α).
Conclusion: No trend is present.

Notes:
1 Denotes detection limit value of a nondetect.

Monitoring Well MW-112

DATE	Jan-99	Jan-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05				Positive Values	Negative Values	S
1,1-DCA (µg/L)	***5***	***25***	8.6	5.9	1.25	4.88	***1***						
		20	3.6	0.9	-3.75	-0.12	-4				3	3	
			-16.4	-19.1	-23.75	-20.12	-24				0	5	
				-2.7	-7.35	-3.72	-7.6				0	4	
					-4.65	-1.02	-4.9				0	3	
						3.63	-0.25				1	1	
							-3.88				0	1	
											4	17	-13

Ho = No concentration trend is present.

H_1 = A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

|S|= 13

p = 0.272

α = 0.1

No statistically significant 1,1-DCA concentration trend is indicated ($p>\alpha$).

Conclusion: No trend is present.

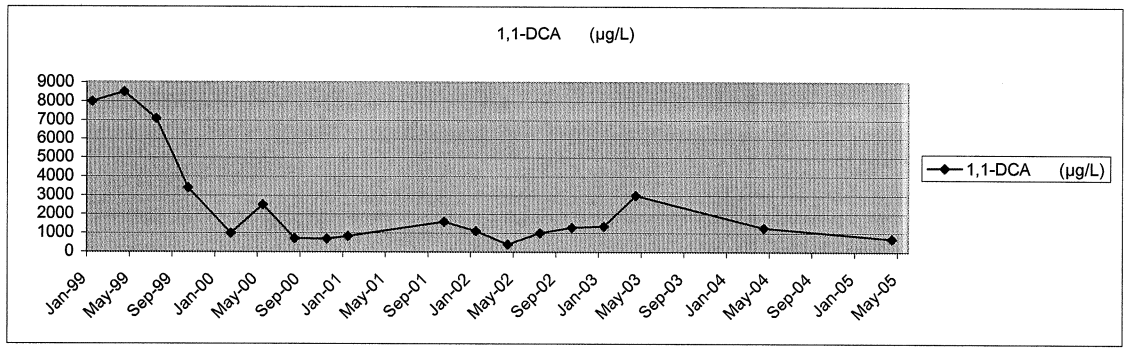
Notes:

5 Denotes detection limit value of a nondetect.

Monitoring Well MW-117

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCA (µg/L)	8000	8500	7100	3400	990	2500	710	690	830	1600	1100	413	1010	1300	1360	3000	1270	700			
		500	-900	-4600	-7010	-5500	-7290	-7310	-7170	-6400	-6900	-7587	-6990	-6700	-6640	-5000	-6730	-7300	1	16	
			-1400	-5100	-7510	-6000	-7790	-7810	-7670	-6900	-7400	-8087	-7490	-7200	-7140	-5500	-7230	-7800	0	16	
				-3700	-6110	-4600	-6390	-6410	-6270	-5500	-6000	-6687	-6090	-5800	-5740	-4100	-5830	-6400	0	15	
					-2410	-900	-2690	-2710	-2570	-1800	-2300	-2987	-2390	-2100	-2040	-400	-2130	-2700	0	14	
						1510	-280	-300	-160	610	110	-577	20	310	370	2010	280	-290	8	5	
							-1790	-1810	-1670	-900	-1400	-2087	-1490	-1200	-1140	500	-1230	-1800	1	11	
								-20	120	890	390	-297	300	590	650	2290	560	-10	8	3	
									140	910	410	-277	320	610	670	2310	580	10	9	1	
										770	270	-417	180	470	530	2170	440	-130	7	2	
											-500	-1187	-590	-300	-240	1400	-330	-900	1	7	
												-687	-90	200	260	1900	170	-400	4	3	
													597	887	947	2587	857	287	6	0	
														290	350	1990	260	-310	4	1	
															60	1700	-30	-600	2	2	
																1640	-90	-660	1	2	
																	-1730	-2300	0	2	
																		-570	0	1	
																			52	101	-49

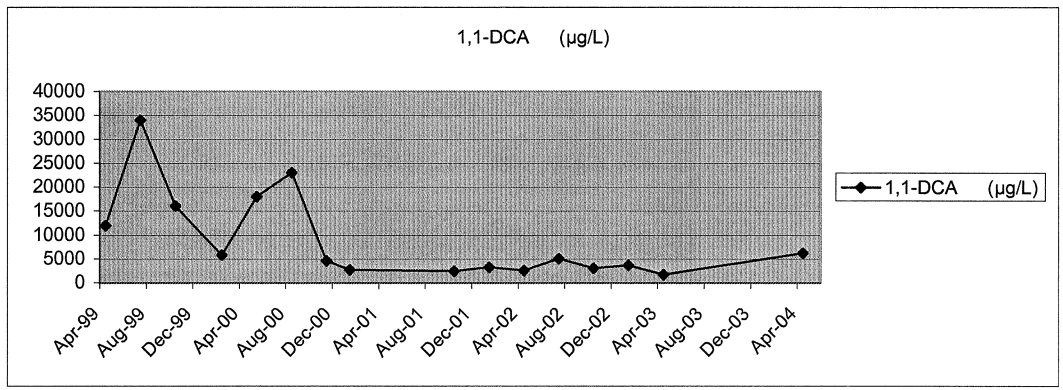
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 49
p = 0.152
α = 0.1
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value ($p<\alpha$) and (-) sign of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well MW-120

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Positive Values	Negative Values	S
1,1-DCA (µg/L)	12000	34000	16000	5800	18000	23000	4600	2700	2400	3200	2530	5040	3000	3630	1680	6190			
		22000	4000	-6200	6000	11000	-7400	-9300	-9600	-8800	-9470	-6960	-9000	-8370	-10320	-5810	4	11	
			-18000	-28200	-16000	-11000	-29400	-31300	-31600	-30800	-31470	-28960	-31000	-30370	-32320	-27810	0	14	
				-10200	2000	7000	-11400	-13300	-13600	-12800	-13470	-10960	-13000	-12370	-14320	-9810	2	11	
					12200	17200	-1200	-3100	-3400	-2600	-3270	-760	-2800	-2170	-4120	390	3	9	
						5000	-13400	-15300	-15600	-14800	-15470	-12960	-15000	-14370	-16320	-11810	1	10	
							-18400	-20300	-20600	-19800	-20470	-17960	-20000	-19370	-21320	-16810	0	10	
								-1900	-2200	-1400	-2070	440	-1600	-970	-2920	1590	2	7	
									-300	500	-170	2340	300	930	-1020	3490	5	3	
										800	130	2640	600	1230	-720	3790	6	1	
											-670	1840	-200	430	-1520	2990	3	3	
												2510	470	1100	-850	3660	4	1	
													-2040	-1410	-3360	1150	1	3	
														630	-1320	3190	2	1	
															-1950	2560	1	1	
																4510	1	0	
																	35	85	-50

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 50
p = 0.032
α = 0.1
A statistically significant decreasing 1,1-DCA concentration trend is indicated based on the p value (p<a) and (-) sign of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well MW-122A

DATE	Oct-99	Aug-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05			Positive Values	Negative Values	S
1,1-DCA (µg/L)	***100***	***25***	0.41	***10***	2.16	2.69	1.8					
		-75	-99.59	-90	-97.84	-97.31	-98.2			0	6	
			-24.59	-15	-22.84	-22.31	-23.2			0	5	
				9.59	1.75	2.28	1.39			4	0	
					-7.84	-7.31	-8.2			0	3	
						0.53	-0.36			1	1	
							-0.89			0	1	
										5	16	-11

Ho = No concentration trend is present.

H_1 = A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

|S|= 11

p = 0.272

α = 0.1

Analyte was detected in only 3 samples and the detection limits for nondetects are elevated with regard to detected concentrations.
Conclusion: No trend is discernible.

Notes:

100 Denotes detection limit value of a nondetect.

Monitoring Well C-1

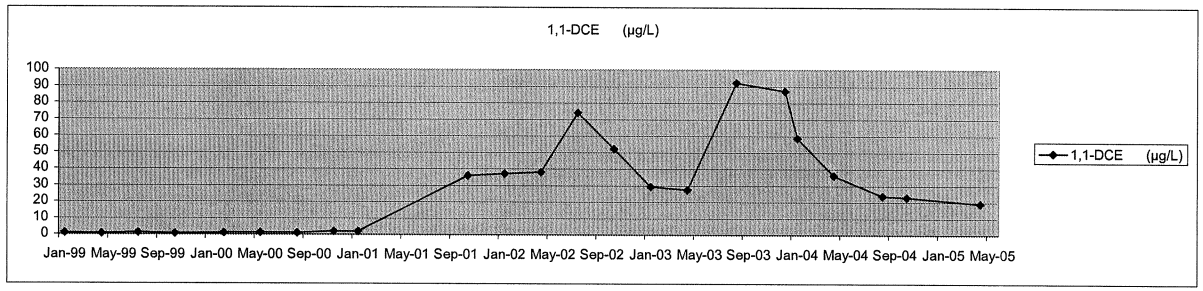
DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Aug-03	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	*1*	0.61	1.2	0.58	*1*	1.2	0.91	2	1.9	36	37	38.1	73.9	52	29.3	27.3	92.2	87.1	58.7	36.2	23.6	23	19			
		-0.39	0.2	-0.42	0	0.2	-0.09	1	0.9	35	36	37.1	72.9	51	28.3	26.3	91.2	86.1	57.7	35.2	22.6	22	18	18	3	
			0.59	-0.03	0.39	0.59	0.3	1.39	1.29	35.39	36.39	37.49	73.29	51.39	28.69	26.69	91.59	86.49	58.09	35.59	22.99	22.39	18.39	20	1	
				-0.62	-0.2	0	-0.29	0.8	0.7	34.8	35.8	36.9	72.7	50.8	28.1	26.1	91	85.9	57.5	35	22.4	21.8	17.8	16	3	
					0.42	0.62	0.33	1.42	1.32	35.42	36.42	37.52	73.32	51.42	28.72	26.72	91.62	86.52	58.12	35.62	23.02	22.42	18.42	19	0	
						0.2	-0.09	1	0.9	35	36	37.1	72.9	51	28.3	26.3	91.2	86.1	57.7	35.2	22.6	22	18	17	1	
							-0.29	0.8	0.7	34.8	35.8	36.9	72.7	50.8	28.1	26.1	91	85.9	57.5	35	22.4	21.8	17.8	16	1	
								1.09	0.99	35.09	36.09	37.19	72.99	51.09	28.39	26.39	91.29	86.19	57.79	35.29	22.69	22.09	18.09	16	0	
									-0.1	34	35	36.1	71.9	50	27.3	25.3	90.2	85.1	56.7	34.2	21.6	21	17	14	1	
										34.1	35.1	36.2	72	50.1	27.4	25.4	90.3	85.2	56.8	34.3	21.7	21.1	17.1	14	0	
											1	2.1	37.9	16	-6.7	-8.7	56.2	51.1	22.7	0.2	-12.4	-13	-17	8	5	
												1.1	36.9	15	-7.7	-9.7	55.2	50.1	21.7	-0.8	-13.4	-14	-18	6	6	
													35.8	13.9	-8.8	-10.8	54.1	49	20.6	-1.9	-14.5	-15.1	-19.1	5	6	
														-21.9	-44.6	-46.6	18.3	13.2	-15.2	-37.7	-50.3	-50.9	-54.9	2	8	
															-22.7	-24.7	40.2	35.1	6.7	-15.8	-28.4	-29	-33	3	6	
																-2	62.9	57.8	29.4	6.9	-5.7	-6.3	-10.3	4	4	
																	64.9	59.8	31.4	8.9	-3.7	-4.3	-8.3	4	3	
																		-5.1	-33.5	-56	-68.6	-69.2	-73.2	0	6	
																			-28.4	-50.9	-63.5	-64.1	-68.1	0	5	
																				-22.5	-35.1	-35.7	-39.7	0	4	
																					-12.6	-13.2	-17.2	0	3	
																						-0.6	-4.6	0	2	
																							-4	0	1	
																								144	65	79

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 23
|S|= 79
p < 0.0005
α = 0.1

A statistically significant increasing 1,1-DCE concentration trend is indicated by the p value (p<α) and (+) sign of the S value.

Conclusion: An increasing trend is present, and recent substantially higher concentrations are noted.

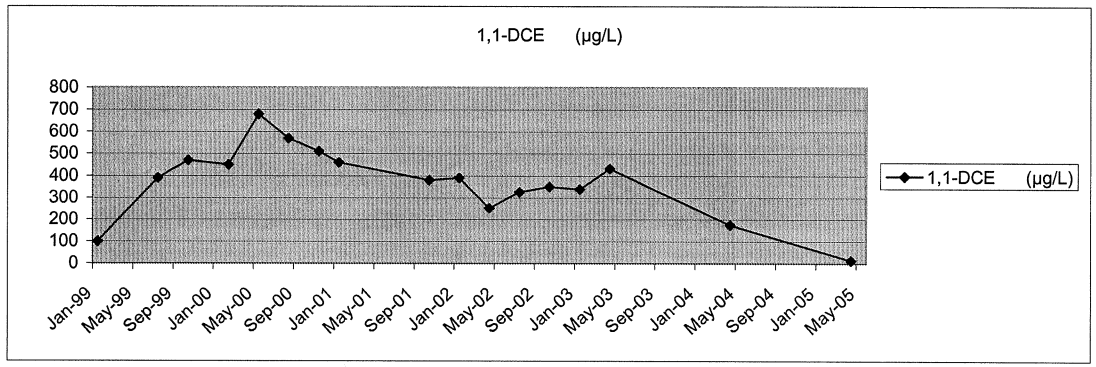
Notes:
1 Denotes detection limit value of a nondetect.



Monitoring Well C-2A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	100	390	470	450	680	570	510	460	380	390	251	326	350	338	432	173	13			
		290	370	350	580	470	410	360	280	290	151	226	250	238	332	73	-87	15	1	
			80	60	290	180	120	70	-10	0	-139	-64	-40	-52	42	-217	-377	7	7	
				-20	210	100	40	-10	-90	-80	-219	-144	-120	-132	-38	-297	-457	3	11	
					230	120	60	10	-70	-60	-199	-124	-100	-112	-18	-277	-437	4	9	
						-110	-170	-220	-300	-290	-429	-354	-330	-342	-248	-507	-667	0	12	
							-60	-110	-190	-180	-319	-244	-220	-232	-138	-397	-557	0	11	
								-50	-130	-120	-259	-184	-160	-172	-78	-337	-497	0	10	
									-80	-70	-209	-134	-110	-122	-28	-287	-447	0	9	
										10	-129	-54	-30	-42	52	-207	-367	2	6	
											-139	-64	-40	-52	42	-217	-377	1	6	
												75	99	87	181	-78	-238	4	2	
													24	12	106	-153	-313	3	2	
														-12	532	-177	-337	1	3	
															94	-165	-325	1	2	
																-259	-419	0	2	
																	-160	0	1	
																		41	94	-53

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 53
p = 0.106
α = 0.1
No statistically significant 1,1-DCE concentration trend is indicated ($p>\alpha$).
Conclusion: No trend is present.

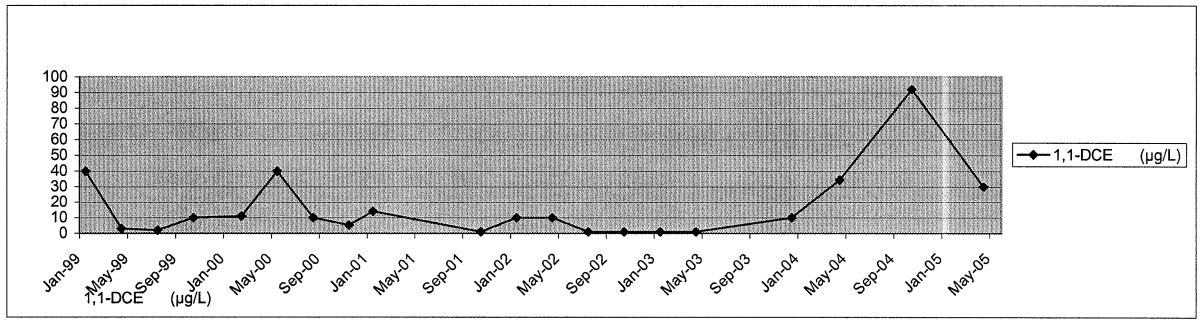


Monitoring Well C-3A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	***40***	3	***2***	***10***	11	40	***10***	5.4	14	***1***	***10***	***10***	***1***	***1***	***1***	0.935	***10***	34.4	92	30			
		-37	-38	-30	-29	0	-30	-34.6	-26	-39	-30	-30	-39	-39	-39	-39.065	-30	-5.6	52	-10	1	17	
			-1	7	8	37	7	2.4	11	-2	7	7	-2	-2	-2	-2.065	7	31.4	89	27	12	6	
				8	9	38	8	3.4	12	-1	8	8	-1	-1	-1	-1.065	8	32.4	90	28	12	5	
					1	30	0	-4.6	4	-9	0	0	-9	-9	-9	-9.065	0	24.4	82	20	6	6	
						29	-1	-5.6	3	-10	-1	-1	-10	-10	-10	-10.065	-1	23.4	81	19	5	10	
							-30	-34.6	-26	-39	-30	-30	-39	-39	-39	-39.065	-30	-5.6	52	-10	1	13	
								-4.6	4	-9	0	0	-9	-9	-9	-9.065	0	24.4	82	20	4	6	
									8.6	-4.4	4.6	4.6	-4.4	-4.4	-4.4	-4.465	4.6	29	86.6	24.6	7	5	
										-13	-4	-4	-13	-13	-13	-13.065	-4	20.4	78	16	3	8	
											9	9	0	0	0	-0.065	9	33.4	91	29	6	1	
												0	-9	-9	-9	-9.065	0	24.4	82	20	3	4	
													-9	-9	-9	-9.065	0	24.4	82	20	3	4	
														0	0	-0.065	9	33.4	91	29	4	1	
															0	-0.065	9	33.4	91	29	4	1	
																-0.065	9	33.4	91	29	4	1	
																	9.065	33.465	91.065	29.065	4	0	
																		24.4	82	20	3	0	
																			57.6	-4.4	1	1	
																				-62	0	1	
																					70	67	3

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 3
p = 0.647
α = 0.05
A majority of samples are nondetects.
Conclusion: No trend is discernible.

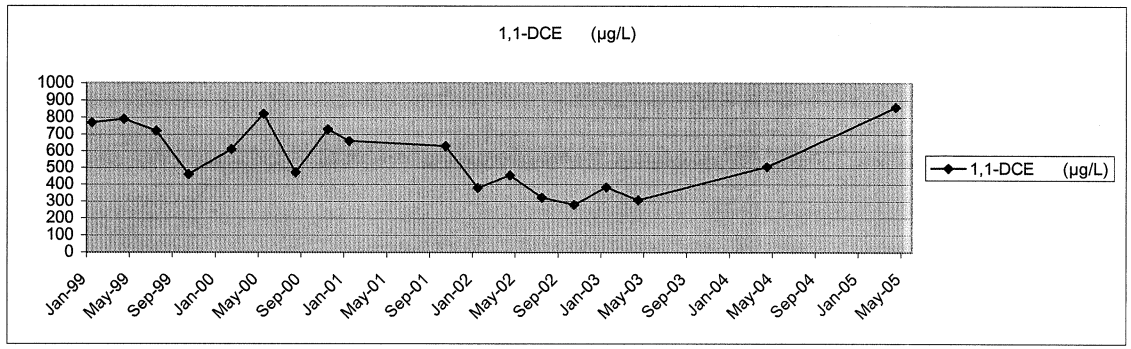
Notes:
40 Denotes detection limit value of a nondetect.



Monitoring Well C-4A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	770	790	720	460	610	820	470	730	660	630	380	453	323	280	383	308	504	860			
		20	-50	-310	-160	50	-300	-40	-110	-140	-390	-317	-447	-490	-387	-462	-266	90	3	14	
			-70	-330	-180	30	-320	-60	-130	-160	-410	-337	-467	-510	-407	-482	-286	70	2	14	
				-260	-110	100	-250	10	-60	-90	-340	-267	-397	-440	-337	-412	-216	140	3	12	
					150	360	10	270	200	170	-80	-7	-137	-180	-77	-152	44	400	8	6	
						210	-140	120	50	20	-230	-157	-287	-330	-227	-302	-106	250	5	8	
							-350	-90	-160	-190	-440	-367	-497	-540	-437	-512	-316	40	1	11	
								260	190	160	-90	-17	-147	-190	-87	-162	34	390	5	6	
									-70	-100	-350	-277	-407	-450	-347	-422	-226	130	1	9	
										-30	-280	-207	-337	-380	-277	-352	-156	200	1	8	
											-250	-177	-307	-350	-247	-322	-126	230	1	7	
												73	-57	-100	3	-72	124	480	4	3	
													-130	-173	-70	-145	51	407	2	4	
														-43	60	-15	181	537	3	2	
															103	28	224	580	4	0	
																-75	121	477	2	1	
																	196	552	2	0	
																		356	1	0	
																			48	105	-57

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 57
p < 0.0005
α = 0.1
A statistically significant decreasing 1,1-DCE concentration trend is indicated by the p value (p<α) and (-) sign of the S value.
Conclusion: Decreasing trend is present.

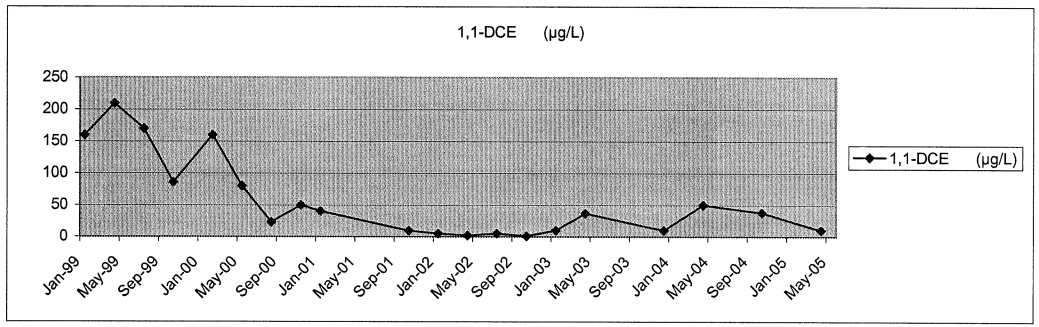


Monitoring Well C-5A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	160	210	170	86	160	80	23	***50***	40	9.5	5.1	2.01	4.98	***1***	***10***	36.8	***10***	***50***	***37.5***	***10***			
		50	10	-74	0	-80	-137	-110	-120	-150.5	-154.9	-157.99	-155.02	-159	-150	-123.2	-150	-110	-122.5	-150	2	16	
			-40	-124	-50	-130	-187	-160	-170	-200.5	-204.9	-207.99	-205.02	-209	-200	-173.2	-200	-160	-172.5	-200	0	18	
				-84	-10	-90	-147	-120	-130	-160.5	-164.9	-167.99	-165.02	-169	-160	-133.2	-160	-120	-132.5	-160	0	17	
					74	-6	-63	-36	-46	-76.5	-80.9	-83.99	-81.02	-85	-76	-49.2	-76	-36	-48.5	-76	1	15	
						-80	-137	-110	-120	-150.5	-154.9	-157.99	-155.02	-159	-150	-123.2	-150	-110	-122.5	-150	0	15	
							-57	-30	-40	-70.5	-74.9	-77.99	-75.02	-79	-70	-43.2	-70	-30	-42.5	-70	0	14	
								27	17	-13.5	-17.9	-20.99	-18.02	-22	-13	13.8	-13	27	14.5	-13	5	8	
									-10	-40.5	-44.9	-47.99	-45.02	-49	-40	-13.2	-40	0	-12.5	-40	0	11	
										-30.5	-34.9	-37.99	-35.02	-39	-30	-3.2	-30	10	-2.5	-30	1	10	
											-4.4	-7.49	-4.52	-8.5	0.5	27.3	0.5	40.5	28	0.5	6	4	
												-3.09	-0.12	-4.1	4.9	31.7	4.9	44.9	32.4	4.9	6	3	
													2.97	-1.01	7.99	34.79	7.99	47.99	35.49	7.99	7	1	
														-3.98	5.02	31.82	5.02	45.02	32.52	5.02	6	1	
															9	35.8	9	49	36.5	9	6	0	
																26.8	0	40	27.5	0	3	0	
																	-26.8	13.2	0.7	-26.8	2	2	
																		40	27.5	0	2	0	
																			-12.5	-40	0	2	
																				-27.5	0	1	
																					45	104	-59

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 59
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated based on the p level (p<α) and (-) of S value.
Conclusion: Decreasing trend is present.

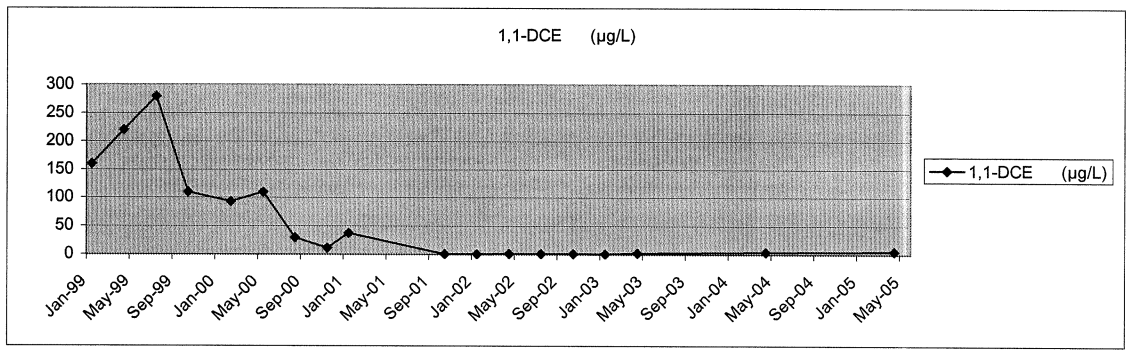
Notes:
50 Denotes detection limit value of a nondetect.



Monitoring Well C-5B

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	160	220	280	110	93	110	29	11	37	0.65	0.68	*1*	*1*	*1*	0.594	2.18	3.94	5.1			
		60	120	-50	-67	-50	-131	-149	-123	-159.35	-159.32	-159	-159	-159	-159.406	-157.82	-156.06	-154.9	2	15	
			60	-110	-127	-110	-191	-209	-183	-219.35	-219.32	-219	-219	-219	-219.406	-217.82	-216.06	-214.9	1	15	
				-170	-187	-170	-251	-269	-243	-279.35	-279.32	-279	-279	-279	-279.406	-277.82	-276.06	-274.9	0	15	
					-17	0	-81	-99	-73	-109.35	-109.32	-109	-109	-109	-109.406	-107.82	-106.06	-104.9	0	13	
						17	-64	-82	-56	-92.35	-92.32	-92	-92	-92	-92.406	-90.82	-89.06	-87.9	1	12	
							-81	-99	-73	-109.35	-109.32	-109	-109	-109	-109.406	-107.82	-106.06	-104.9	0	12	
								-18	8	-28.35	-28.32	-28	-28	-28	-28.406	-26.82	-25.06	-23.9	1	10	
									26	-10.35	-10.32	-10	-10	-10	-10.406	-8.82	-7.06	-5.9	1	9	
										-36.35	-36.32	-36	-36	-36	-36.406	-34.82	-33.06	-31.9	0	9	
											0.03	0.35	0.35	0.35	-0.056	1.53	3.29	4.45	7	1	
												0.32	0.32	0.32	-0.086	1.5	3.26	4.42	6	1	
													0	0	-0.406	1.18	2.94	4.1	3	1	
														0	-0.406	1.18	2.94	4.1	3	1	
															-0.406	1.18	2.94	4.1	3	1	
																1.586	3.346	4.506	3	0	
																	1.76	2.92	2	0	
																		1.16	1	0	
																			34	115	-81

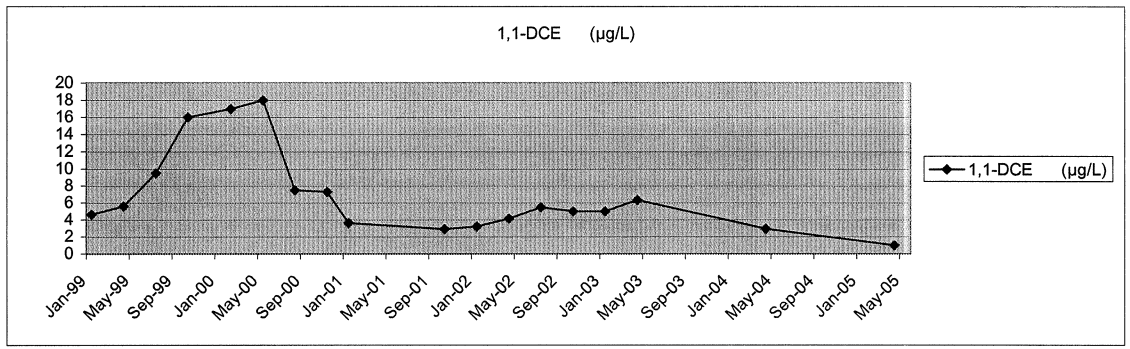
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 12
|S|= 81
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated (p<α). Conclusion: Decreasing trend is present.



Monitoring Well C-5C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	4.6	5.6	9.5	16	17	18	7.5	7.3	3.6	2.9	3.2	4.12	5.46	5	4.99	6.34	2.95	*1*			
		1	4.9	11.4	12.4	13.4	2.9	2.7	-1	-1.7	-1.4	-0.48	0.86	0.4	0.39	1.74	-1.65	-3.6	11	6	
			3.9	10.4	11.4	12.4	1.9	1.7	-2	-2.7	-2.4	-1.48	-0.14	-0.6	-0.61	0.74	-2.65	-4.6	7	9	
				6.5	7.5	8.5	-2	-2.2	-5.9	-6.6	-6.3	-5.38	-4.04	-4.5	-4.51	-3.16	-6.55	-8.5	3	12	
					1	2	-8.5	-8.7	-12.4	-13.1	-12.8	-11.88	-10.54	-11	-11.01	-9.66	-13.05	-15	2	12	
						1	-9.5	-9.7	-13.4	-14.1	-13.8	-12.88	-11.54	-12	-12.01	-10.66	-14.05	-16	1	12	
							-10.5	-10.7	-14.4	-15.1	-14.8	-13.88	-12.54	-13	-13.01	-11.66	-15.05	-17	0	12	
								-0.2	-3.9	-4.6	-4.3	-3.38	-2.04	-2.5	-2.51	-1.16	-4.55	-6.5	0	11	
									-3.7	-4.4	-4.1	-3.18	-1.84	-2.3	-2.31	-0.96	-4.35	-6.3	0	10	
										-0.7	-0.4	0.52	1.86	1.4	1.39	2.74	-0.65	-2.6	5	4	
											0.3	1.22	2.56	2.1	2.09	3.44	0.05	-1.9	7	1	
												0.92	2.26	1.8	1.79	3.14	-0.25	-2.2	5	2	
													1.34	0.88	0.87	2.22	-1.17	-3.12	4	2	
														-0.46	-0.47	0.88	-2.51	-4.46	1	4	
															-0.01	1.34	-2.05	-4	1	3	
																1.35	-2.04	-3.99	1	2	
																	-3.39	-5.34	0	2	
																		-1.95	0	1	
																			48	105	-57

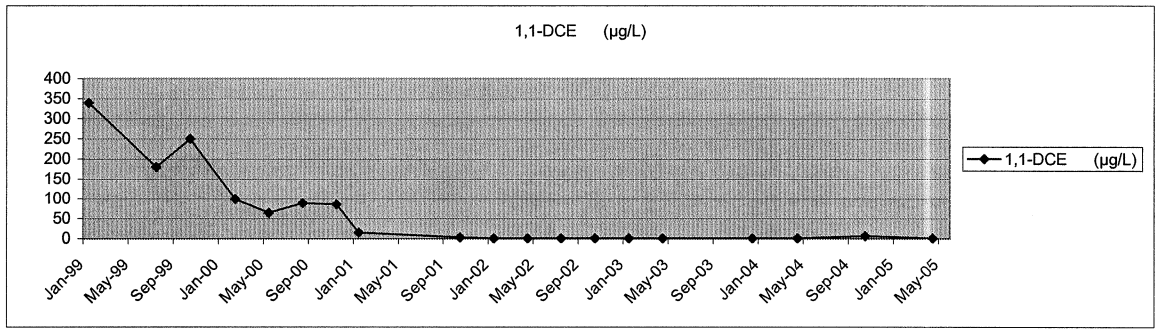
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 57
p = 0.054
α = 0.05
No statistically significant decreasing 1,1-DCE concentration trend is indicated ($p>\alpha$).
Conclusion: No statistical decreasing (or increasing) trend is present; however, the graphic illustration shows a decreasing trend.



Monitoring Well C-7A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	340	180	250	99	64	89	86	15	3.3	0.72	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*6.01*	*1*			
		-160	-90	-241	-276	-251	-254	-325	-336.7	-339.28	-339	-339	-339	-339	-339	-339	-339	-333.99	-339	0	18	
			70	-81	-116	-91	-94	-165	-176.7	-179.28	-179	-179	-179	-179	-179	-179	-179	-173.99	-179	1	16	
				-151	-186	-161	-164	-235	-246.7	-249.28	-249	-249	-249	-249	-249	-249	-249	-243.99	-249	0	16	
					-35	-10	-13	-84	-95.7	-98.28	-98	-98	-98	-98	-98	-98	-98	-92.99	-98	0	15	
						25	22	-49	-60.7	-63.28	-63	-63	-63	-63	-63	-63	-63	-57.99	-63	2	12	
							-3	-74	-85.7	-88.28	-88	-88	-88	-88	-88	-88	-88	-82.99	-88	0	13	
								-71	-82.7	-85.28	-85	-85	-85	-85	-85	-85	-85	-79.99	-85	0	12	
									-11.7	-14.28	-14	-14	-14	-14	-14	-14	-14	-8.99	-14	0	11	
										-2.58	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	2.71	-2.3	1	9	
											0.28	0.28	0.28	0.28	0.28	0.28	0.28	5.29	0.28	9	0	
												0	0	0	0	0	0	5.01	0	1	0	
													0	0	0	0	0	5.01	0	1	0	
														0	0	0	0	5.01	0	1	0	
															0	0	0	5.01	0	1	0	
																0	0	5.01	0	1	0	
																	0	5.01	0	1	0	
																		5.01	0	1	0	
																			-5.01	0	1	
																				19	89	-70

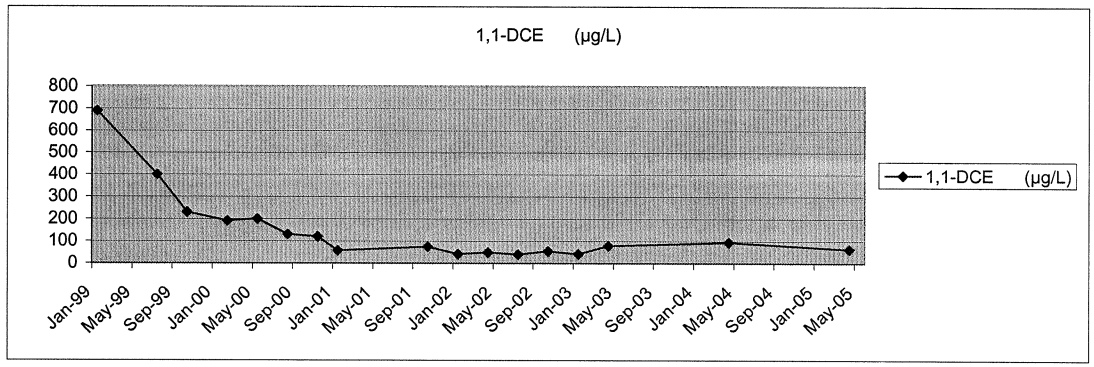
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 19
|S|= 70
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated (p<α) and sign (-) of the S value. Conclusion: Decreasing trend is present.



Monitoring Well C-8A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	690	400	230	190	200	130	120	58	74	42	48.1	40.2	54	41.6	78.2	95.2	63.0			
		-290	-460	-500	-490	-560	-570	-632	-616	-648	-641.9	-649.8	-636	-648.4	-611.8	-594.8	-627	0	16	
			-170	-210	-200	-270	-280	-342	-326	-358	-351.9	-359.8	-346	-358.4	-321.8	-304.8	-337	0	15	
				-40	-30	-100	-110	-172	-156	-188	-181.9	-189.8	-176	-188.4	-151.8	-134.8	-167	0	14	
					10	-60	-70	-132	-116	-148	-141.9	-149.8	-136	-148.4	-111.8	-94.8	-127	1	12	
						-70	-80	-142	-126	-158	-151.9	-159.8	-146	-158.4	-121.8	-104.8	-137	0	12	
							-10	-72	-56	-88	-81.9	-89.8	-76	-88.4	-51.8	-34.8	-67	0	11	
								-62	-46	-78	-71.9	-79.8	-66	-78.4	-41.8	-24.8	-57	0	10	
									16	-16	-9.9	-17.8	-4	-16.4	20.2	37.2	5	4	5	
										-32	-25.9	-33.8	-20	-32.4	4.2	21.2	-11	2	6	
											6.1	-1.8	12	-0.4	36.2	53.2	21.0	5	2	
												-7.9	5.9	-6.5	30.1	47.1	14.9	4	2	
													13.8	1.4	38.0	55.0	22.8	5	0	
														-12.4	24.2	41.2	9.0	3	1	
															36.6	53.6	21.4	3	0	
																17.0	-15.2	1	1	
																	-32.2	0	1	
																		28	108	-80

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 80
p < 0.0005
α = 0.1
A statistically significant decreasing 1,1-DCE concentration trend is indicated by the p value (p<α) and the (-) sign of the S value.
Conclusion: Decreasing trend is present.

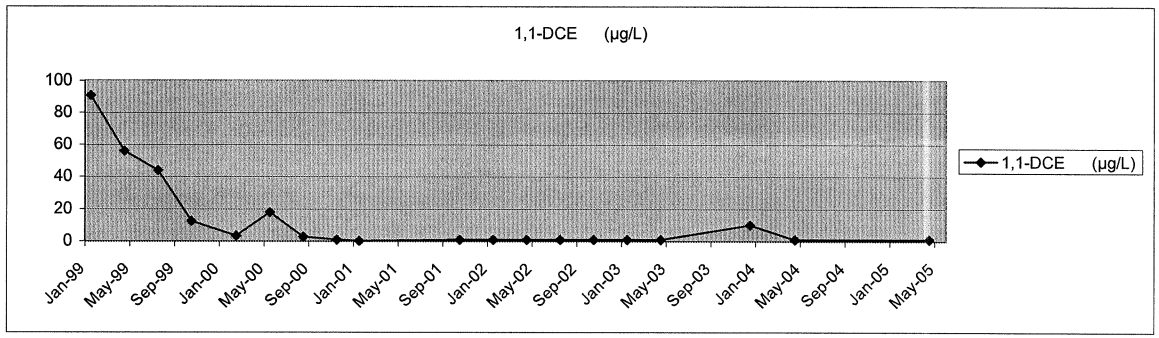


Monitoring Well C-9A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	91	56	44	***12.5***	3.3	18	2.7	0.9	0.26	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***10***	***1***	***1***			
		-35	-47	-78.5	-87.7	-73	-88.3	-90.1	-90.74	-90	-90	-90	-90	-90	-90	-90	-81	-90	-90	0	18	
			-12	-43.5	-52.7	-38	-53.3	-55.1	-55.74	-55	-55	-55	-55	-55	-55	-55	-46	-55	-55	0	17	
				-31.5	-40.7	-26	-41.3	-43.1	-43.74	-43	-43	-43	-43	-43	-43	-43	-34	-43	-43	0	16	
					-9.2	5.5	-9.8	-11.6	-12.24	-11.5	-11.5	-11.5	-11.5	-11.5	-11.5	-11.5	-2.5	-11.5	-11.5	1	14	
						14.7	-0.6	-2.4	-3.04	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	6.7	-2.3	-2.3	2	12	
							-15.3	-17.1	-17.74	-17	-17	-17	-17	-17	-17	-17	-8	-17	-17	0	13	
								-1.8	-2.44	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	7.3	-1.7	-1.7	1	11	
									-0.64	0.1	0.1	0.1	0.1	0.1	0.1	0.1	9.1	0.1	0.1	10	1	
										0.74	0.74	0.74	0.74	0.74	0.74	0.74	9.74	0.74	0.74	10	0	
											0	0	0	0	0	0	9	0	0	1	0	
												0	0	0	0	0	9	0	0	1	0	
													0	0	0	0	9	0	0	1	0	
														0	0	0	9	0	0	1	0	
															0	0	9	0	0	1	0	
																0	9	0	0	1	0	
																	9	0	0	1	0	
																		-9	-9	0	2	
																			0	0	0	
																				31	104	-73

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 73
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated based on p value (p<α) and (-) of S value.
Conclusion: Decreasing trend is present.

Notes:
12.5 Denotes 0.5X detection limit value of a nondetect.

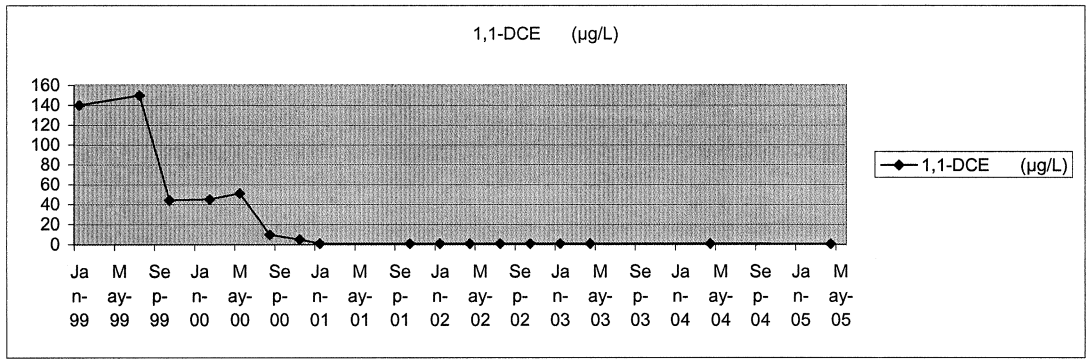


Monitoring Well C-9B

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	140	150	44	45	51	10	5	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*0.5*			
		10	-96	-95	-89	-130	-135	-139	-139	-139	-139	-139	-139	-139	-139	-139	-139.5	1	15	
			-106	-105	-99	-140	-145	-149	-149	-149	-149	-149	-149	-149	-149	-149	-149.5	0	15	
				1	7	-34	-39	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43.5	2	12	
					6	-35	-40	-44	-44	-44	-44	-44	-44	-44	-44	-44	-44.5	1	12	
						-41	-46	-50	-50	-50	-50	-50	-50	-50	-50	-50	-50.5	0	12	
							-5	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9.5	0	11	
								-4	-4	-4	-4	-4	-4	-4	-4	-4	-4.5	0	10	
									0	0	0	0	0	0	0	0	-0.5	0	1	
										0	0	0	0	0	0	0	-0.5	0	1	
											0	0	0	0	0	0	-0.5	0	1	
												0	0	0	0	0	-0.5	0	1	
													0	0	0	0	-0.5	0	1	
														0	0	0	-0.5	0	1	
															0	0	-0.5	0	1	
																0	-0.5	0	1	
																	-0.5	0	1	
																		4	96	-92

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 13
|S|= 92
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated based on p level (p<α) and (-) of S value.
Conclusion: Decreasing trend is present.

Notes:
1 Denotes detection limit value of a nondetect.



Monitoring Well C-9C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	3	2.7	1.2	2	*1*	0.54	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*			
		-0.3	-1.8	-1	-2	-2.46	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	17	
			-1.5	-0.7	-1.7	-2.16	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	0	16	
				0.8	-0.2	-0.66	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	1	14	
					-1	-1.46	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	0	14	
						-0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
							0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	12	0	
								0	0	0	0	0	0	0	0	0	0	0	0	0	
									0	0	0	0	0	0	0	0	0	0	0	0	
										0	0	0	0	0	0	0	0	0	0	0	
											0	0	0	0	0	0	0	0	0	0	
												0	0	0	0	0	0	0	0	0	
													0	0	0	0	0	0	0	0	
														0	0	0	0	0	0	0	
															0	0	0	0	0	0	
																0	0	0	0	0	
																	0	0	0	0	
																		0	0	0	
																			13	62	-49

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 14
|S|= 49
p = 0.006
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated ($p<\alpha$), although the number of nondetects casts uncertainty on the p value.
Conclusion: Decreasing trend is present; last 11 samples are nondetects.

Notes:
1 Denotes detection limit value of a nondetect.

Monitoring Well C-10

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Oct-04	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	1	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*			
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
									0	0	0	0	0	0	0	0	0	0	0	0	0	0	
										0	0	0	0	0	0	0	0	0	0	0	0	0	
											0	0	0	0	0	0	0	0	0	0	0	0	
												0	0	0	0	0	0	0	0	0	0	0	
													0	0	0	0	0	0	0	0	0	0	
														0	0	0	0	0	0	0	0	0	
															0	0	0	0	0	0	0	0	
																0	0	0	0	0	0	0	
																	0	0	0	0	0	0	
																		0	0	0	0	0	
																			0	0	0	0	
																				0	0	0	
																					0	0	0

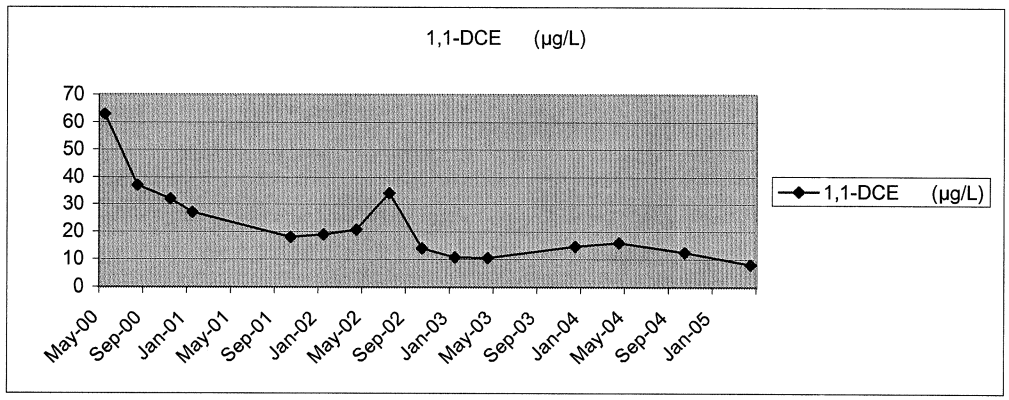
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 14
|S|= *
p = *
α = 0.1
*Analyte was detected only in the Jan 1999 sample; a Mann Kendall test is not necessary or appropriate. Conclusion: No trend is discernible; all but one sample are nondetects.

Notes:
1 Denotes detection limit value of a nondetect.

Monitoring Well C-11

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	63	37	32	27	18	19	20.7	34.1	14	10.7	10.5	14.7	15.9	12.5	8			
		-26	-31	-36	-45	-44	-42.3	-28.9	-49	-52.3	-52.5	-48.3	-47.1	-50.5	-55	0	14	
			-5	-10	-19	-18	-16.3	-2.9	-23	-26.3	-26.5	-22.3	-21.1	-24.5	-29	0	13	
				-5	-14	-13	-11.3	2.1	-18	-21.3	-21.5	-17.3	-16.1	-19.5	-24	1	11	
					-9	-8	-6.3	7.1	-13	-16.3	-16.5	-12.3	-11.1	-14.5	-19	1	10	
						1	2.7	16.1	-4	-7.3	-7.5	-3.3	-2.1	-5.5	-10	3	7	
							1.7	15.1	-5	-8.3	-8.5	-4.3	-3.1	-6.5	-11	2	7	
								13.4	-6.7	-10	-10.2	-6	-4.8	-8.2	-12.7	1	7	
									-20.1	-23.4	-23.6	-19.4	-18.2	-21.6	-26.1	0	7	
										-3.3	-3.5	0.7	1.9	-1.5	-6	2	4	
											-0.2	4	5.2	1.8	-2.7	3	2	
												4.2	5.4	2	-2.5	3	1	
													1.2	-2.2	-6.7	1	2	
														-3.4	-7.9	0	2	
															-4.5	0	1	
																17	88	-71

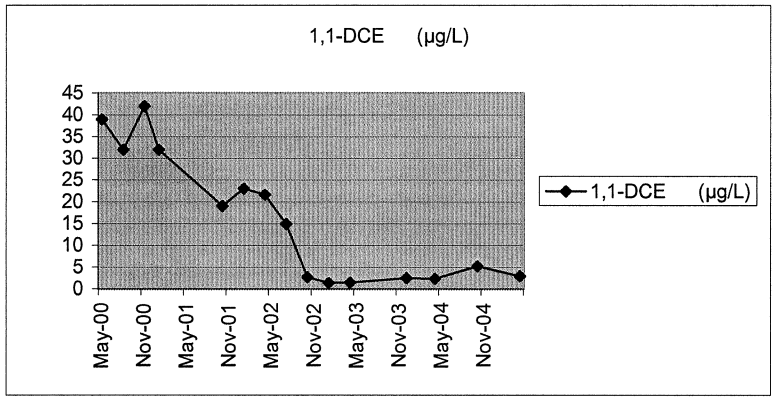
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 71
p = < 0.005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated based on p level ($p<\alpha$) and (-) of S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-12

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	39	32	42	32	19	23	21.6	14.9	2.7	1.38	1.44	2.5	2.37	5.16	2.9			
		-7	3	-7	-20	-16	-17.4	-24.1	-36.3	-37.62	-37.56	-36.5	-36.63	-33.84	-36.1	1	13	
			10	0	-13	-9	-10.4	-17.1	-29.3	-30.62	-30.56	-29.5	-29.63	-26.84	-29.1	1	11	
				-10	-23	-19	-20.4	-27.1	-39.3	-40.62	-40.56	-39.5	-39.63	-36.84	-39.1	0	12	
					-13	-9	-10.4	-17.1	-29.3	-30.62	-30.56	-29.5	-29.63	-26.84	-29.1	0	11	
						4	2.6	-4.1	-16.3	-17.62	-17.56	-16.5	-16.63	-13.84	-16.1	2	8	
							-1.4	-8.1	-20.3	-21.62	-21.56	-20.5	-20.63	-17.84	-20.1	0	9	
								-6.7	-18.9	-20.22	-20.16	-19.1	-19.23	-16.44	-18.7	0	8	
									-12.2	-13.52	-13.46	-12.4	-12.53	-9.74	-12	0	7	
										-1.32	-1.26	-0.2	-0.33	2.46	0.2	2	4	
											0.06	1.12	0.99	3.78	1.52	5	0	
												1.06	0.93	3.72	1.46	4	0	
													-0.13	2.66	0.4	2	1	
														2.79	0.53	2	0	
															-2.26	0	1	
																19	85	-66

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 66
$p < 0.0005$
$\alpha = 0.05$
A statistically significant decreasing 1,1-DCE concentration trend is indicated by the p value ($p<\alpha$) and sign (-) of the S value.
Conclusion: A decreasing trend is present.



Monitoring Well C-13

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
*1,1-DCE (µg/L)	*20*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*5*			
		-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-19	-15	0	14	
			0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	
				0	0	0	0	0	0	0	0	0	0	0	4	1	0	
					0	0	0	0	0	0	0	0	0	0	4	1	0	
						0	0	0	0	0	0	0	0	0	4	1	0	
							0	0	0	0	0	0	0	0	4	1	0	
								0	0	0	0	0	0	0	4	1	0	
									0	0	0	0	0	0	4	1	0	
										0	0	0	0	0	4	1	0	
											0	0	0	0	4	1	0	
												0	0	0	4	1	0	
													0	0	4	1	0	
														0	4	1	0	
															4	1	0	
																13	14	-1

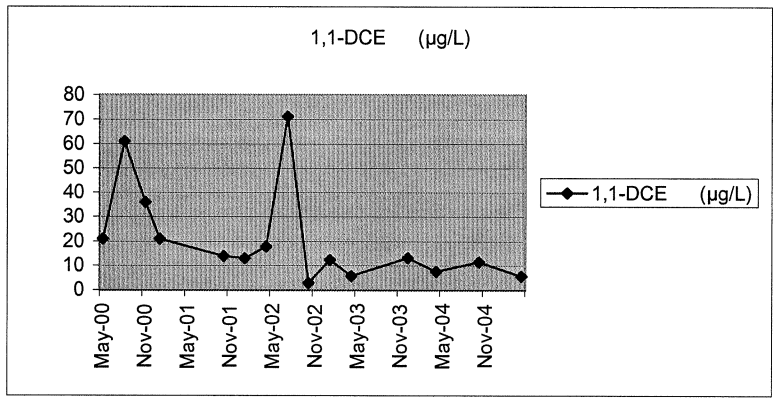
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= *
p = *
α = 0.05
*1,1-DCE was not detected in any of the 14 sampling rounds; a Mann Kendall test is not necessary or appropriate. Conclusion: No trend is discernible; all samples are nondetects.

Notes:
20 Denotes detection limit value of a nondetect.

Monitoring Well C-14

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	21	61	36	21	14	13	17.8	71.1	2.9	12.4	5.79	13.1	7.53	11.5	5.6			
		40	15	0	-7	-8	-3.2	50.1	-18.1	-8.6	-15.21	-7.9	-13.47	-9.5	-15.4	3	10	
			-25	-40	-47	-48	-43.2	10.1	-58.1	-48.6	-55.21	-47.9	-53.47	-49.5	-55.4	1	12	
				-15	-22	-23	-18.2	35.1	-33.1	-23.6	-30.21	-22.9	-28.47	-24.5	-30.4	1	11	
					-7	-8	-3.2	50.1	-18.1	-8.6	-15.21	-7.9	-13.47	-9.5	-15.4	1	10	
						-1	3.8	57.1	-11.1	-1.6	-8.21	-0.9	-6.47	-2.5	-8.4	2	8	
							4.8	58.1	-10.1	-0.6	-7.21	0.1	-5.47	-1.5	-7.4	3	6	
								53.3	-14.9	-5.4	-12.01	-4.7	-10.27	-6.3	-12.2	1	7	
									-68.2	-58.7	-65.31	-58	-63.57	-59.6	-65.5	0	7	
										9.5	2.89	10.2	4.63	8.6	2.7	6	0	
											-6.61	0.7	-4.87	-0.9	-6.8	1	4	
												7.31	1.74	5.71	-0.19	3	1	
													-5.57	-1.6	-7.5	0	3	
														3.97	-1.93	1	1	
															-5.9	0	1	
																23	81	-58

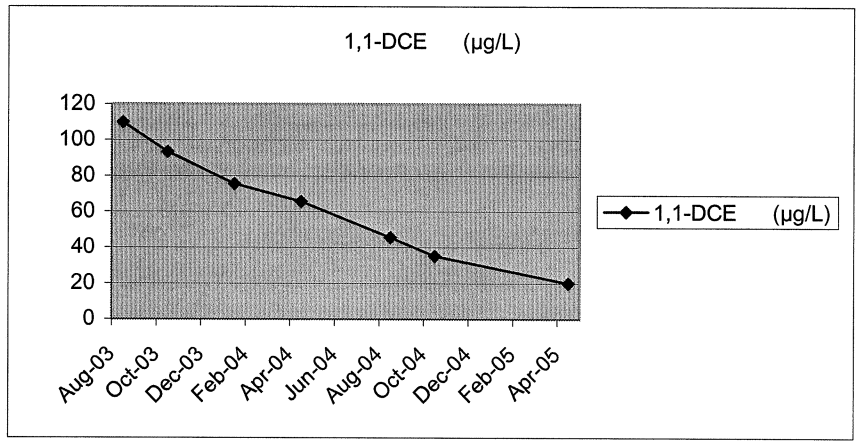
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 58
p = < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated based on p level ($p<\alpha$) and (-) of S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-15

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05				Positive Values	Negative Values	S
1,1-DCE (µg/L)	110	93.3	75.5	65.5	45.5	35	20						
		-16.7	-34.5	-44.5	-64.5	-75	-90				0	6	
			-17.8	-27.8	-47.8	-58.3	-73.3				0	5	
				-10	-30	-40.5	-55.5				0	4	
					-20	-30.5	-45.5				0	3	
						-10.5	-25.5				0	2	
							-15				0	1	
											0	0	
											0	0	
											0	0	
											0	0	
											0	0	
											0	0	
											0	21	-21

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 21
p = < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated based on p level ($p<\alpha$) and (-) of S value.
Conclusion: Decreasing trend is present.

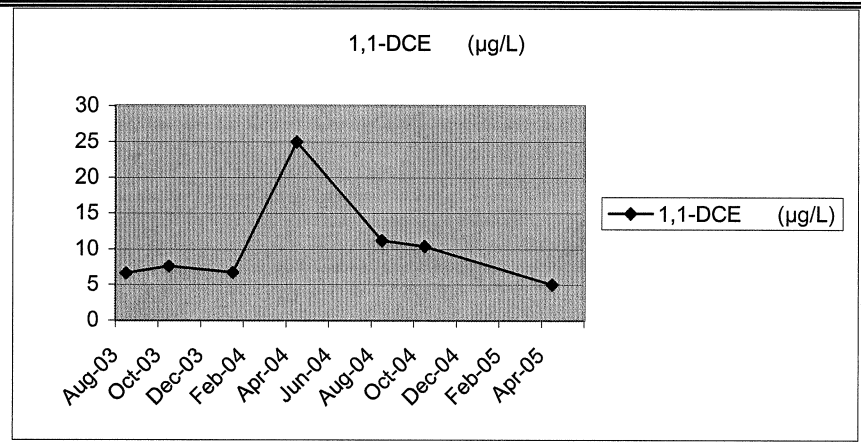


Monitoring Well C-16

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCE (µg/L)	6.59	7.58	6.69	***25***	11.2	10.4	***5***							
		0.99	0.1	18.41	4.61	3.81	-1.59					5	1	
			-0.89	17.42	3.62	2.82	-2.58					3	2	
				18.31	4.51	3.71	-1.69					3	1	
					-13.8	-14.6	-20					0	3	
						-0.8	-6.2					0	2	
							-5.4					0	1	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												11	10	1

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 1
p = 0.875
α = 0.05

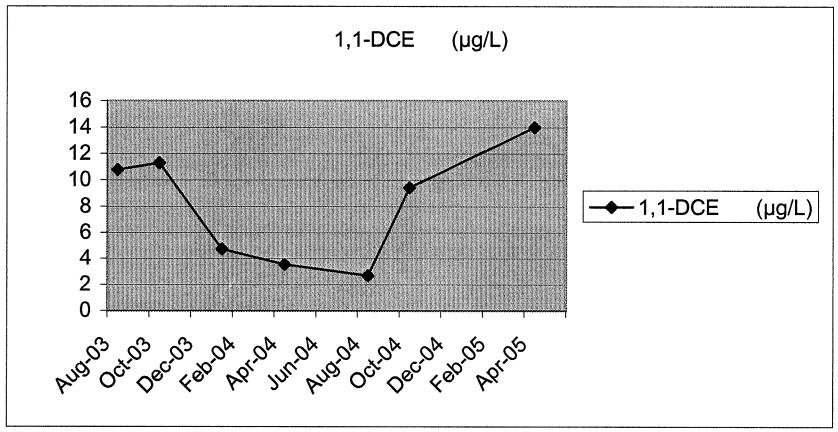
No statistically significant 1,1-DCE concentration trend is indicated. Because 1,1-DCE was only detected in 3 of the 4 sampling rounds, it casts uncertainty to the p value. Conclusion: Decreasing trend is present.



Monitoring Well C-17

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCE (µg/L)	10.8	11.3	4.73	3.54	2.68	9.43	14							
		0.5	-6.07	-7.26	-8.12	-1.37	3.2					2	4	
			-6.57	-7.76	-8.62	-1.87	2.7					1	4	
				-1.19	-2.05	4.7	9.27					2	2	
					-0.86	5.89	10.46					2	1	
						6.75	11.32					2	0	
							4.57					1	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												10	11	-1

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 1
p = 0.875
α = 0.05
No statistically significant 1,1-DCE concentration trend is indicated ($p>\alpha$).
Conclusion: Statistically decreasing trend is present; however, the graphic illustration shows an increase from October 2004 to April 2005.



Monitoring Well C-18

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCE (µg/L)	3.44	*1*	*1*	*1*	*1*	*1*	*1*							
		-2.44	-2.44	-2.44	-2.44	-2.44	-2.44					0	6	
			0	0	0	0	0					0	0	
				0	0	0	0					0	0	
					0	0	0					0	0	
						0	0					0	0	
							0					0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	6	-6

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 6
p = 0.009
α = 0.05

No statistically significant 1,1-DCE concentration trend is indicated. Because 1,1-DCE was only detected in 1 of the 7 sampling rounds, it casts uncertainty to the p value. Conclusion: Decreasing trend is present.

Monitoring Well C-19

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
1,1-DCE (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	*1*							
		0	0	0	0	0	0					0	0	
			0	0	0	0	0					0	0	
				0	0	0	0					0	0	
					0	0	0					0	0	
						0	0					0	0	
							0					0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	0

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 0
p = *
α = 0.05

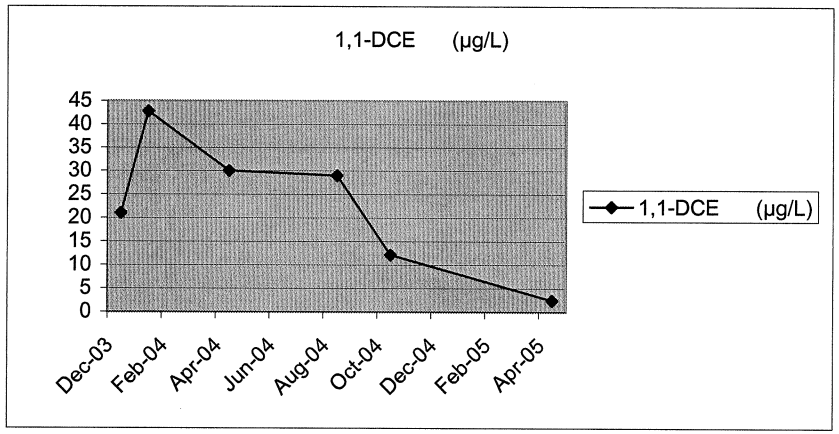
* 1,1-DCE was not detected in any of the 7 samples; therefore, a Kendall-Mann test is not necessary nor appropriate.

Conclusion: No trend is discernible; all samples are nondetects.

Monitoring Well C-20

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
1,1-DCE (µg/L)	21	42.8	30	29	12.1	2.4								
		21.8	9	8	-8.9	-18.6						3	2	
			-12.8	-13.8	-30.7	-40.4						0	4	
				-1	-17.9	-27.6						0	3	
					-16.9	-26.6						0	2	
						-9.7						0	1	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												3	12	-9

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 6
|S|= 9
p = < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated based on ($p>\alpha$) and sign (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-21

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
1,1-DCE (µg/L)	21	*1*	*1*	*1*	*1*	*1*								
		-20	-20	-20	-20	-20						0	5	
			0	0	0	0						0	0	
				0	0	0						0	0	
					0	0						0	0	
						0						0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	5	-5

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 6
|S|= 5
p = *
α = 0.05
* 1,1-DCE was only detected in 1 of the 6 samples; therefore, a Kendall-Mann test is necessary nor appropriate.
Conclusion: No trend is discernible..

Monitoring Well MW-105

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	1	*1*	*1*	*1*	*1*	*1*	0.8	1.5	0.58	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*			
		0	0	0	0	0	-0.2	0.5	-0.42	0	0	0	0	0	0	0	0	1	2	
			0	0	0	0	-0.2	0.5	-0.42	0	0	0	0	0	0	0	0	1	2	
				0	0	0	-0.2	0.5	-0.42	0	0	0	0	0	0	0	0	1	2	
					0	0	-0.2	0.5	-0.42	0	0	0	0	0	0	0	0	1	2	
						0	-0.2	0.5	-0.42	0	0	0	0	0	0	0	0	1	2	
							-0.2	0.5	-0.42	0	0	0	0	0	0	0	0	1	2	
								0.7	-0.22	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	9	1	
									-0.92	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	0	9	
										0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	8	0	
											0	0	0	0	0	0	0	0	0	
												0	0	0	0	0	0	0	0	
													0	0	0	0	0	0	0	
														0	0	0	0	0	0	
															0	0	0	0	0	
																0	0	0	0	
																	0	0	0	
																		23	22	1

Ho = No decreasing concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 1
p = 0.94
α = 0.1
No statistically significant trend is indicated ($p>\alpha$); detected in only 3 of 16 samples.
Conclusion: No trend is present.

Notes:
1 Denotes detection limit value of a nondetect.

Monitoring Well MW-112

DATE	Jan-99	Feb-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05					Positive Values	Negative Values	S
1,1-DCE (µg/L)	***5***	***25***	0.38	***2***	***2***	***5***	***1***							
		20	-4.62	-3	-3	0	-4					1	4	
			-24.62	-23	-23	-20	-24					0	5	
				1.62	1.62	4.62	0.62					4	0	
					0	3	-1					1	1	
						3	-1					1	1	
							-4					0	1	
												7	12	-5

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 6
|S|= 5
p = *
α = 0.1
*Analyte was detected in only 1 of 6 samples. Therefore, a Mann Kendall test is not appropriate.
Conclusion: No trend is discernible.

Notes:
5 Denotes detection limit value of a nondetect.

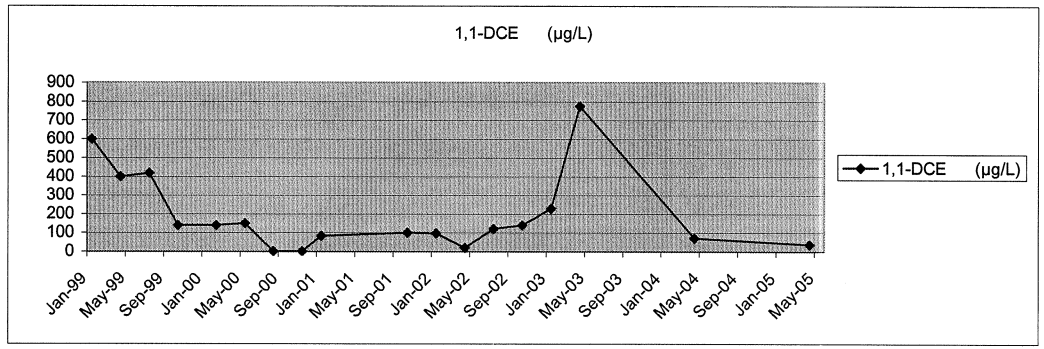
Monitoring Well MW-117

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
1,1-DCE (µg/L)	600	400	420	140	140	150	*1*	*1*	83	100	98	21.2	121	140	228	775	72.2	37			
		-200	-180	-460	-460	-450	-599	-599	-517	-500	-502	-578.8	-479	-460	-372	175	-527.8	-563	1	16	
			20	-260	-260	-250	-399	-399	-317	-300	-302	-378.8	-279	-260	-172	375	-327.8	-363	2	14	
				-280	-280	-270	-419	-419	-337	-320	-322	-398.8	-299	-280	-192	355	-347.8	-383	1	14	
					0	10	-139	-139	-57	-40	-42	-118.8	-19	0	88	635	-67.8	-103	3	9	
						10	-139	-139	-57	-40	-42	-118.8	-19	0	88	635	-67.8	-103	3	9	
							-149	-149	-67	-50	-52	-128.8	-29	-10	78	625	-77.8	-113	2	10	
								0	82	99	97	20.2	120	139	227	774	71.2	36	10	0	
									82	99	97	20.2	120	139	227	774	71.2	36	10	0	
										17	15	-61.8	38	57	145	692	-10.8	-46	6	3	
											-2	-78.8	21	40	128	675	-27.8	-63	4	4	
												-76.8	23	42	130	677	-25.8	-61	4	3	
													99.8	118.8	206.8	753.8	51	15.8	6	0	
														19	107	654	-48.8	-84	3	2	
															88	635	-67.8	-103	2	2	
																547	-155.8	-191	1	2	
																	-702.8	-738	0	2	
																		-35.2	0	1	
																			58	91	-33

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 33
p = 0.392
α = 0.1

No overall statistically significant 1,1-DCE concentration trend is indicated by the p value ($p>\alpha$). However, a decreasing trend from January 1999 to August 2000 (p=0.05; S=-14; n=7) is followed by an increasing trend (p=0.014; S=+20; n=8) from August 2000 to January 2003.
Conclusion: No overall trend is present; notable significant trends exist within subsets of the data.

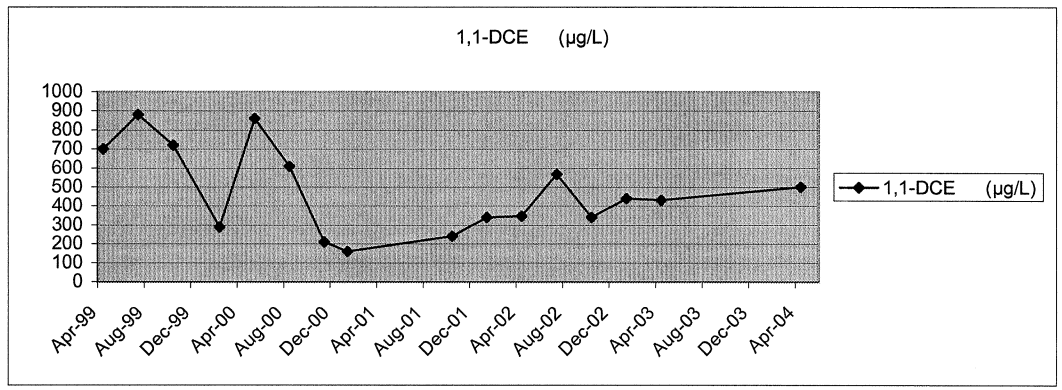
Notes:
1 Denotes detection limit value of a nondetect.



Monitoring Well MW-120

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Positive Values	Negative Values	S
1,1-DCE (µg/L)	700	880	720	290	860	610	210	160	240	340	346	567	340	440	431	500			
		180	20	-410	160	-90	-490	-540	-460	-360	-354	-133	-360	-260	-269	-200	3	12	
			-160	-590	-20	-270	-670	-720	-640	-540	-534	-313	-540	-440	-449	-380	0	14	
				-430	140	-110	-510	-560	-480	-380	-374	-153	-380	-280	-289	-220	1	12	
					570	320	-80	-130	-50	50	56	277	50	150	141	210	9	3	
						-250	-650	-700	-620	-520	-514	-293	-520	-420	-429	-360	0	11	
							-400	-450	-370	-270	-264	-43	-270	-170	-179	-110	0	10	
								-50	30	130	136	357	130	230	221	290	8	1	
									80	180	186	407	180	280	271	340	8	0	
										100	106	327	100	200	191	260	7	0	
											6	227	0	100	91	160	5	0	
												221	-6	94	85	154	4	1	
													-227	-127	-136	-67	0	4	
														100	91	160	3	0	
															-9	60	1	1	
																69	1	0	
																	50	69	-19

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 19
p = 0.424
α = 0.1
No statistically significant 1,1-DCE concentration trend is indicated by the p value ($p>\alpha$).
Conclusion: No trend is present.



Monitoring Well MW-122A

DATE	Oct-99	Aug-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05					Positive Values	Negative Values	S
1,1-DCE (µg/L)	***100***	***25***	***1***	***10***	0.682	***10***	***1***							
		-75	-99	-90	-99.318	-90	-99					0	6	
			-24	-15	-24.318	-15	-24					0	5	
				9	-0.318	9	0					2	1	
					-9.318	0	-9					0	2	
						9.318	0.318					2	0	
							-9					0	1	
												4	15	-11

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 6
|S|= 11
p = *
α = 0.1

*Analyte was detected in only 1 of 6 the samples. Therefore, a Mann Kendall test is not necessary or appropriate.
Conclusion: No trend is discernible.

Notes:
100 Denotes detection limit value of a nondetect.

Monitoring Well C-1

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	9.5	26	89	60	34	68	46	18	22	310	210	265	189	320	176	102	490	411	279	123	75.5	173	90			
		16.5	79.5	50.5	24.5	58.5	36.5	8.5	12.5	300.5	200.5	255.5	179.5	310.5	166.5	92.5	480.5	401.5	269.5	113.5	66	163.5	80.5	22	0	
			63	34	8	42	20	-8	-4	284	184	239	163	294	150	76	464	385	253	97	49.5	147	64	19	2	
				-29	-55	-21	-43	-71	-67	221	121	176	100	231	87	13	401	322	190	34	-13.5	84	1	13	7	
					-26	8	-14	-42	-38	250	150	205	129	260	116	42	430	351	219	63	15.5	113	30	15	4	
						34	12	-16	-12	276	176	231	155	286	142	68	456	377	245	89	41.5	139	56	16	2	
							-22	-50	-46	242	142	197	121	252	108	34	422	343	211	55	7.5	105	22	14	3	
								-28	-24	264	164	219	143	274	130	56	444	365	233	77	29.5	127	44	14	2	
									4	292	192	247	171	302	158	84	472	393	261	105	57.5	155	72	15	0	
										288	188	243	167	298	154	80	468	389	257	101	53.5	151	68	14	0	
											-100	-45	-121	10	-134	-208	180	101	-31	-187	-234.5	-137	-220	3	10	
												55	-21	110	-34	-108	280	201	69	-87	-134.5	-37	-120	5	7	
													-76	55	-89	-163	225	146	14	-142	-189.5	-92	-175	4	7	
														131	-13	-87	301	222	90	-66	-113.5	-16	-99	4	6	
															-144	-218	170	91	-41	-197	-244.5	-147	-230	2	7	
																-74	314	235	103	-53	-100.5	-3	-86	3	5	
																	388	309	177	21	-26.5	71	-12	5	2	
																		-79	-211	-367	-414.5	-317	-400	0	6	
																			-132	-288	-335.5	-238	-321	0	5	
																				-156	-203.5	-106	-189	0	4	
																					-47.5	50	-33	1	2	
																						97.5	14.5	2	0	
																							-83	0	1	
																								130	80	50

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 23

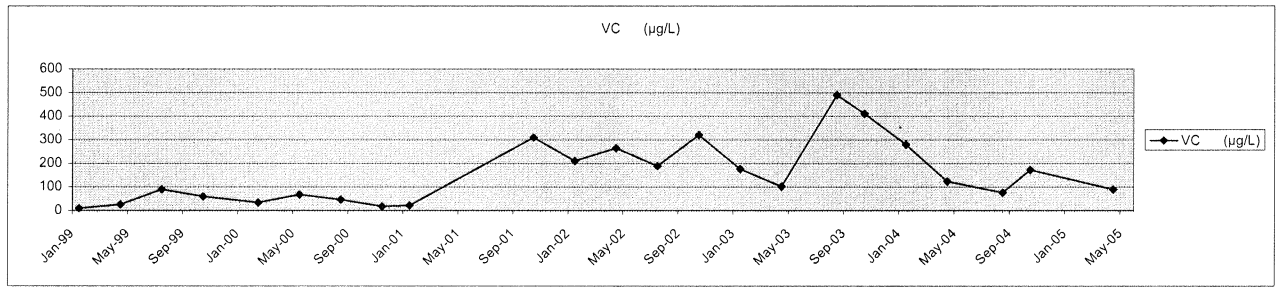
|S|= 50

p < 0.0005

α = 0.1

Results indicate an increasing VC concentration trend based on the p value ($p<\alpha$) and the (+) sign of the S value. Markedly higher VC concentrations are noted in the Aug-03 and Oct-03 samples from this well.

Conclusion: An increasing trend is present.



Monitoring Well C-2A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	86	220	330	110	380	180	82	94	190	200	174	241	170	77.4	68.4	187	6.4			
		134	244	24	294	94	-4	8	104	114	88	155	84	-8.6	-17.6	101	-79.6	12	4	
			110	-110	160	-40	-138	-126	-30	-20	-46	21	-50	-142.6	-151.6	-33	-213.6	3	12	
				-220	50	-150	-248	-236	-140	-130	-156	-89	-160	-252.6	-261.6	-143	-323.6	1	13	
					270	70	-28	-16	80	90	64	131	60	-32.6	-41.6	77	-103.6	8	5	
						-200	-298	-286	-190	-180	-206	-139	-210	-302.6	-311.6	-193	-373.6	0	12	
							-98	-86	10	20	-6	61	-10	-102.6	-111.6	7	-173.6	4	7	
								12	108	118	92	159	88	-4.6	-13.6	105	-75.6	7	3	
									96	106	80	147	76	-16.6	-25.6	93	-87.6	6	3	
										10	-16	51	-20	-112.6	-121.6	-3	-183.6	2	6	
											-26	41	-30	-122.6	-131.6	-13	-193.6	1	6	
												67	-4	-96.6	-105.6	13	-167.6	2	4	
													-71	-163.6	-172.6	-54	-234.6	0	5	
														-92.6	-101.6	17	-163.6	1	3	
															-9	109.6	-71	1	2	
																118.6	-62	1	1	
																	-180.6	0	1	
																		49	87	-38

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

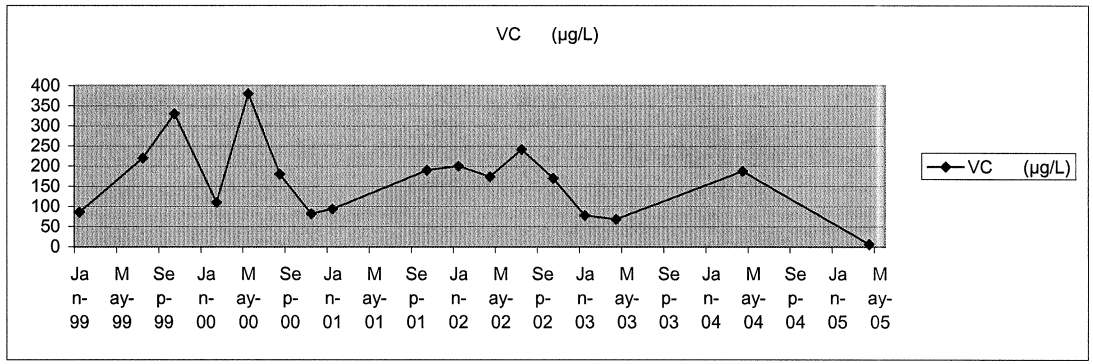
|S|= 38

p = 0.25

α = 0.1

No statistically significant VC concentration trend is indicated based on p level (p>α).

Conclusion: No statistical trend is present; however, the graphic illustration indicates a decreasing trend.



Monitoring Well C-3A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	85	51	110	32	180	410	270	360	520	190	130	28.7	36.8	5.3	7.48	112	103	439	121	340			
		-34	25	-53	95	325	185	275	435	105	45	-56.3	-48.2	-79.7	-77.52	27	18	354	36	255	13	6	
			59	-19	129	359	219	309	469	139	79	-22.3	-14.2	-45.7	-43.52	61	52	388	70	289	13	5	
				-78	70	300	160	250	410	80	20	-81.3	-73.2	-104.7	-102.52	2	-7	329	11	230	11	6	
					148	378	238	328	488	158	98	-3.3	4.8	-26.7	-24.52	80	71	407	89	308	13	3	
						230	90	180	340	10	-50	-151.3	-143.2	-174.7	-172.52	-68	-77	259	-59	160	7	8	
							-140	-50	110	-220	-280	-381.3	-373.2	-404.7	-402.52	-298	-307	29	-289	-70	2	12	
								90	250	-80	-140	-241.3	-233.2	-264.7	-262.52	-158	-167	169	-149	70	4	9	
									160	-170	-230	-331.3	-323.2	-354.7	-352.52	-248	-257	79	-239	-20	2	10	
										-330	-390	-491.3	-483.2	-514.7	-512.52	-408	-417	-81	-399	-180	0	11	
											-60	-161.3	-153.2	-184.7	-182.52	-78	-87	249	-69	150	2	8	
												-101.3	-93.2	-124.7	-122.52	-18	-27	309	-9	210	2	7	
													8.1	-23.4	-21.22	83.3	74.3	410.3	92.3	311.3	6	2	
														-31.5	-29.32	75.2	66.2	402.2	84.2	303.2	5	2	
															2.18	106.7	97.7	433.7	115.7	334.7	6	0	
																104.52	95.52	431.52	113.52	332.52	5	0	
																	-9	327	9	228	3	1	
																		336	18	237	3	0	
																			-318	-99	0	2	
																				219	1	0	
																					72	81	-9

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 19

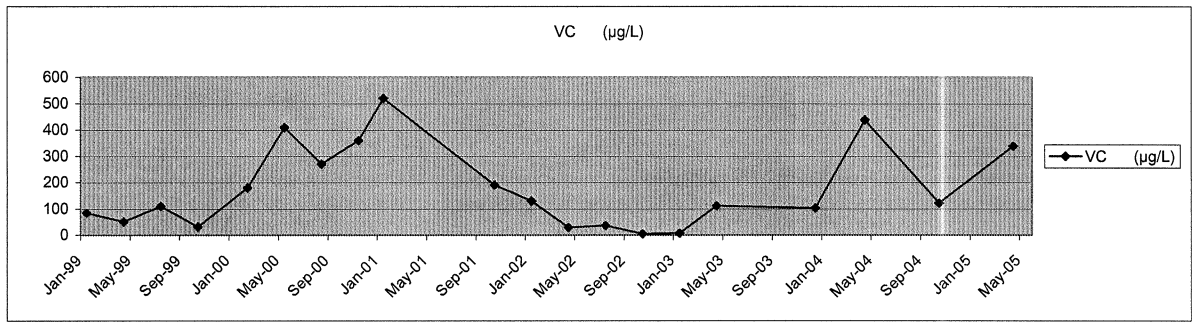
|S|= 9

p = 0.822

α = 0.1

No statistically significant increasing VC concentration trend is indicated based on the p value (p>α). Note that a statistically significant increasing trend from January 1999 through January 2001 (p=0.0126; S=24; n=9) is followed by a statistically decreasing trend (p<0.0002; S=-22; n=7)through January 2003. Once again there is a increasing trend from April-03.

Conclusion: No overall trend is present. Notable trends exist within subsets of the data.



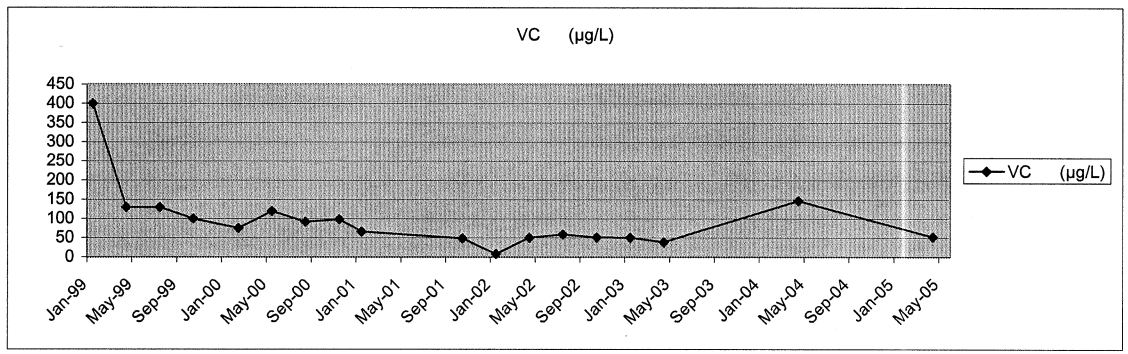
Monitoring Well C-4A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	***400***	130	130	100	75	120	92	98	66	48	8.6	50.3	58.2	51	49.9	38.1	147	52			
			0	-30	-55	-10	-38	-32	-64	-82	-121	-80	-72	-79	-80	-92	17	-78	1	14	
				-30	-55	-10	-38	-32	-64	-82	-121	-80	-72	-79	-80	-92	17	-78	1	14	
					-25	20	-8	-2	-34	-52	-91.4	-49.7	-41.8	-49	-50.1	-61.9	47	-48	2	12	
						45	17	23	-9	-27	-66.4	-24.7	-16.8	-24	-25.1	-36.9	72	-23	4	9	
							-28	-22	-54	-72	-111.4	-69.7	-61.8	-69	-70.1	-81.9	27	-68	1	11	
								6	-26	-44	-83.4	-41.7	-33.8	-41	-42.1	-53.9	55	-40	2	9	
									-32	-50	-89.4	-47.7	-39.8	-47	-48.1	-59.9	49	-46	1	9	
										-18	-57.4	-15.7	-7.8	-15	-16.1	-27.9	81	-14	1	8	
											-39.4	2.3	10.2	3	1.9	-9.9	99	4	6	2	
												41.7	49.6	42.4	41.3	29.5	138.4	43.4	7	0	
													8	1	0	-12	97	2	4	2	
														-7	-8	-20	89	-6	1	4	
															-1.1	-12.9	96	1	2	2	
																-11.8	97.1	2.1	2	1	
																	108.9	13.9	2	0	
																		-95	0	1	
																			37	98	-61

H_0= No concentration trend is present.
H_1= A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 61
$p < 0.001$
$\alpha = 0.1$

A statistically significant decreasing VC concentration trend is indicated based on the p value ($p<\alpha$) and (-) sign of the S value. The high January 1999 detection limit value is excluded because it is elevated relative to the other sample results.
Conclusion: Decreasing trend is present.

Notes:
400 Denotes detection limit value of a nondetect.



Monitoring Well C-5A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	*10*	65	62	99	250	210	260	290	290	200	360	97.5	190	83	64.2	216	7.58	48.2	19.2	79			
		55	52	89	240	200	250	280	280	190	350	87.5	180	73	54.2	206	-2.42	38.2	9.2	69	18	1	
			-3	34	185	145	195	225	225	135	295	32.5	125	18	-0.8	151	-57.42	-16.8	-45.8	14	13	5	
				37	188	148	198	228	228	138	298	35.5	128	21	2.2	154	-54.42	-13.8	-42.8	17	14	3	
					151	111	161	191	191	101	261	-1.5	91	-16	-34.8	117	-91.42	-50.8	-79.8	-20	9	7	
						-40	10	40	40	-50	110	-152.5	-60	-167	-185.8	-34	-242.42	-201.8	-230.8	-171	4	11	
							50	80	80	-10	150	-112.5	-20	-127	-145.8	6	-202.42	-161.8	-190.8	-131	5	9	
								30	30	-60	100	-162.5	-70	-177	-195.8	-44	-252.42	-211.8	-240.8	-181	3	10	
									0	-90	70	-192.5	-100	-207	-225.8	-74	-282.42	-241.8	-270.8	-211	1	10	
										-90	70	-192.5	-100	-207	-225.8	-74	-282.42	-241.8	-270.8	-211	1	10	
											160	-102.5	-10	-117	-135.8	16	-192.42	-151.8	-180.8	-121	2	8	
												-262.5	-170	-277	-295.8	-144	-352.42	-311.8	-340.8	-281	0	9	
													92.5	-14.5	-33.3	118.5	-89.92	-49.3	-78.3	-18.5	2	6	
														-107	-125.8	26	-182.42	-141.8	-170.8	-111	1	6	
															-18.8	133	-75.42	-34.8	-63.8	-4	1	5	
																151.8	-56.62	-16	-45	14.8	2	3	
																	-208.42	-167.8	-196.8	-137	0	4	
																		40.62	11.62	71.42	3	0	
																			-29	30.8	1	1	
																				59.8	1	0	
																					50	102	-52

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 20

|S|= 52

p = < 0.0005

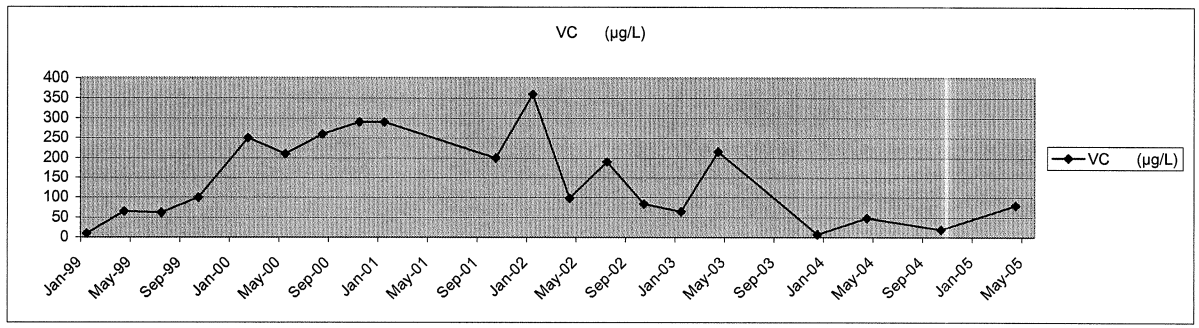
α = 0.1

A statistically significant decreasing VC concentration trend is indicated based on the p value (p>α) and sign (-) of the S value. Note that a statistically significant increasing trend from April 1999 through January 2001 (p=0.00055; S=31; n=9) is followed by a statistically decreasing trend (p=0.03; S=-15; n=7) through January 2003.

Conclusion: Decreasing trend is present.

Notes:

10 Denotes detection limit value of a nondetect.



Monitoring Well C-5B

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	100	150	62	100	99	160	110	130	160	100	38	32.9	16.9	33	31.2	88	187	140			
		50	-38	0	-1	60	10	30	60	0	-62	-67.1	-83.1	-67	-68.8	-12	87	40	7	8	
			-88	-50	-51	10	-40	-20	10	-50	-112	-117.1	-133.1	-117	-118.8	-62	37	-10	3	13	
				38	37	98	48	68	98	38	-24	-29.1	-45.1	-29	-30.8	26	125	78	10	5	
					-1	60	10	30	60	0	-62	-67.1	-83.1	-67	-68.8	-12	87	40	6	7	
						61	11	31	61	1	-61	-66.1	-82.1	-66	-67.8	-11	88	41	7	6	
							-50	-30	0	-60	-122	-127.1	-143.1	-127	-128.8	-72	27	-20	1	10	
								20	50	-10	-72	-77.1	-93.1	-77	-78.8	-22	77	30	4	7	
									30	-30	-92	-97.1	-113.1	-97	-98.8	-42	57	10	3	7	
										-60	-122	-127.1	-143.1	-127	-128.8	-72	27	-20	1	8	
											-62	-67.1	-83.1	-67	-68.8	-12	87	40	2	6	
												-5.1	-21.1	-5	-6.8	50	149	102	3	4	
													-16	0.1	-1.7	55.1	154.1	107.1	4	2	
														16.1	14.3	71.1	170.1	123.1	5	0	
															-1.8	55	154	107	3	1	
																56.8	155.8	108.8	3	0	
																	99	52	2	0	
																		-47	0	1	
																			64	85	-21

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 18

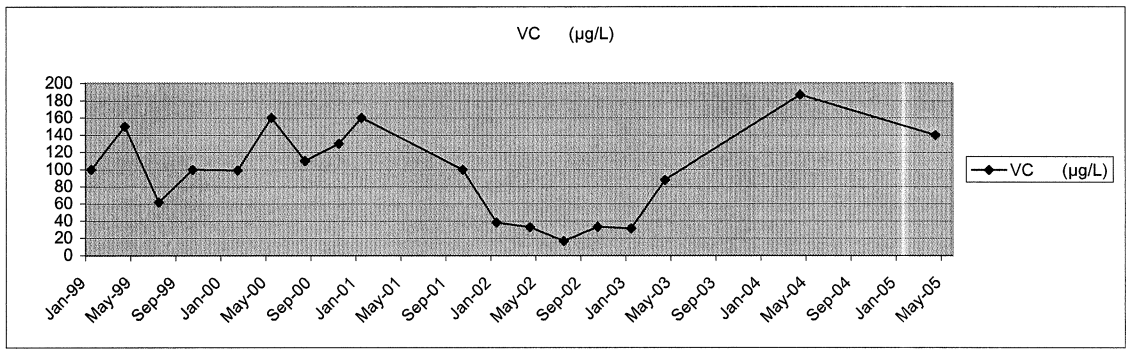
|S|= 21

p = 0.236

α = 0.1

Results indicate a statistically significant decreasing VC concentration trend based on the p value ($p<\alpha$) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well C-5C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	*1*	2.3	4.3	6	5	4.4	2.4	2	*1*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	0.634	*1*			
		1.3	3.3	5	4	3.4	1.4	1	0	1	1	1	1	1	1	1	-0.366	0	14	1	
			2	3.7	2.7	2.1	0.1	-0.3	-1.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-1.666	-1.3	5	11	
				1.7	0.7	0.1	-1.9	-2.3	-3.3	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	-2.3	-3.666	-3.3	3	12	
					-1	-1.6	-3.6	-4	-5	-4	-4	-4	-4	-4	-4	-4	-5.366	-5	0	14	
						-0.6	-2.6	-3	-4	-3	-3	-3	-3	-3	-3	-3	-4.366	-4	0	13	
							-2	-2.4	-3.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-3.766	-3.4	0	12	
								-0.4	-1.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-1.766	-1.4	0	11	
									-1	0	0	0	0	0	0	0	-1.366	-1	0	3	
										1	1	1	1	1	1	1	-0.366	0	7	1	
											0	0	0	0	0	0	-1.366	-1	0	2	
												0	0	0	0	0	-1.366	-1	0	2	
													0	0	0	0	-1.366	-1	0	2	
														0	0	0	-1.366	-1	0	2	
															0	0	-1.366	-1	0	2	
																0	-1.366	-1	0	2	
																	-1.366	-1	0	2	
																		0.366	1	0	
																			30	92	-62

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 18

|S|= 62

p = 0.058

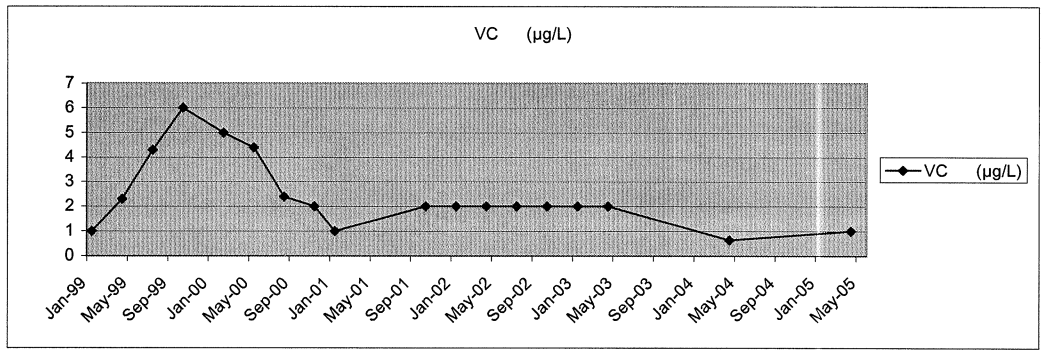
α = 0.1

Results indicate a decreasing VC concentration trend based on the p value ($p<\alpha$) and (-) sign of the S value. However, more than 1/2 of samples are nondetects, casting doubt on the p value. Also, if the detection limits are used for nondetects instead of 0.5X the detection limits, the Mann Kendall results indicate no trend (p=0.126; S=-29; n=15). Note that since January 2000, all samples have been nondetects.

Conclusion: Decreasing trend is inferred qualitatively; Mann Kendall results are inconclusive.

Notes:

1 Denotes 0.5X detection limit value of a nondetect.



Monitoring Well C-7A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	130	92	110	88	74	53	91	54	85	46	15.4	10.5	5	2.96	0.739	117	17.4	1.37	*1*			
		-38	-20	-42	-56	-77	-39	-76	-45	-84	-114.6	-119.5	-125	-127.04	-129.261	-13	-112.6	-128.63	-129	0	18	
			18	-4	-18	-39	-1	-38	-7	-46	-76.6	-81.5	-87	-89.04	-91.261	25	-74.6	-90.63	-91	2	15	
				-22	-36	-57	-19	-56	-25	-64	-94.6	-99.5	-105	-107.04	-109.261	7	-92.6	-108.63	-109	1	15	
					-14	-35	3	-34	-3	-42	-72.6	-77.5	-83	-85.04	-87.261	29	-70.6	-86.63	-87	2	13	
						-21	17	-20	11	-28	-58.6	-63.5	-69	-71.04	-73.261	43	-56.6	-72.63	-73	3	11	
							38	1	32	-7	-37.6	-42.5	-48	-50.04	-52.261	64	-35.6	-51.63	-52	4	9	
								-37	-6	-45	-75.6	-80.5	-86	-88.04	-90.261	26	-73.6	-89.63	-90	1	11	
									31	-8	-38.6	-43.5	-49	-51.04	-53.261	63	-36.6	-52.63	-53	2	9	
										-39	-69.6	-74.5	-80	-82.04	-84.261	32	-67.6	-83.63	-84	1	9	
											-30.6	-35.5	-41	-43.04	-45.261	71	-28.6	-44.63	-45	1	8	
												-4.9	-10.4	-12.44	-14.661	101.6	2	-14.03	-14.4	2	6	
													-5.5	-7.54	-9.761	106.5	6.9	-9.13	-9.5	2	5	
														-2.04	-4.261	112	12.4	-3.63	-4	2	4	
															-2.221	114.04	14.44	-1.59	-1.96	2	3	
																116.261	16.661	0.631	0.261	4	0	
																	-99.6	-115.63	-116	0	3	
																		-16.03	-16.4	0	2	
																			-0.37	0	1	
																				27	109	-82

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 19

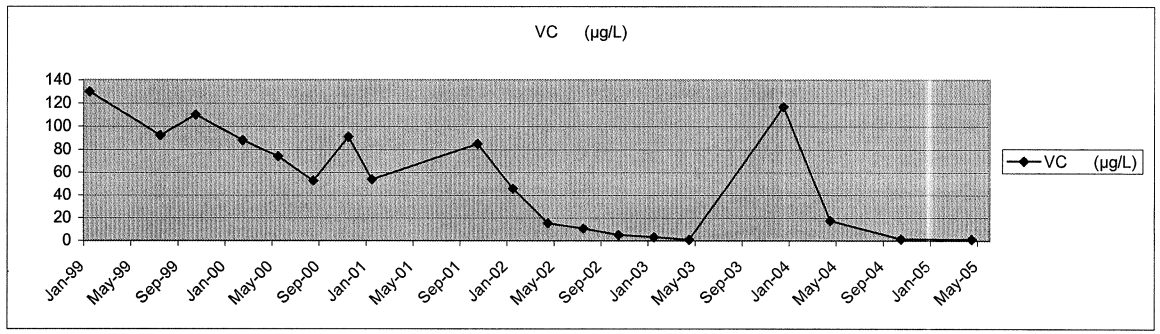
|S|= 82

p = < 0.0005

α = 0.1

A statistically significant decreasing VC concentration trend is indicated based on the p value (p<α) and (-) sign of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-8A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	***500***	31	19	5.5	8.1	6.6	4.6	15	21	13	41	3.64	40	50.6	29.2	26.2	16			
		-469	-481	-494.5	-491.9	-493.4	-495.4	-485	-479	-487	-459	-496.36	-460	-449.4	-470.8	-473.8	-484	0	16	
			-12	-25.5	-22.9	-24.4	-26.4	-16	-10	-18	10	-27.36	9	19.6	-1.8	-4.8	-15	3	12	
				-13.5	-10.9	-12.4	-14.4	-4	2	-6	22	-15.36	21	31.6	10.2	7.2	-3	6	8	
					2.6	1.1	-0.9	9.5	15.5	7.5	35.5	-1.86	34.5	45.1	23.7	20.7	10.5	11	2	
						-1.5	-3.5	6.9	12.9	4.9	32.9	-4.46	31.9	42.5	21.1	18.1	7.9	9	3	
							-2	8.4	14.4	6.4	34.4	-2.96	33.4	44	22.6	19.6	9.4	9	2	
								10.4	16.4	8.4	36.4	-0.96	35.4	46	24.6	21.6	11.4	9	1	
									6	-2	26	-11.36	25	35.6	14.2	11.2	1	7	2	
										-8	20	-17.36	19	29.6	8.2	5.2	-5	5	3	
											28	-9.36	27	37.6	16.2	13.2	3	6	1	
												-37.36	-1	9.6	-11.8	-14.8	-25	1	5	
													36.36	46.96	25.56	22.56	12.36	5	0	
														10.6	-10.8	-13.8	-24	1	3	
															-21.4	-24.4	-34.6	0	3	
																-3	-13.2	0	2	
																	-10.2	0	1	
																		72	64	8

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

|S|= 8

p = 0.69

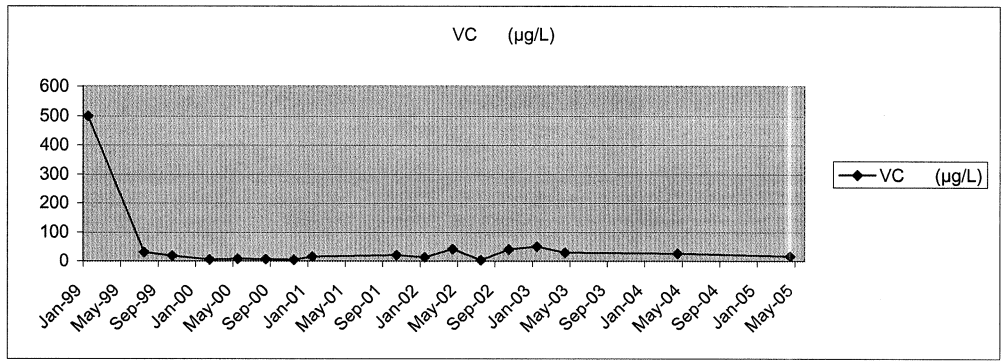
α = 0.1

No statistically significant decreasing VC concentration trend is indicated ($p>\alpha$).

Conclusion: No trend is present.

Notes:

500 Denotes detection limit value of a nondetect.



Monitoring Well C-9A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	41	44	34	15	4.7	8	*1*	4.9	8.6	5.7	4.7	4.29	8.65	25	23.5	23.8	6.12	11.2	2.49	3			
		3	-7	-26	-36.3	-33	-40	-36.1	-32.4	-35.3	-36.3	-36.71	-32.35	-16	-17.5	-17.2	-34.88	-29.8	-38.51	-38	1	18	
			-10	-29	-39.3	-36	-43	-39.1	-35.4	-38.3	-39.3	-39.71	-35.35	-19	-20.5	-20.2	-37.88	-32.8	-41.51	-41	0	18	
				-19	-29.3	-26	-33	-29.1	-25.4	-28.3	-29.3	-29.71	-25.35	-9	-10.5	-10.2	-27.88	-22.8	-31.51	-31	0	17	
					-10.3	-7	-14	-10.1	-6.4	-9.3	-10.3	-10.71	-6.35	10	8.5	8.8	-8.88	-3.8	-12.51	-12	3	13	
						3.3	-3.7	0.2	3.9	1	0	-0.41	3.95	20.3	18.8	19.1	1.42	6.5	-2.21	-1.7	10	4	
							-7	-3.1	0.6	-2.3	-3.3	-3.71	0.65	17	15.5	15.8	-1.88	3.2	-5.51	-5	6	8	
								3.9	7.6	4.7	3.7	3.29	7.65	24	22.5	22.8	5.12	10.2	1.49	2	13	0	
									3.7	0.8	-0.2	-0.61	3.75	20.1	18.6	18.9	1.22	6.3	-2.41	-1.9	8	4	
										-2.9	-3.9	-4.31	0.05	16.4	14.9	15.2	-2.48	2.6	-6.11	-5.6	5	6	
											-1	-1.41	2.95	19.3	17.8	18.1	0.42	5.5	-3.21	-2.7	6	4	
												-0.41	3.95	20.3	18.8	19.1	1.42	6.5	-2.21	-1.7	6	3	
													4.36	20.71	19.21	19.51	1.83	6.91	-1.8	-1.29	6	2	
														16.35	14.85	15.15	-2.53	2.55	-6.16	-5.65	4	3	
															-1.5	-1.2	-18.88	-13.8	-22.51	-22	0	6	
																0.3	-17.38	-12.3	-21.01	-20.5	1	4	
																	-17.68	-12.6	-21.31	-20.8	0	4	
																		5.08	-3.63	-3.12	1	2	
																			-8.71	-8.2	0	2	
																				0.51	1	0	
																					70	82	-12

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 20

|S|= 12

p = 0.0006

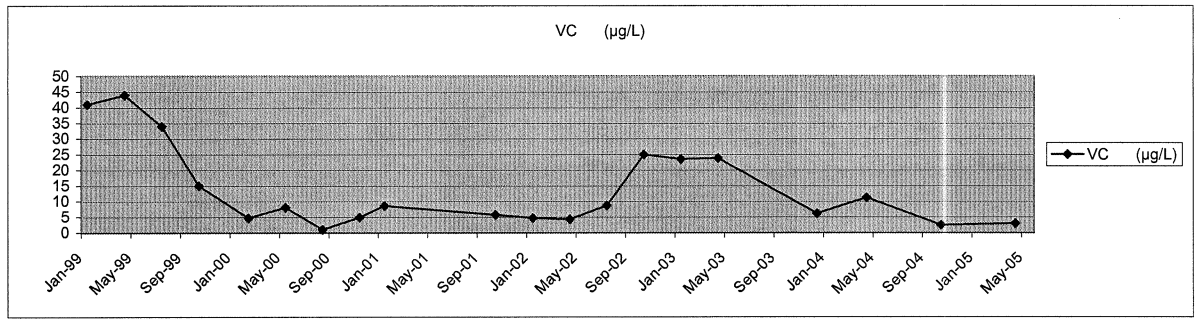
α = 0.1

A statistically significant decreasing VC concentration trend is indicated based on the p value (p>α) and sign (-) of the S value.

Conclusion: Decreasing trend is present.

Notes:

1 Denotes detection limit value of a nondetect.

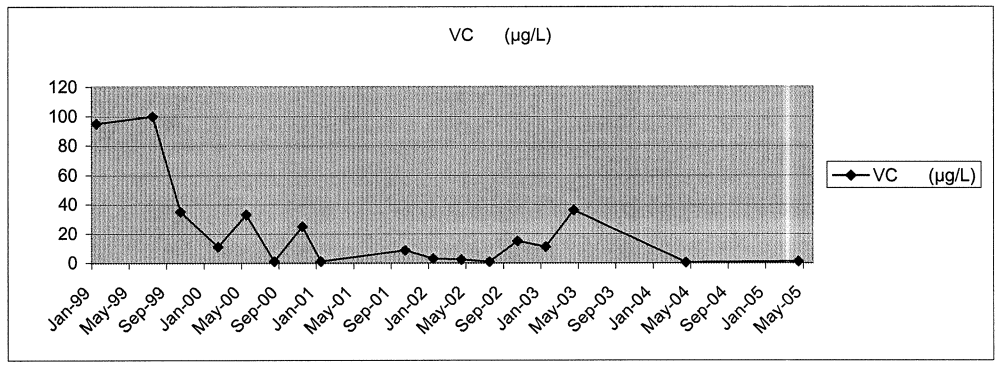


Monitoring Well C-9B

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	95	100	35	11	33	*1*	25	*1*	8.7	3.1	2.34	0.801	15	11	36	0.338	*1*			
		5	-60	-84	-62	-94	-70	-94	-86.3	-91.9	-92.66	-94.199	-80	-84	-59	-94.662	-94	1	15	
			-65	-89	-67	-99	-75	-99	-91.3	-96.9	-97.66	-99.199	-85	-89	-64	-99.662	-99	0	15	
				-24	-2	-34	-10	-34	-26.3	-31.9	-32.66	-34.199	-20	-24	1	-34.662	-34	1	13	
					22	-10	14	-10	-2.3	-7.9	-8.66	-10.199	4	0	25	-10.662	-10	4	8	
						-32	-8	-32	-24.3	-29.9	-30.66	-32.199	-18	-22	3	-32.662	-32	1	11	
							24	0	7.7	2.1	1.34	-0.199	14	10	35	-0.662	0	7	2	
								-24	-16.3	-21.9	-22.66	-24.199	-10	-14	11	-24.662	-24	1	9	
									7.7	2.1	1.34	-0.199	14	10	35	-0.662	0	6	2	
										-5.6	-6.36	-7.899	6.3	2.3	27.3	-8.362	-7.7	3	5	
											-0.76	-2.299	11.9	7.9	32.9	-2.762	-2.1	3	4	
												-1.539	12.66	8.66	33.66	-2.002	-1.34	3	3	
													14.199	10.199	35.199	-0.463	0.199	4	1	
														-4	21	-14.662	-14	1	3	
															25	-10.662	-10	1	2	
																-35.662	-35	0	2	
																	0.662	1	0	
																		37	95	-58

H_0= No concentration trend is present.
H_1= A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 58
p = 0.032
α = 0.1
A statistically significant decreasing VC concentration trend is indicated based on the p value ($p<\alpha$) and (-) sign of the S value.
Conclusion: Decreasing trend is present.

Notes:
1 Denotes detection limit value of a nondetect.



Monitoring Well C-9C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	4.3	1.9	1.7	2.4	*1*	0.55	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	0.82	*2*	*1*			
		-2.4	-2.6	-1.9	-3.3	-3.75	-3.3	-3.3	-3.3	-3.3	-3.3	-3.3	-3.3	-3.3	-3.3	-3.48	-2.3	-3.3	0	17	
			-0.2	0.5	-0.9	-1.35	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-0.9	-1.08	0.1	-0.9	2	14	
				0.7	-0.7	-1.15	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.88	0.3	-0.7	2	13	
					-1.4	-1.85	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.58	-0.4	-1.4	0	14	
						-0.45	0	0	0	0	0	0	0	0	0	-0.18	1	0	1	2	
							0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.27	1.45	0.45	12	0	
								0	0	0	0	0	0	0	0	-0.18	1	0	1	1	
									0	0	0	0	0	0	0	-0.18	1	0	1	1	
										0	0	0	0	0	0	-0.18	1	0	1	1	
											0	0	0	0	0	-0.18	1	0	1	1	
												0	0	0	0	-0.18	1	0	1	1	
													0	0	0	-0.18	1	0	1	1	
														0	0	-0.18	1	0	1	1	
															0	-0.18	1	0	1	1	
																-0.18	1	0	1	1	
																	1.18	0.18	2	0	
																		-1	0	1	
																			28	70	-42

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 13

|S|= 42

p = 0.25

α = 0.1

No statistically significant VC concentration trend is indicated based on the p value ($p>\alpha$). However, most samples are nondetect, and the last detection was in April 2003.

Conclusion: A majority of samples are nondetects. A decreasing trend is qualitatively inferred.

Notes:

1 Denotes 0.5X detection limit value of a nondetect.

Monitoring Well C-10

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	1.3	*1*	0.93	1.3	1.7	1	*1*	0.85	8.6	69	40	13.3	*2*	1.2	0.381	0.262	*2*	3.5	9.11	*1*			
		-0.3	-0.37	0	0.4	-0.3	-0.3	-0.45	7.3	67.7	38.7	12	0.7	-0.1	-0.919	-1.038	0.7	2.2	7.81	-0.3	9	9	
			-0.07	0.3	0.7	0	0	-0.15	7.6	68	39	12.3	1	0.2	-0.619	-0.738	1	2.5	8.11	0	11	4	
				0.37	0.77	0.07	0.07	-0.08	7.67	68.07	39.07	12.37	1.07	0.27	-0.549	-0.668	1.07	2.57	8.18	0.07	14	3	
					0.4	-0.3	-0.3	-0.45	7.3	67.7	38.7	12	0.7	-0.1	-0.919	-1.038	0.7	2.2	7.81	-0.3	9	7	
						-0.7	-0.7	-0.85	6.9	67.3	38.3	11.6	0.3	-0.5	-1.319	-1.438	0.3	1.8	7.41	-0.7	8	7	
							0	-0.15	7.6	68	39	12.3	1	0.2	-0.619	-0.738	1	2.5	8.11	0	9	3	
								-0.15	7.6	68	39	12.3	1	0.2	-0.619	-0.738	1	2.5	8.11	0	9	3	
									7.75	68.15	39.15	12.45	1.15	0.35	-0.469	-0.588	1.15	2.65	8.26	0.15	10	2	
										60.4	31.4	4.7	-6.6	-7.4	-8.219	-8.338	-6.6	-5.1	0.51	-7.6	4	7	
											-29	-55.7	-67	-67.8	-68.619	-68.738	-67	-65.5	-59.89	-68	0	10	
												-26.7	-38	-38.8	-39.619	-39.738	-38	-36.5	-30.89	-39	0	9	
													-11.3	-12.1	-12.919	-13.038	-11.3	-9.8	-4.19	-12.3	0	8	
														-0.8	-1.619	-1.738	0	1.5	7.11	-1	2	4	
															-0.819	-0.938	0.8	2.3	7.91	-0.2	3	3	
																-0.119	1.619	3.119	8.729	0.619	4	1	
																	1.738	3.238	8.848	0.738	4	0	
																		1.5	7.11	-1	2	1	
																			5.61	-2.5	1	1	
																				-8.11	0	1	
																					79	70	9

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 20

|S|= 9

p = 0.0168

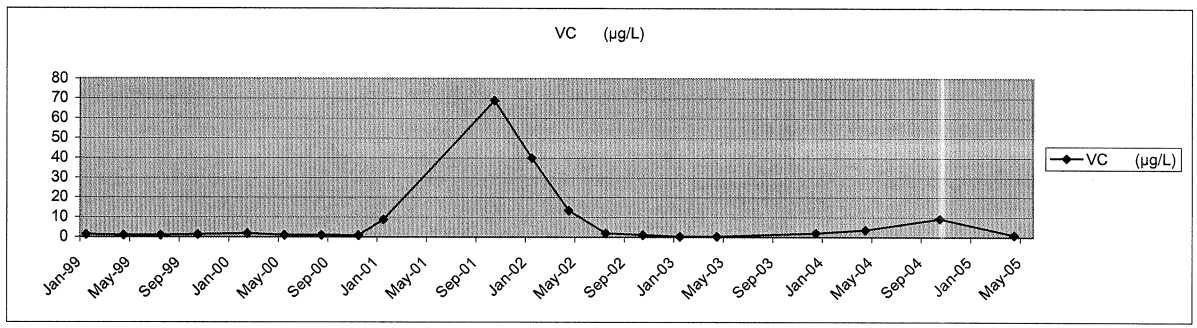
α = 0.1

Results indicate decreasing VC concentration trend based on the p value ($p>\alpha$) and sign (-) of the S value. It is noted that the highest concentrations were detected from January 2001 through April 2002.

Conclusion: Decreasing trend is present.

Notes:

1 Denotes detection limit value of a nondetect.



Monitoring Well C-11

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	20	*1*	8.3	7	8.8	6.2	6.64	5.36	4.7	4.73	6.03	15.5	11.1	7.54	2.8			
		-19	-11.7	-13	-11.2	-13.8	-13.36	-14.64	-15.3	-15.27	-13.97	-4.5	-8.9	-12.46	-17.2	0	14	
			7.3	6	7.8	5.2	5.64	4.36	3.7	3.73	5.03	14.5	10.1	6.54	1.8	13	0	
				-1.3	0.5	-2.1	-1.66	-2.94	-3.6	-3.57	-2.27	7.2	2.8	-0.76	-5.5	3	9	
					1.8	-0.8	-0.36	-1.64	-2.3	-2.27	-0.97	8.5	4.1	0.54	-4.2	4	7	
						-2.6	-2.16	-3.44	-4.1	-4.07	-2.77	6.7	2.3	-1.26	-6	2	8	
							0.44	-0.84	-1.5	-1.47	-0.17	9.3	4.9	1.34	-3.84	4	5	
								-1.28	-1.94	-1.91	-0.61	8.86	4.46	0.9	-2.56	3	5	
									-0.66	-0.63	0.67	10.14	5.74	2.18	-1.9	4	3	
										0.03	1.33	10.8	6.4	2.84	-1.93	5	1	
											1.3	10.77	6.37	2.81	-3.23	4	1	
												9.47	5.07	1.51	-13.14	3	1	
													-4.4	-7.96	-7.02	0	3	
														-3.56	-7.64	0	2	
															-4.77	0	1	
																32	46	-14

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 15

|S|= 14

p = < 0.0005

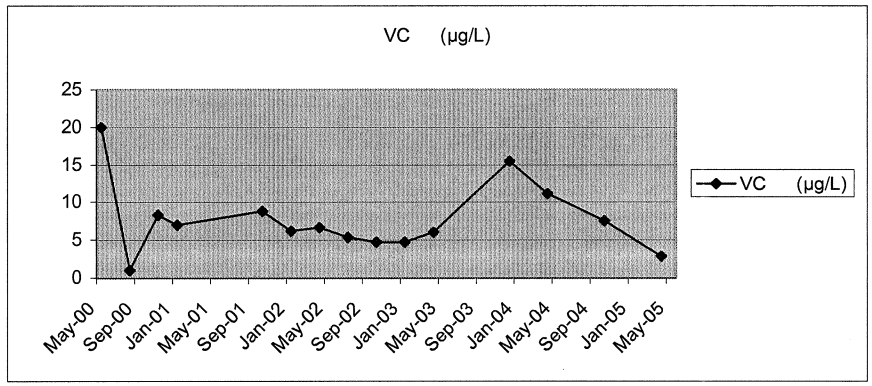
α = 0.1

A statistically significant decreasing VC concentration trend is indicated based on the p value ($p>\alpha$) and sign (-) of the S value.

Conclusion: Decreasing trend is present.

Notes:

1 Denotes detection limit value of a nondetect.



Monitoring Well C-12

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	18	19	17	13	9.4	8.6	8.16	1.28	**2**	0.428	0.884	1.98	2.4	4.69	1.5			
		1	-1	-5	-8.6	-9.4	-9.84	-16.72	-16	-17.572	-17.116	-16.02	-15.6	-13.31	-16.5	1	13	
			-2	-6	-9.6	-10.4	-10.84	-17.72	-17	-18.572	-18.116	-17.02	-16.6	-14.31	-17.5	0	13	
				-4	-7.6	-8.4	-8.84	-15.72	-15	-16.572	-16.116	-15.02	-14.6	-12.31	-15.5	0	12	
					-3.6	-4.4	-4.84	-11.72	-11	-12.572	-12.116	-11.02	-10.6	-8.31	-11.5	0	11	
						-0.8	-1.24	-8.12	-7.4	-8.972	-8.516	-7.42	1.12	-4.71	-7.9	1	9	
							-0.44	-7.32	-6.6	-8.172	-7.716	-6.62	0.4	-3.91	-7.1	1	8	
								-6.88	-6.16	-7.732	-7.276	-6.18	1.972	-3.47	-17.5	1	7	
									0.72	-0.852	-0.396	0.7	1.516	3.41	0.22	5	2	
										-1.572	-1.116	-0.02	0.42	2.69	-0.5	2	4	
											0.456	1.552	10.092	4.262	1.072	5	0	
												1.096	8.116	3.806	0.616	4	0	
													8.152	2.71	-11.32	2	1	
														1.894	-1.296	1	1	
															-3.19	0	1	
																22	56	-34

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 15

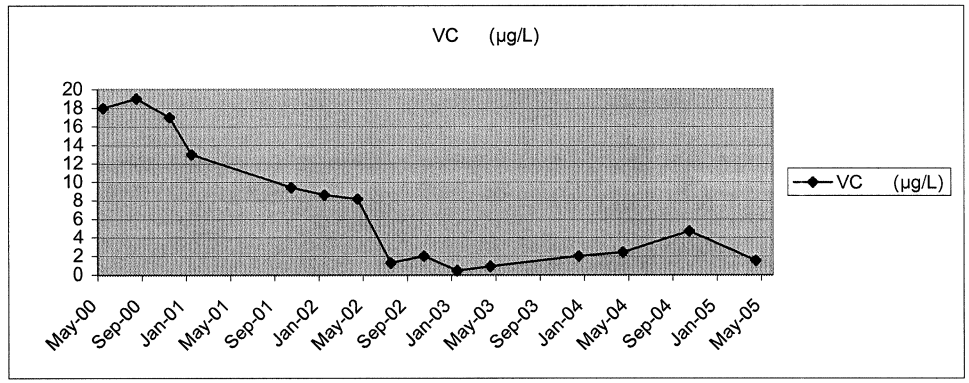
|S|= 34

p = < 0.0005

α = 0.1

Results indicate a statistically significant decreasing VC concentration trend based on the p value ($p<\alpha$) and the (-) sign of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-13

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	***20***	4.4	***1***	***1***	***2***	***2***	***2***	***2***	***2***	***2***	***2***	***2***	***2***	***2***	***10***			
		-15.6	-19	-19	-18	-18	-18	-18	-18	-18	-18	-18	-18	-18	-10	0	14	
			-3.4	-3.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	-2.4	5.6	1	12	
				0	1	1	1	1	1	1	1	1	1	1	9	11	0	
					1	1	1	1	1	1	1	1	1	1	9	11	0	
						0	0	0	0	0	0	0	0	0	8	1	0	
							0	0	0	0	0	0	0	0	8	1	0	
								0	0	0	0	0	0	0	8	1	0	
									0	0	0	0	0	0	8	1	0	
										0	0	0	0	0	8	1	0	
											0	0	0	0	8	1	0	
												0	0	0	8	1	0	
													0	0	8	1	0	
														0	8	1	0	
															8	1	0	
																32	0	32

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 15

|S|= *

p = *

α = 0.1

*No statistically significant VC concentration trend is indicated because VC was detected in only one sample; a statistical evaluation is not applicable.

Conclusion: Mann-Kendall test is necessary nor appropriate; majority of the samples are nondetects.

Notes:

20 Denotes detection limit value of a nondetect.

Monitoring Well C-14

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	28	44	23	13	12	12	13.1	42.2	1.1	4.35	2.19	20	5.98	7.77	2.3			
		16	-5	-15	-16	-16	-14.9	14.2	-26.9	-23.65	-25.81	-8	-22.02	-20.23	-25.7	2	12	
			-21	-31	-32	-32	-30.9	-1.8	-42.9	-39.65	-41.81	-24	-38.02	-36.23	-41.7	0	13	
				-10	-11	-11	-9.9	19.2	-21.9	-18.65	-20.81	-3	-17.02	-15.23	-20.7	1	11	
					-1	-1	0.1	29.2	-11.9	-8.65	-10.81	7	-7.02	-5.23	-10.7	3	8	
						0	1.1	30.2	-10.9	-7.65	-9.81	8	-6.02	-4.23	-9.7	3	6	
							1.1	30.2	-10.9	-7.65	-9.81	8	-6.02	-4.23	-9.7	3	6	
								29.1	-12	-8.75	-10.91	6.9	-7.12	-5.33	-10.8	2	6	
									-41.1	-37.85	-40.01	-22.2	-36.22	-34.43	-39.9	0	7	
										3.25	1.09	18.9	4.88	6.67	1.2	6	0	
											-2.16	15.65	1.63	3.42	-2.05	3	2	
												17.81	3.79	5.58	0.11	4	0	
													-14.02	-12.23	-17.7	0	3	
														1.79	-3.68	1	1	
															-5.47	0	1	
																26	51	-25

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 15

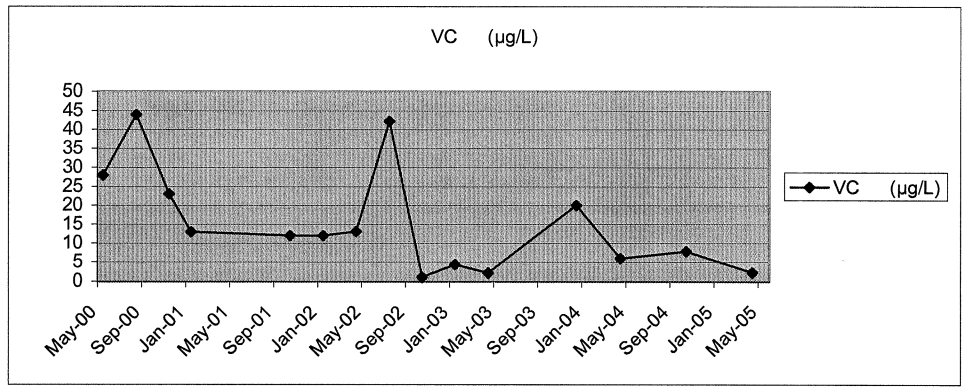
|S|= 25

p = < 0.0005

α = 0.1

Results indicate a statistically significant decreasing VC concentration trend based on the p value ($p<\alpha$) and (-) sign of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-15

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	May-05					Positive Values	Negative Values	S
VC (µg/L)	231	416	413	285	262	208	180							
		185	182	54	31	-23	-51					4	2	
			-3	-131	-154	-208	-236					0	5	
				-128	-151	-205	-233					0	4	
					-23	-77	-105					0	3	
						-54	-82					0	2	
							-28					0	1	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												4	17	-13

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 5

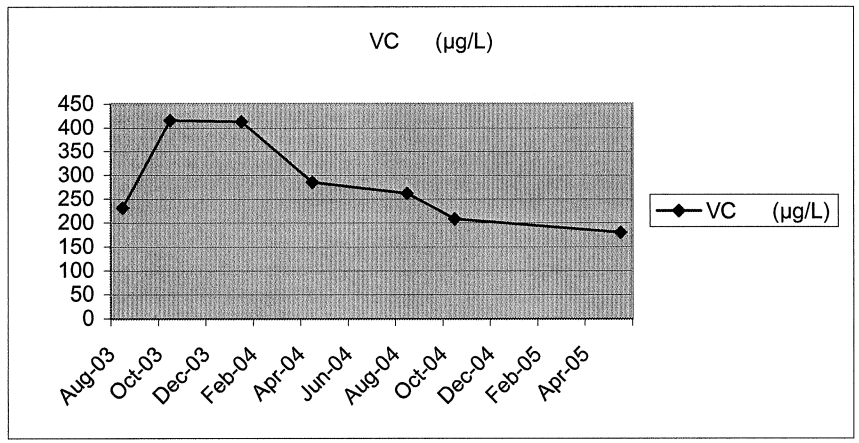
|S|= 13

p = < 0.0005

α = 0.1

A statistically significant decreasing VC concentration trend is indicated based on p level ($p>\alpha$) and sign (-) of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-16

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
VC (µg/L)	160	117	191	68.7	107	53.6	9.6							
		-43	31	-91.3	-53	-106.4	-150.4					1	5	
			74	-48.3	-10	-63.4	-107.4					1	4	
				-122.3	-84	-137.4	-181.4					0	4	
					38.3	-15.1	-59.1					1	2	
						-53.4	-97.4					0	2	
							-44					0	1	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												3	18	-15

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 5

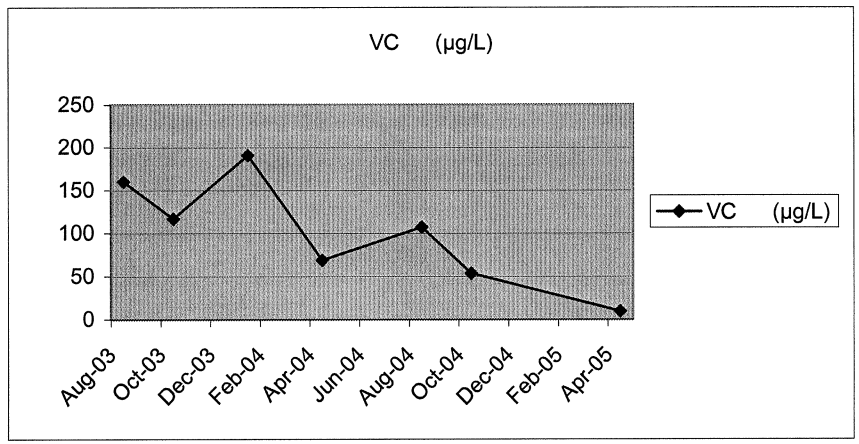
|S|= 15

p = < 0.0005

α = 0.1

A statistically significant decreasing cis 1,2-DCE concentration trend is indicated based on the p level ($p>\alpha$) and sign (-) of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-17

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
VC (µg/L)	142	73.1	76.1	63.1	143	129	160							
		-68.9	-65.9	-78.9	1	-13	18					2	4	
			3	-10	69.9	55.9	86.9					4	1	
				-13	66.9	52.9	83.9					3	1	
					79.9	65.9	96.9					3	0	
						-14	17					1	1	
							31					1	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												14	7	7

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

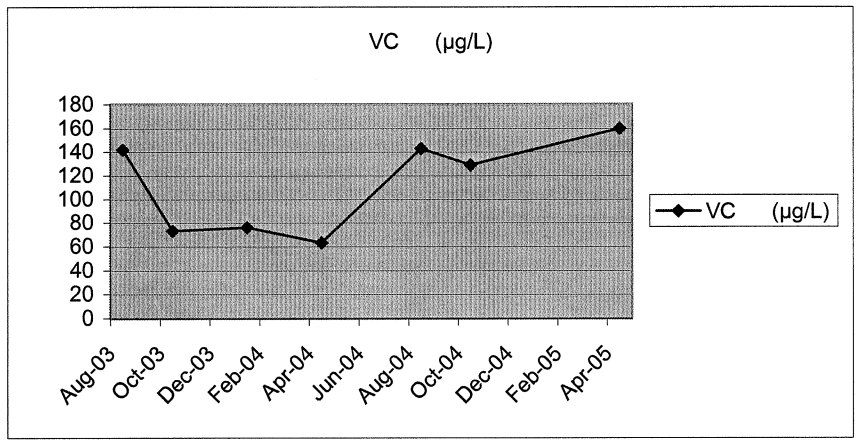
|S|= 7

p = 0.0003

α = 0.1

Results indicate a statistically significant increasing VC concentration trend based on the p value ($p<\alpha$) and (+) sign of the S value.

Conclusion: Increasing trend is present.



Monitoring Well C-18

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
VC (µg/L)	22.4	0.992	*2*	*2*	*2*	*2*	*1*							
		-21.408	-20.4	-20.4	-20.4	-20.4	-21.4					0	6	
			1.008	1.008	1.008	1.008	0.008					5	0	
				0	0	0	-1					0	1	
					0	0	-1					0	1	
						0	-1					0	1	
							-1					0	1	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												5	10	-5

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

|S|= 5

p = *

α = 0.1

* No statistically significant VC concentration trend is indicated. Because VC was only detected in 2 of the 7 sampling rounds, it casts uncertainty to the p value.

Conclusion: No trend is present.

Monitoring Well C-19

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
VC (µg/L)	*2*	*2*	*2*	*2*	*2*	*2*	*2*							
		0	0	0	0	0	0					0	0	
			0	0	0	0	0					0	0	
				0	0	0	0					0	0	
					0	0	0					0	0	
						0	0					0	0	
							0					0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	0

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

|S|= 0

p = *

α = 0.1

*VC concentration was not detected in any of the 7 samples; therefore, a Kendall-Mann test is necessary nor appropriate.

Conclusion: No trend is discernible; all samples are nondetects.

Monitoring Well C-20

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05							Positive Values	Negative Values	S
VC (µg/L)	228	167	86.7	48.9	13.6	1.6									
		-61	-141.3	-179.1	-214.4	-226.4							0	4	
			-80.3	-118.1	-153.4	-165.4							0	4	
				-37.8	-73.1	-85.1							0	3	
					-35.3	-47.3							0	2	
						-12							0	1	
													0	0	
													0	0	
													0	0	
													0	0	
													0	0	
													0	0	
													0	0	
													0	14	-14

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

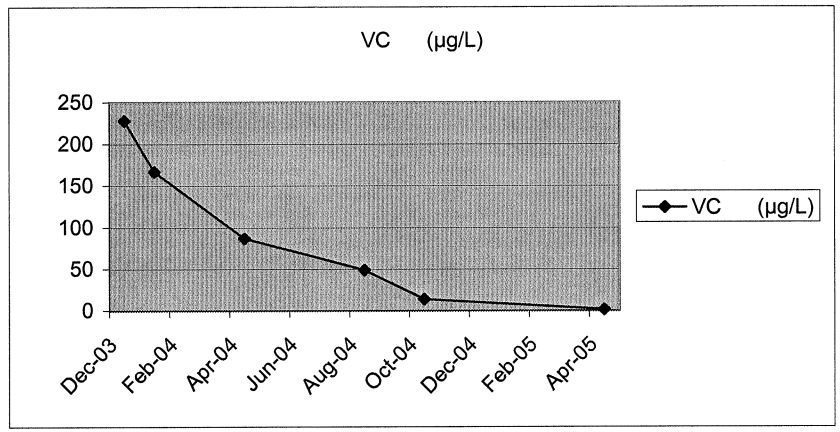
|S|= 14

p = < 0.0005

α = 0.1

A statistically significant decreasing cis 1,2-DCE concentration trend is indicated based on the p level ($p>\alpha$) and sign (-) of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-21

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
VC (µg/L)	*2*	*2*	*2*	*2*	*2*	*2*								
		0	0	0	0	0						0	0	
			0	0	0	0						0	0	
				0	0	0						0	0	
					0	0						0	0	
						0						0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	0

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

|S|= 0

p = *

α = 0.1

* VC concentration was not detected in any of the 3 samples; therefore, Kendall-Mann test is necessary nor appropriate.

Conclusion: No trend is discernible; all samples are nondetects.

Monitoring Well MW-105

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	0.53	0.64	0.75	0.32	0.339	*2*	*2*	*2*	*2*	*2*	*2*			
		0	0	0	0	0	-0.47	-0.36	-0.25	-0.68	-0.661	1	1	1	1	1	1	5	5	
			0	0	0	0	-0.47	-0.36	-0.25	-0.68	-0.661	1	1	1	1	1	1	5	5	
				0	0	0	-0.47	-0.36	-0.25	-0.68	-0.661	1	1	1	1	1	1	5	5	
					0	0	-0.47	-0.36	-0.25	-0.68	-0.661	1	1	1	1	1	1	5	5	
						0	-0.47	-0.36	-0.25	-0.68	-0.661	1	1	1	1	1	1	5	5	
							-0.47	-0.36	-0.25	-0.68	-0.661	1	1	1	1	1	1	5	5	
								0.11	0.22	-0.21	-0.191	1.47	1.47	1.47	1.47	1.47	1.47	7	2	
									0.11	-0.32	-0.301	1.36	1.36	1.36	1.36	1.36	1.36	6	2	
										-0.43	-0.411	1.25	1.25	1.25	1.25	1.25	1.25	5	2	
											0.019	1.68	1.68	1.68	1.68	1.68	1.68	6	0	
												1.661	1.661	1.661	1.661	1.661	1.661	5	0	
													0	0	0	0	0	0	0	
														0	0	0	0	0	0	
															0	0	0	0	0	
																0	0	0	0	
																	0			
																		59	36	23

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 14

|S|= 23

p = 1

α = 0.1

No statistically significant trend is indicated (p>α). However, it is noted that VC was detected only in 5 samples.
Conclusion: No trend is discernible; most of the samples are nondetects.

Notes:

1 Denotes detection limit value of a nondetect.

Monitoring Well MW-112

DATE	Jan-99	Feb-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05					Positive Values	Negative Values	S
VC (µg/L)	***5***	***25***	***1***	***2***	0.255	***10***	***2***							
		20	-4	-3	-4.745	5	-3					2	4	
			-24	-23	-24.745	-15	-23					0	5	
				1	-0.745	9	1					3	1	
					-1.745	8	0					1	1	
						9.745	1.745					2	0	
							-8							
												8	11	-3

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

|S|= 3

p = *

α = 0.1

*VC was detected in 1 of the samples; therefore a Mann Kendall test is not necessary or appropriate

Conclusion: No trend is discernible; VC was detected in only 1 sample.

Notes:

5 Denotes detection limit value of a nondetect.

Monitoring Well MW-117

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
VC (µg/L)	220	180	130	46	97	53	40	99	220	490	320	127	133	64	59.8	28.2	287	54			
		-40	-90	-174	-123	-167	-180	-121	0	270	100	-93	-87	-156	-160.2	-191.8	67	-166	3	12	
			-50	-134	-83	-127	-140	-81	40	310	140	-53	-47	-116	-120.2	-151.8	107	-126	4	11	
				-84	-33	-77	-90	-31	90	360	190	-3	3	-66	-70.2	-101.8	157	-76	5	9	
					51	7	-6	53	174	444	274	81	87	18	13.8	-17.8	241	8	11	2	
						-44	-57	2	123	393	223	30	36	-33	-37.2	-68.8	190	-43	7	5	
							-13	46	167	437	267	74	80	11	6.8	-24.8	234	1	9	2	
								59	180	450	280	87	93	24	19.8	-11.8	247	14	9	1	
									121	391	221	28	34	-35	-39.2	-70.8	188	-45	6	3	
										270	100	-93	-87	-156	-160.2	-191.8	67	-166	3	5	
											-170	-363	-357	-426	-430.2	-461.8	-203	-436	0	7	
												-193	-187	-256	-260.2	-291.8	-33	-266	0	6	
													6	-63	-67.2	-98.8	160	-73	2	3	
														-69	-73.2	-104.8	154	-79	1	3	
															-4.2	-35.8	223	-10	1	2	
																-31.6	227.2	-5.8	1	1	
																	258.8	25.8	1	0	
																		-233			
																			63	72	-9

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

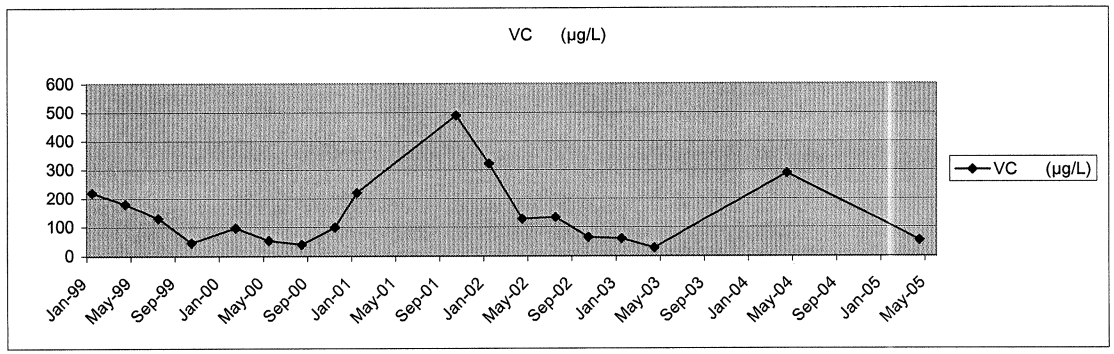
n = 18

|S|= 9

p = 0.808

α = 0.1

Results indicate no VC concentration trend (p>α). Conclusion: No trend is present.



Monitoring Well MW-120

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Positive Values	Negative Values	S
VC (µg/L)	120	83	53	36	54	***200***	36	33	1.4	***20***	36	23.7	***20***	66.3	41.8	61.3			
		-37	-67	-84	-66	80	-84	-87	-118.6	-100	-84	-96.3	-100	-53.7	-78.2	-58.7	1	14	
			-30	-47	-29	117	-47	-50	-81.6	-63	-47	-59.3	-63	-16.7	-41.2	-21.7	1	13	
				-17	1	147	-17	-20	-51.6	-33	-17	-29.3	-33	13.3	-11.2	8.3	4	9	
					18	164	0	-3	-34.6	-16	0	-12.3	-16	30.3	5.8	25.3	5	5	
						146	-18	-21	-52.6	-34	-18	-30.3	-34	12.3	-12.2	7.3	3	8	
							-164	-167	-198.6	-180	-164	-176.3	-180	-133.7	-158.2	-138.7	0	10	
								-3	-34.6	-16	0	-12.3	-16	30.3	5.8	25.3	3	5	
									-31.6	-13	3	-9.3	-13	33.3	8.8	28.3	4	4	
										18.6	34.6	22.3	18.6	64.9	40.4	59.9	7	0	
											16	3.7	0	46.3	21.8	41.3	5	0	
												-12.3	-16	30.3	5.8	25.3	3	2	
													-3.7	42.6	18.1	37.6	3	1	
														46.3	21.8	41.3	3	0	
															-24.5	-5	0	2	
																19.5	1	0	
																	43	73	-30

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 16

|S|= 30

p = 0.221

α = 0.1

No statistically significant decreasing VC concentration trend is indicated based on the p value (p>a). Note that the nondetect sample from August 2000 was not used in this evaluation because it was elevated with respect to the detected concentrations and other detection limits.

Conclusion: No trend is present.

Notes:

200 Denotes detection limit value of a nondetect.

Monitoring Well MW-122A

DATE	Oct-99	Aug-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05					Positive Values	Negative Values	S
VC (µg/L)	***100***	***25***	***1***	***20***	0.937	***20***	***1***							
		-75	-99	-80	-99.063	-80	-99					0	6	
			-24	-5	-24.063	-5	-24					0	5	
				19	-0.063	19	0					2	1	
					-19.063	0	-19					0	2	
						19.063	0.063					2	0	
							-19							
												4	14	-10

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

|S|= 10

p = *

α = 0.1

*Analyte was detected in only 1 of 6 rounds of sampling. Therefore, the Kendall-Mann Test is not appropriate and no VC concentration trend is indicated.
Conclusion: No trend is discernible; majority of samples are nondetects.

Notes:

1 Denotes detection limit value of a nondetect.

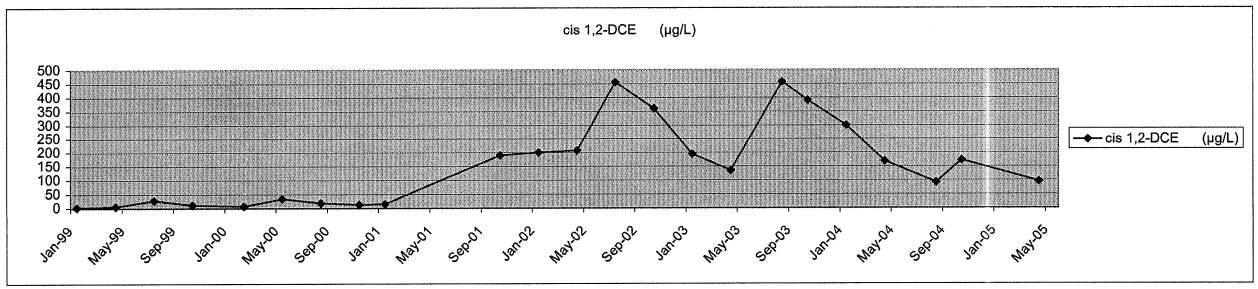
Monitoring Well C-1

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	2.9	6.3	28	12	7.4	34	19	13	15	190	200	208	456	360	195	135	457	391	299	169	91.6	172	95			
		3.4	25.1	9.1	4.5	31.1	16.1	10.1	12.1	187.1	197.1	205.1	453.1	357.1	192.1	132.1	454.1	388.1	296.1	166.1	88.7	169.1	92.1	22	0	
			21.7	5.7	1.1	27.7	12.7	6.7	8.7	183.7	193.7	201.7	449.7	353.7	188.7	128.7	450.7	384.7	292.7	162.7	85.3	165.7	88.7	21	0	
				-16	-20.6	6	-9	-15	-13	162	172	180	428	332	167	107	429	363	271	141	63.6	144	67	15	5	
					-4.6	22	7	1	3	178	188	196	444	348	183	123	445	379	287	157	79.6	160	83	18	1	
						26.6	11.6	5.6	7.6	182.6	192.6	200.6	448.6	352.6	187.6	127.6	449.6	383.6	291.6	161.6	84.2	164.6	87.6	18	0	
							-15	-21	-19	156	166	174	422	326	161	101	423	357	265	135	57.6	138	61	14	3	
								-6	-4	171	181	189	437	341	176	116	438	372	280	150	72.6	153	76	14	2	
									2	177	187	195	443	347	182	122	444	378	286	156	78.6	159	82	15	0	
										175	185	193	441	345	180	120	442	376	284	154	76.6	157	80	14	0	
											10	18	266	170	5	-55	267	201	109	-21	-98.4	-18	-95	8	5	
												8	256	160	-5	-65	257	191	99	-31	-108.4	-28	-105	6	6	
													248	152	-13	-73	249	183	91	-39	-116.4	-36	-113	5	6	
														-96	-261	-321	1	-65	-157	-287	-364.4	-284	-361	1	9	
															-165	-225	97	31	-61	-191	-268.4	-188	-265	2	7	
																-60	262	196	104	-26	-103.4	-23	-100	3	5	
																	322	256	164	34	-43.4	37	-40	5	2	
																		-66	-158	-288	-365.4	-285	-362	0	6	
																			-92	-222	-299.4	-219	-296	0	5	
																				-130	-207.4	-127	-204	0	4	
																					-77.4	3	-74	1	2	
																						80.4	3.4	2	0	
																							-77			
																								162	68	94

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 23
|S|= 94
p < 0.0005
α = 0.1

A statistically significant increasing cis-1,2-DCE concentration trend is indicated by the p value ($p<\alpha$) and sign (+) of the S value.

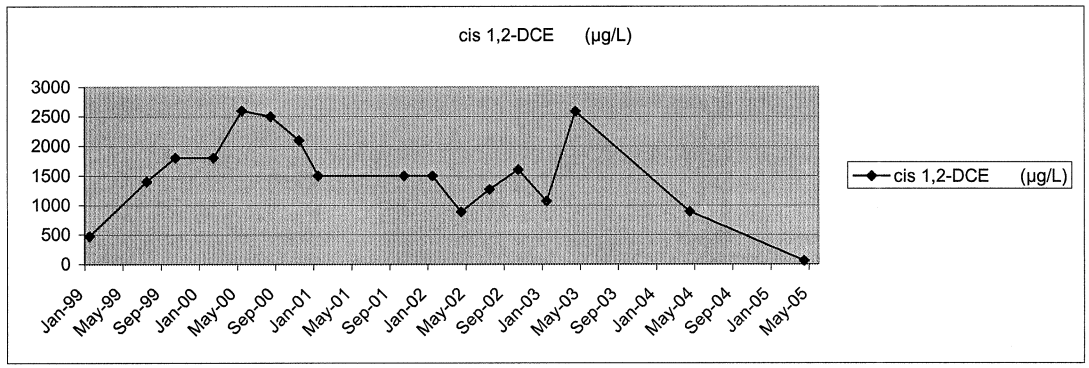
Conclusion: An increasing trend is present.



Monitoring Well C-2A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	470	1400	1800	1800	2600	2500	2100	1500	1500	1500	884	1270	1600	1070	2590	891	58			
		930	1330	1330	2130	2030	1630	1030	1030	1030	414	800	1130	600	2120	421	-412	15	1	
			400	400	1200	1100	700	100	100	100	-516	-130	200	-330	1190	-509	-1342	10	5	
				0	800	700	300	-300	-300	-300	-916	-530	-200	-730	790	-909	-1742	4	9	
					800	700	300	-300	-300	-300	-916	-530	-200	-730	790	-909	-1742	4	9	
						-100	-500	-1100	-1100	-1100	-1716	-1330	-1000	-1530	-10	-1709	-2542	0	12	
							-400	-1000	-1000	-1000	-1616	-1230	-900	-1430	90	-1609	-2442	1	10	
								-600	-600	-600	-1216	-830	-500	-1030	490	-1209	-2042	1	9	
									0	0	-616	-230	100	-430	1090	-609	-1442	2	5	
										0	-616	-230	100	-430	1090	-609	-1442	2	5	
											-616	-230	100	-430	1090	-609	-1442	2	5	
												386	716	186	1706	7	-826	5	1	
													330	-200	1320	-379	-1212	2	3	
														-530	990	-709	-1542	1	3	
															1520	-179	-1012	1	2	
																-1699	-2532	0	2	
																	-833	0	1	
																		50	82	-32

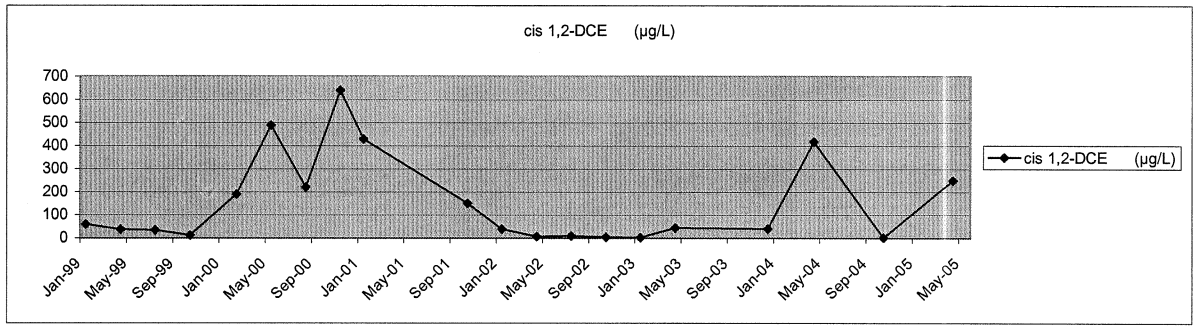
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 32
p = 0.506
α = 0.1
No statistically significant cis-1,2-DCE concentration trend is indicated ($p>\alpha$).
Conclusion: No trend is present.



Monitoring Well C-3A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	60	38	35	12	190	490	220	640	430	150	39	7.17	10.4	4.1	3.05	44.7	41.1	418	1	250			
		-22	-25	-48	130	430	160	580	370	90	-21	-52.83	-49.6	-55.9	-56.95	-15.3	-18.9	358	-59	190	8	11	
			-3	-26	152	452	182	602	392	112	1	-30.83	-27.6	-33.9	-34.95	6.7	3.1	380	-37	212	11	7	
				-23	155	455	185	605	395	115	4	-27.83	-24.6	-30.9	-31.95	9.7	6.1	383	-34	215	11	6	
					178	478	208	628	418	138	27	-4.83	-1.6	-7.9	-8.95	32.7	29.1	406	-11	238	11	5	
						300	30	450	240	-40	-151	-182.83	-179.6	-185.9	-186.95	-145.3	-148.9	228	-189	60	6	9	
							-270	150	-60	-340	-451	-482.83	-479.6	-485.9	-486.95	-445.3	-448.9	-72	-489	-240	1	13	
								420	210	-70	-181	-212.83	-209.6	-215.9	-216.95	-175.3	-178.9	198	-219	30	4	9	
									-210	-490	-601	-632.83	-629.6	-635.9	-636.95	-595.3	-598.9	-222	-639	-390	0	12	
										-280	-391	-422.83	-419.6	-425.9	-426.95	-385.3	-388.9	-12	-429	-180	0	11	
											-111	-142.83	-139.6	-145.9	-146.95	-105.3	-108.9	268	-149	100	2	8	
												-31.83	-28.6	-34.9	-35.95	5.7	2.1	379	-38	211	4	5	
													3.23	-3.07	-4.12	37.53	33.93	410.83	-6.17	242.83	5	3	
														-6.3	-7.35	34.3	30.7	407.6	-9.4	239.6	4	3	
															-1.05	40.6	37	413.9	-3.1	245.9	4	2	
																41.65	38.05	414.95	-2.05	246.95	4	1	
																	-3.6	373.3	-43.7	205.3	2	2	
																		376.9	-40.1	208.9	2	1	
																			-417	-168	0	2	
																				249	1	0	
																					61	92	-31

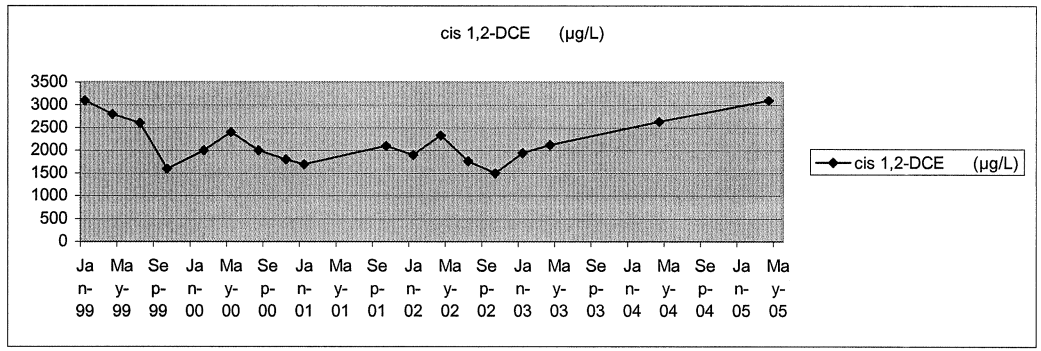
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 31
p = < 0.0005
α = 0.05
A Statistically significant decreasing cis 1,2-DCE concentration trend is indicated based on p level (p>α) and sign (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-4A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	3100	2800	2600	1600	2000	2400	2000	1800	1700	2100	1900	2330	1770	1500	1940	2120	2630	3100			
		-300	-500	-1500	-1100	-700	-1100	-1300	-1400	-1000	-1200	-770	-1330	-1600	-1160	-980	-470	0	0	16	
			-200	-1200	-800	-400	-800	-1000	-1100	-700	-900	-470	-1030	-1300	-860	-680	-170	300	1	15	
				-1000	-600	-200	-600	-800	-900	-500	-700	-270	-830	-1100	-660	-480	30	500	2	13	
					400	800	400	200	100	500	300	730	170	-100	340	520	1030	1500	13	1	
						400	0	-200	-300	100	-100	330	-230	-500	-60	120	630	1100	6	6	
							-400	-600	-700	-300	-500	-70	-630	-900	-460	-280	230	700	2	10	
								-200	-300	100	-100	330	-230	-500	-60	120	630	1100	5	6	
									-100	300	100	530	-30	-300	140	320	830	1300	7	3	
										400	200	630	70	-200	240	420	930	1400	8	1	
											-200	230	-330	-600	-160	20	530	1000	4	4	
												430	-130	-400	40	220	730	1200	5	2	
													-560	-830	-390	-210	300	770	2	4	
														-270	170	350	860	1330	4	1	
															440	620	1130	1600	4	0	
																180	690	1160	3	0	
																	510	980	2	0	
																		470	1	0	
																			69	82	-13

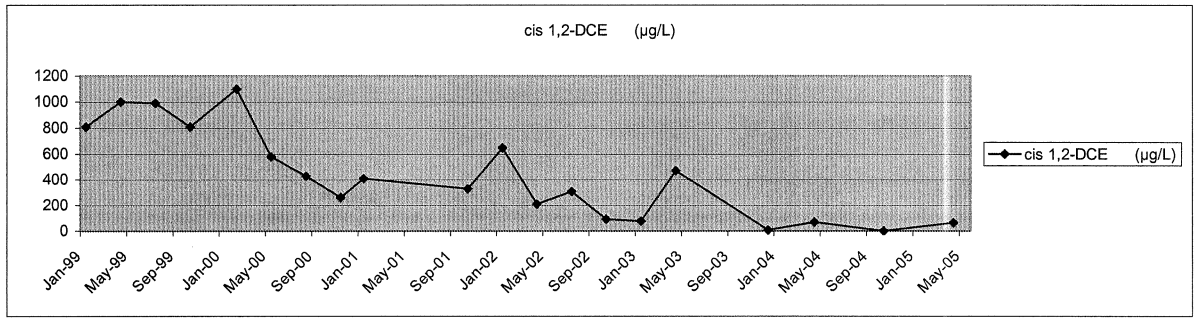
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 17
|S|= 13
p = 0.253
α = 0.1
No statistically significant cis-1,2-DCE concentration trend is indicated ($p>\alpha$).
Conclusion: No trend is present.



Monitoring Well C-5A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	810	1000	990	810	1100	580	430	260	410	330	650	210	307	92	76.3	472	8.58	69.7	1	65			
		190	180	0	290	-230	-380	-550	-400	-480	-160	-600	-503	-718	-733.7	-338	-801.42	-740.3	-809	-745	3	15	
			-10	-190	100	-420	-570	-740	-590	-670	-350	-790	-693	-908	-923.7	-528	-991.42	-930.3	-999	-935	1	17	
				-180	110	-410	-560	-730	-580	-660	-340	-780	-683	-898	-913.7	-518	-981.42	-920.3	-989	-925	1	16	
					290	-230	-380	-550	-400	-480	-160	-600	-503	-718	-733.7	-338	-801.42	-740.3	-809	-745	1	15	
						-520	-670	-840	-690	-770	-450	-890	-793	-1008	-1023.7	-628	-1091.42	-1030.3	-1099	-1035	0	15	
							-150	-320	-170	-250	70	-370	-273	-488	-503.7	-108	-571.42	-510.3	-579	-515	1	13	
								-170	-20	-100	220	-220	-123	-338	-353.7	42	-421.42	-360.3	-429	-365	2	11	
									150	70	390	-50	47	-168	-183.7	212	-251.42	-190.3	-259	-195	5	7	
										-80	240	-200	-103	-318	-333.7	62	-401.42	-340.3	-409	-345	2	9	
											320	-120	-23	-238	-253.7	142	-321.42	-260.3	-329	-265	2	8	
												-440	-343	-558	-573.7	-178	-641.42	-580.3	-649	-585	0	9	
													97	-118	-133.7	262	-201.42	-140.3	-209	-145	2	6	
														-215	-230.7	165	-298.42	-237.3	-306	-242	1	6	
															-15.7	380	-83.42	-22.3	-91	-27	1	5	
																395.7	-67.72	-6.6	-75.3	-11.3	1	4	
																	-463.42	-402.3	-471	-407	0	4	
																		61.12	-7.58	56.42	2	1	
																			-68.7	-4.7	0	2	
																				64	1	0	
																					22	131	-109

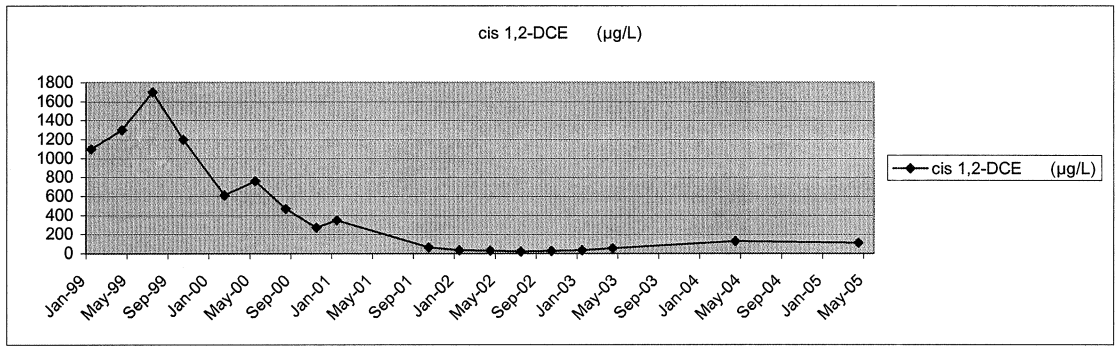
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 109
p < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on p level (p<α) and (-) of S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-5B

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	1100	1300	1700	1200	610	760	470	270	350	63	34	30.7	18.8	28	33.1	52.1	128	110			
		200	600	100	-490	-340	-630	-830	-750	-1037	-1066	-1069.3	-1081.2	-1072	-1066.9	-1047.9	-972	-990	3	14	
			400	-100	-690	-540	-830	-1030	-950	-1237	-1266	-1269.3	-1281.2	-1272	-1266.9	-1247.9	-1172	-1190	1	15	
				-500	-1090	-940	-1230	-1430	-1350	-1637	-1666	-1669.3	-1681.2	-1672	-1666.9	-1647.9	-1572	-1590	0	15	
					-590	-440	-730	-930	-850	-1137	-1166	-1169.3	-1181.2	-1172	-1166.9	-1147.9	-1072	-1090	0	14	
						150	-140	-340	-260	-547	-576	-579.3	-591.2	-582	-576.9	-557.9	-482	-500	1	12	
							-290	-490	-410	-697	-726	-729.3	-741.2	-732	-726.9	-707.9	-632	-650	0	12	
								-200	-120	-407	-436	-439.3	-451.2	-442	-436.9	-417.9	-342	-360	0	11	
									80	-207	-236	-239.3	-251.2	-242	-236.9	-217.9	-142	-160	1	9	
										-287	-316	-319.3	-331.2	-322	-316.9	-297.9	-222	-240	0	9	
											-29	-32.3	-44.2	-35	-29.9	-10.9	65	47	2	6	
												-3.3	-15.2	-6	-0.9	18.1	94	76	3	4	
													-11.9	-2.7	2.4	21.4	97.3	79.3	4	2	
														9.2	14.3	33.3	109.2	91.2	5	0	
															5.1	24.1	100	82	4	0	
																19	94.9	76.9	3	0	
																	75.9	57.9	2	0	
																		-18	0	1	
																			29	124	-95

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 95
p < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on p level ($p<\alpha$) and (-) of S value.
Conclusion: Decreasing trend is present.



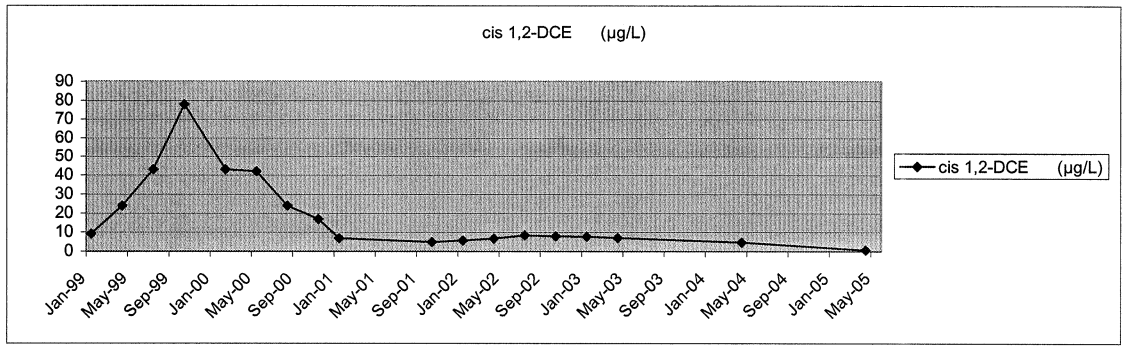
Monitoring Well C-5C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	9.3	24	43	78	43	42	24	17	6.9	4.8	5.7	6.67	8.43	7.8	7.69	7.09	4.69	0.67			
		14.7	33.7	68.7	33.7	32.7	14.7	7.7	-2.4	-4.5	-3.6	-2.63	-0.87	-1.5	-1.61	-2.21	-4.61	-8.63	7	10	
			19	54	19	18	0	-7	-17.1	-19.2	-18.3	-17.33	-15.57	-16.2	-16.31	-16.91	-19.31	-23.33	4	11	
				35	0	-1	-19	-26	-36.1	-38.2	-37.3	-36.33	-34.57	-35.2	-35.31	-35.91	-38.31	-42.33	1	13	
					-35	-36	-54	-61	-71.1	-73.2	-72.3	-71.33	-69.57	-70.2	-70.31	-70.91	-73.31	-77.33	0	14	
						-1	-19	-26	-36.1	-38.2	-37.3	-36.33	-34.57	-35.2	-35.31	-35.91	-38.31	-42.33	0	13	
							-18	-25	-35.1	-37.2	-36.3	-35.33	-33.57	-34.2	-34.31	-34.91	-37.31	-41.33	0	12	
								-7	-17.1	-19.2	-18.3	-17.33	-15.57	-16.2	-16.31	-16.91	-19.31	-23.33	0	11	
									-10.1	-12.2	-11.3	-10.33	-8.57	-9.2	-9.31	-9.91	-12.31	-16.33	0	10	
										-2.1	-1.2	-0.23	1.53	0.9	0.79	0.19	-2.21	-6.23	4	5	
											0.9	1.87	3.63	3	2.89	2.29	-0.11	-4.13	6	2	
												0.97	2.73	2.1	1.99	1.39	-1.01	-5.03	5	2	
													1.76	1.13	1.02	0.42	-1.98	-6	4	2	
														-0.63	-0.74	-1.34	-3.74	-7.76	0	5	
															-0.11	-0.71	-3.11	-7.13	0	4	
																-0.6	-3	-7.02	0	3	
																	-2.4	-6.42	0	2	
																		-4.02	0	1	
																			31	120	-89

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 89
p < 0.0005
α = 0.05

A statistically significant overall decreasing cis-1,2-DCE concentration trend is indicated based on the p value (p<α) and the sign (-) of the S value.

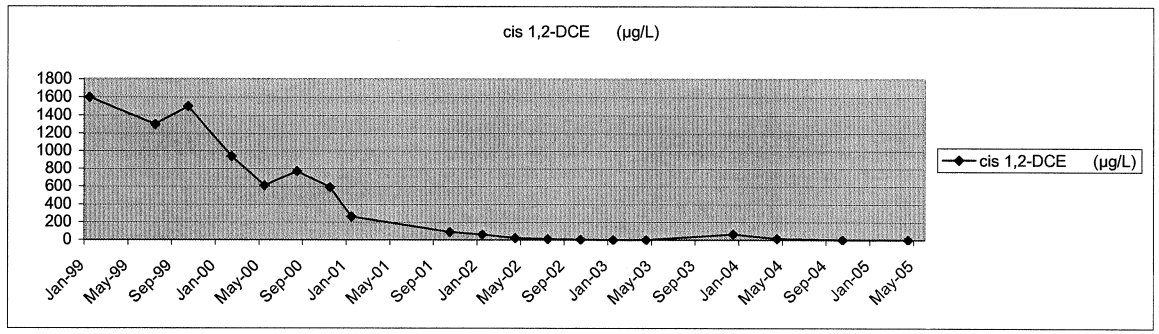
Conclusion: An overall decreasing trend is present, and significant trends exist within subsets of the data.



Monitoring Well C-7A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	1600	1300	1500	940	610	770	590	260	89	61	21.4	11.9	2.7	1.31	0.575	63.6	15	*1*	*1*			
		-300	-100	-660	-990	-830	-1010	-1340	-1511	-1539	-1578.6	-1588.1	-1597.3	-1598.69	-1599.425	-1536.4	-1585	-1599	-1599	0	18	
			200	-360	-690	-530	-710	-1040	-1211	-1239	-1278.6	-1288.1	-1297.3	-1298.69	-1299.425	-1236.4	-1285	-1299	-1299	1	16	
				-560	-890	-730	-910	-1240	-1411	-1439	-1478.6	-1488.1	-1497.3	-1498.69	-1499.425	-1436.4	-1485	-1499	-1499	0	16	
					-330	-170	-350	-680	-851	-879	-918.6	-928.1	-937.3	-938.69	-939.425	-876.4	-925	-939	-939	0	15	
						160	-20	-350	-521	-549	-588.6	-598.1	-607.3	-608.69	-609.425	-546.4	-595	-609	-609	1	13	
							-180	-510	-681	-709	-748.6	-758.1	-767.3	-768.69	-769.425	-706.4	-755	-769	-769	0	13	
								-330	-501	-529	-568.6	-578.1	-587.3	-588.69	-589.425	-526.4	-575	-589	-589	0	12	
									-171	-199	-238.6	-248.1	-257.3	-258.69	-259.425	-196.4	-245	-259	-259	0	11	
										-28	-67.6	-77.1	-86.3	-87.69	-88.425	-25.4	-74	-88	-88	0	10	
											-39.6	-49.1	-58.3	-59.69	-60.425	2.6	-46	-60	-60	1	8	
												-9.5	-18.7	-20.09	-20.825	42.2	-6.4	-20.4	-20.4	1	7	
													-9.2	-10.59	-11.325	51.7	3.1	-10.9	-10.9	2	5	
														-1.39	-2.125	60.9	12.3	-1.7	-1.7	2	4	
															-0.735	62.29	13.69	-0.31	-0.31	2	3	
																63.025	14.425	0.425	0.425	4	0	
																	-48.6	-62.6	-62.6	0	3	
																		-14	-14	0	2	
																			0	0	0	
																				13	122	-109

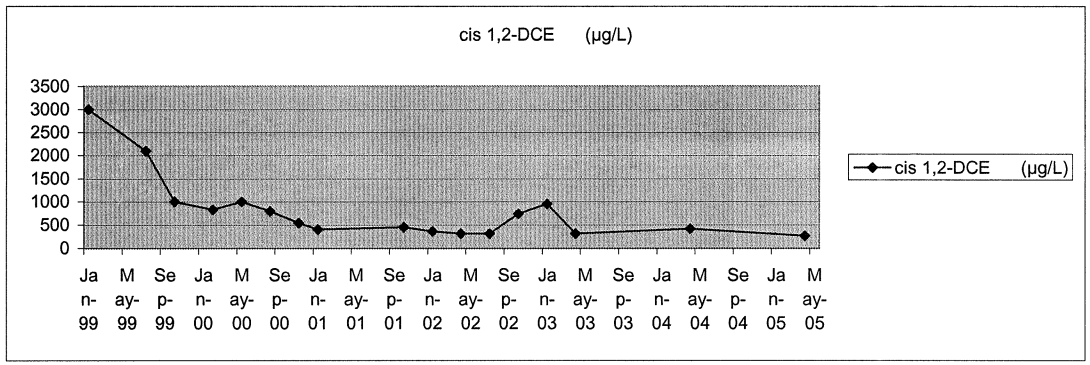
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 19
|S|= 109
p < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on p level (p<α) and (-) of S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-8A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	3000	2100	1000	830	1000	790	540	400	450	360	314	315	740	951	312	415	270			
		-900	-2000	-2170	-2000	-2210	-2460	-2600	-2550	-2640	-2686	-2685	-2260	-2049	-2688	-2585	-2730	0	16	
			-1100	-1270	-1100	-1310	-1560	-1700	-1650	-1740	-1786	-1785	-1360	-1149	-1788	-1685	-1830	0	15	
				-170	0	-210	-460	-600	-550	-640	-686	-685	-260	-49	-688	-585	-730	0	13	
					170	-40	-290	-430	-380	-470	-516	-515	-90	121	-518	-415	-560	2	11	
						-210	-460	-600	-550	-640	-686	-685	-260	-49	-688	-585	-730	0	12	
							-250	-390	-340	-430	-476	-475	-50	161	-478	-375	-520	1	10	
								-140	-90	-180	-226	-225	200	411	-228	-125	-270	2	8	
									50	-40	-86	-85	340	551	-88	15	-130	4	5	
										-90	-136	-135	290	501	-138	-35	-180	2	6	
											-46	-45	380	591	-48	55	-90	3	4	
												1	426	637	-2	101	-44	4	2	
													425	636	-3	100	-45	3	2	
														211	-428	-325	-470	1	3	
															-639	-536	-681	0	3	
																103	-42	1	1	
																	-145	0	1	
																		23	112	-89

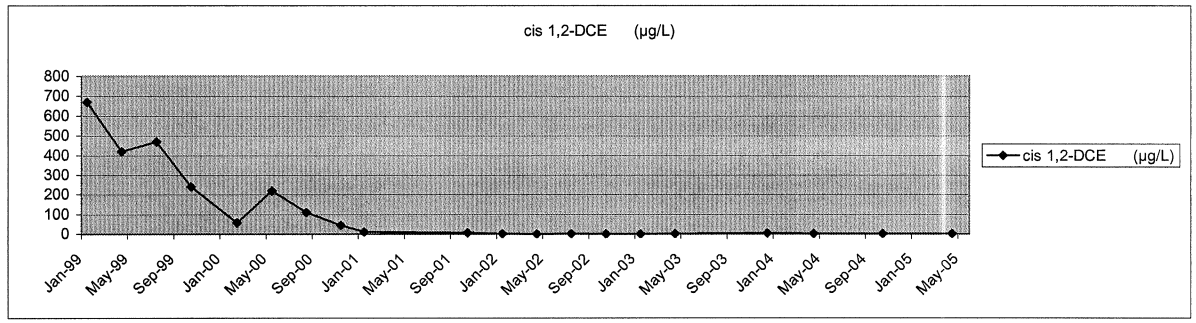
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 89
p < 0.0005
α = 0.1
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated by the p value ($p<\alpha$) and the (-) sign of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-9A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	670	420	470	240	58	220	110	45	12	6.9	1.1	0.495	1.57	0.45	0.387	1.22	5.08	1.34	*1*	*1*			
		-250	-200	-430	-612	-450	-560	-625	-658	-663.1	-668.9	-669.505	-668.43	-669.55	-669.613	-668.78	-664.92	-668.66	-669	-669	0	19	
			50	-180	-362	-200	-310	-375	-408	-413.1	-418.9	-419.505	-418.43	-419.55	-419.613	-418.78	-414.92	-418.66	-419	-419	1	17	
				-230	-412	-250	-360	-425	-458	-463.1	-468.9	-469.505	-468.43	-469.55	-469.613	-468.78	-464.92	-468.66	-469	-469	0	17	
					-182	-20	-130	-195	-228	-233.1	-238.9	-239.505	-238.43	-239.55	-239.613	-238.78	-234.92	-238.66	-239	-239	0	16	
						162	52	-13	-46	-51.1	-56.9	-57.505	-56.43	-57.55	-57.613	-56.78	-52.92	-56.66	-57	-57	2	13	
							-110	-175	-208	-213.1	-218.9	-219.505	-218.43	-219.55	-219.613	-218.78	-214.92	-218.66	-219	-219	0	14	
								-65	-98	-103.1	-108.9	-109.505	-108.43	-109.55	-109.613	-108.78	-104.92	-108.66	-109	-109	0	13	
									-33	-38.1	-43.9	-44.505	-43.43	-44.55	-44.613	-43.78	-39.92	-43.66	-44	-44	0	12	
										-5.1	-10.9	-11.505	-10.43	-11.55	-11.613	-10.78	-6.92	-10.66	-11	-11	0	11	
											-5.8	-6.405	-5.33	-6.45	-6.513	-5.68	-1.82	-5.56	-5.9	-5.9	0	10	
												-0.605	0.47	-0.65	-0.713	0.12	3.98	0.24	-0.1	-0.1	4	5	
													1.075	-0.045	-0.108	0.725	4.585	0.845	0.505	0.505	6	2	
														-1.12	-1.183	-0.35	3.51	-0.23	-0.57	-0.57	1	6	
															-0.063	0.77	4.63	0.89	0.55	0.55	5	1	
																0.833	4.693	0.953	0.613	0.613	5	0	
																	3.86	0.12	-0.22	-0.22	2	2	
																		-3.74	-4.08	-4.08	0	3	
																			-0.34	-0.34	0	2	
																				0	0	0	
																					25	127	-102

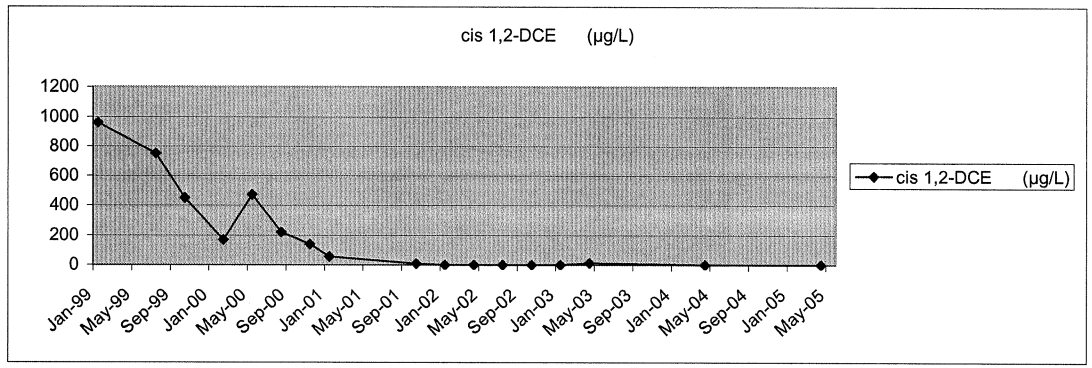
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 20
|S|= 102
p < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on p level ($p<\alpha$) and (-) of S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-9B

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	960	750	450	170	470	220	140	56	9.1	0.99	0.362	0.939	0.42	0.353	13.3	1.01	*1*			
		-210	-510	-790	-490	-740	-820	-904	-950.9	-959.01	-959.638	-959.061	-959.58	-959.647	-946.7	-958.99	-959	0	16	
			-300	-580	-280	-530	-610	-694	-740.9	-749.01	-749.638	-749.061	-749.58	-749.647	-736.7	-748.99	-749	0	15	
				-280	20	-230	-310	-394	-440.9	-449.01	-449.638	-449.061	-449.58	-449.647	-436.7	-448.99	-449	1	13	
					300	50	-30	-114	-160.9	-169.01	-169.638	-169.061	-169.58	-169.647	-156.7	-168.99	-169	2	11	
						-250	-330	-414	-460.9	-469.01	-469.638	-469.061	-469.58	-469.647	-456.7	-468.99	-469	0	12	
							-80	-164	-210.9	-219.01	-219.638	-219.061	-219.58	-219.647	-206.7	-218.99	-219	0	11	
								-84	-130.9	-139.01	-139.638	-139.061	-139.58	-139.647	-126.7	-138.99	-139	0	10	
									-46.9	-55.01	-55.638	-55.061	-55.58	-55.647	-42.7	-54.99	-55	0	9	
										-8.11	-8.738	-8.161	-8.68	-8.747	4.2	-8.09	-8.1	1	7	
											-0.628	-0.051	-0.57	-0.637	12.31	0.02	0.01	3	4	
												0.577	0.058	-0.009	12.938	0.648	0.638	5	1	
													-0.519	-0.586	12.361	0.071	0.061	3	2	
														-0.067	12.88	0.59	0.58	3	1	
															12.947	0.657	0.647	3	0	
																-12.29	-12.3	0	2	
																	-0.01	0	1	
																		21	115	-94

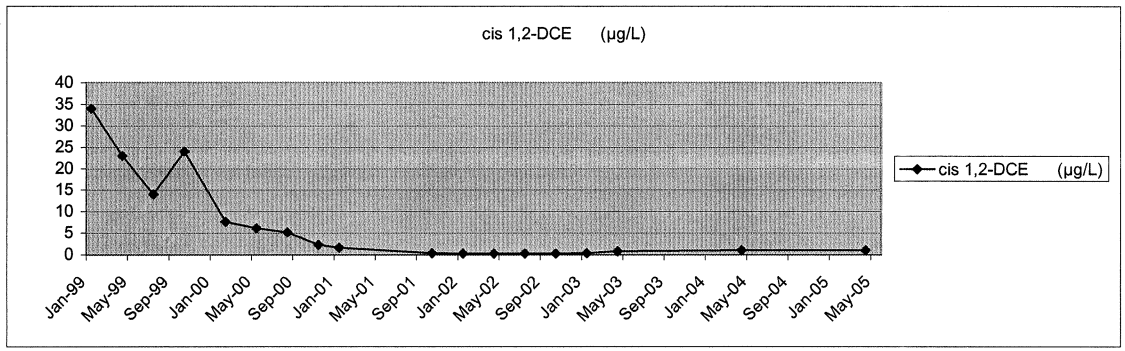
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 16
|S|= 94
p < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on p level (p<α) and (-) of S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-9C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	34	23	14	24	7.6	6.1	5.2	2.3	1.6	0.39	0.27	0.307	0.321	0.3	0.364	0.817	*1*	*1*			
		-11	-20	-10	-26.4	-27.9	-28.8	-31.7	-32.4	-33.61	-33.73	-33.693	-33.679	-33.7	-33.636	-33.183	-33	-33	0	17	
			-9	1	-15.4	-16.9	-17.8	-20.7	-21.4	-22.61	-22.73	-22.693	-22.679	-22.7	-22.636	-22.183	-22	-22	1	15	
				10	-6.4	-7.9	-8.8	-11.7	-12.4	-13.61	-13.73	-13.693	-13.679	-13.7	-13.636	-13.183	-13	-13	1	14	
					-16.4	-17.9	-18.8	-21.7	-22.4	-23.61	-23.73	-23.693	-23.679	-23.7	-23.636	-23.183	-23	-23	0	14	
						-1.5	-2.4	-5.3	-6	-7.21	-7.33	-7.293	-7.279	-7.3	-7.236	-6.783	-6.6	-6.6	0	13	
							-0.9	-3.8	-4.5	-5.71	-5.83	-5.793	-5.779	-5.8	-5.736	-5.283	-5.1	-5.1	0	12	
								-2.9	-3.6	-4.81	-4.93	-4.893	-4.879	-4.9	-4.836	-4.383	-4.2	-4.2	0	11	
									-0.7	-1.91	-2.03	-1.993	-1.979	-2	-1.936	-1.483	-1.3	-1.3	0	10	
										-1.21	-1.33	-1.293	-1.279	-1.3	-1.236	-0.783	-0.6	-0.6	0	9	
											-0.12	-0.083	-0.069	-0.09	-0.026	0.427	0.61	0.61	3	5	
												0.037	0.051	0.03	0.094	0.547	0.73	0.73	7	0	
													0.014	-0.007	0.057	0.51	0.693	0.693	5	1	
														-0.021	0.043	0.496	0.679	0.679	4	1	
															0.064	0.517	0.7	0.7	4	0	
																0.453	0.636	0.636	3	0	
																	0.183	0.183	2	0	
																		0	0	0	
																			30	122	-92

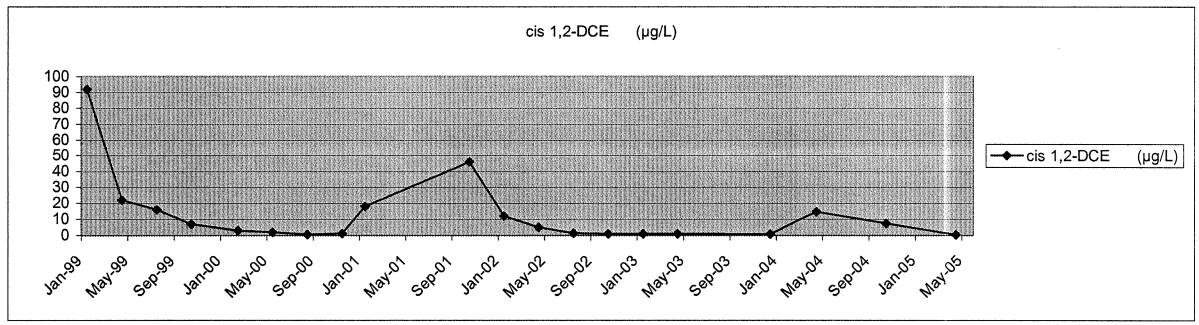
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 17
|S|= 92
p < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on p level (p<α) and (-) of S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-10

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	92	22	16	7.1	3.1	2	0.68	1.3	18	46	12	4.97	1.32	*1*	*1*	*1*	0.831	14.7	7.5	*0.5*			
		-70	-76	-84.9	-88.9	-90	-91.32	-90.7	-74	-46	-80	-87.03	-90.68	-91	-91	-91	-91.169	-77.3	-84.5	-91.5	0	19	
			-6	-14.9	-18.9	-20	-21.32	-20.7	-4	24	-10	-17.03	-20.68	-21	-21	-21	-21.169	-7.3	-14.5	-21.5	1	17	
				-8.9	-12.9	-14	-15.32	-14.7	2	30	-4	-11.03	-14.68	-15	-15	-15	-15.169	-1.3	-8.5	-15.5	2	15	
					-4	-5.1	-6.42	-5.8	10.9	38.9	4.9	-2.13	-5.78	-6.1	-6.1	-6.1	-6.269	7.6	0.4	-6.6	5	11	
						-1.1	-2.42	-1.8	14.9	42.9	8.9	1.87	-1.78	-2.1	-2.1	-2.1	-2.269	11.6	4.4	-2.6	6	9	
							-1.32	-0.7	16	44	10	2.97	-0.68	-1	-1	-1	-1.169	12.7	5.5	-1.5	6	8	
								0.62	17.32	45.32	11.32	4.29	0.64	0.32	0.32	0.32	0.151	14.02	6.82	-0.18	12	1	
									16.7	44.7	10.7	3.67	0.02	-0.3	-0.3	-0.3	-0.469	13.4	6.2	-0.8	7	5	
										28	-6	-13.03	-16.68	-17	-17	-17	-17.169	-3.3	-10.5	-17.5	1	10	
											-34	-41.03	-44.68	-45	-45	-45	-45.169	-31.3	-38.5	-45.5	0	10	
												-7.03	-10.68	-11	-11	-11	-11.169	2.7	-4.5	-11.5	1	8	
													-3.65	-3.97	-3.97	-3.97	-4.139	9.73	2.53	-4.47	2	6	
														-0.32	-0.32	-0.32	-0.489	13.38	6.18	-0.82	2	5	
															0	0	-0.169	13.7	6.5	-0.5	2	2	
																0	-0.169	13.7	6.5	-0.5	2	2	
																	-0.169	13.7	6.5	-0.5	2	2	
																		13.869	6.669	-0.331	2	1	
																			-7.2	-14.2	0	2	
																				-7	0	1	
																					52	98	-46

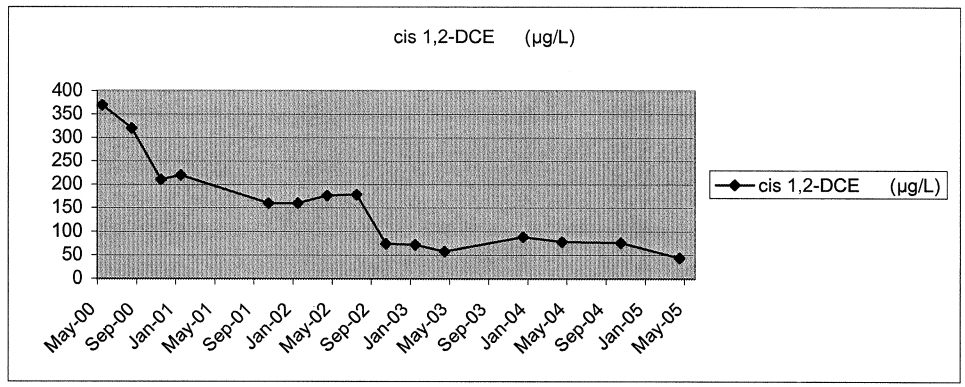
Ho = No concentration trend present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 20
|S|= 46
p = < 0.0005
α = 0.1
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated by the p value (p<α) and the(-) sign of the S value.
Conclusion: A decreasing trend is present.



Monitoring Well C-11

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	370	320	210	220	160	160	176	178	74	71.5	57.5	88.2	78	75.8	44			
		-50	-160	-150	-210	-210	-194	-192	-296	-298.5	-312.5	-281.8	-292	-294.2	-326	0	14	
			-110	-100	-160	-160	-144	-142	-246	-248.5	-262.5	-231.8	-242	-244.2	-276	0	13	
				10	-50	-50	-34	-32	-136	-138.5	-152.5	-121.8	-132	-134.2	-166	1	11	
					-60	-60	-44	-42	-146	-148.5	-162.5	-131.8	-142	-144.2	-176	0	11	
						0	16	18	-86	-88.5	-102.5	-71.8	-82	-84.2	-116	2	7	
							16	18	-86	-88.5	-102.5	-71.8	-82	-84.2	-116	2	7	
								2	-102	-104.5	-118.5	-87.8	-98	-100.2	-132	1	7	
									-104	-106.5	-120.5	-89.8	-100	-102.2	-134	0	7	
										-2.5	-16.5	14.2	4	1.8	-30	3	3	
											-14	16.7	6.5	4.3	-27.5	3	2	
												30.7	20.5	18.3	-13.5	3	1	
													-10.2	-12.4	-44.2	0	3	
														-2.2	-34	0	2	
															-31.8	0	1	
																15	89	-74

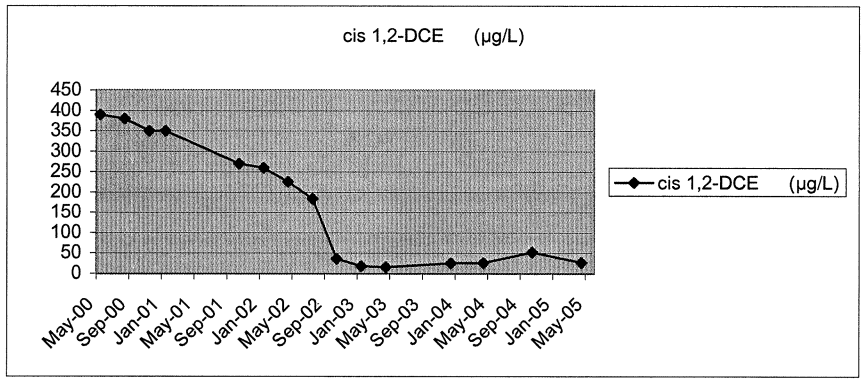
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 74
p = < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated by the p value ($p<\alpha$) and the(-) sign of the S value.
Conclusion: A decreasing trend is present.



Monitoring Well C-12

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	390	380	350	350	270	260	226	184	36	18.1	15.7	25.1	25.7	52	27			
		-10	-40	-40	-120	-130	-164	-206	-354	-371.9	-374.3	-364.9	-364.3	-338	-363	0	14	
			-30	-30	-110	-120	-154	-196	-344	-361.9	-364.3	-354.9	-354.3	-328	-353	0	13	
				0	-80	-90	-124	-166	-314	-331.9	-334.3	-324.9	-324.3	-298	-323	0	11	
					-80	-90	-124	-166	-314	-331.9	-334.3	-324.9	-324.3	-298	-323	0	11	
						-10	-44	-86	-234	-251.9	-254.3	-244.9	-244.3	-218	-243	0	10	
							-34	-76	-224	-241.9	-244.3	-234.9	-234.3	-208	-233	0	9	
								-42	-190	-207.9	-210.3	-200.9	-200.3	-174	-9	0	8	
									-148	-165.9	-168.3	-158.9	-158.3	-132	-157	0	7	
										-17.9	-20.3	-10.9	-10.3	16	-9	1	5	
											-2.4	7	7.6	33.9	8.9	4	1	
												9.4	10	36.3	11.3	4	0	
													0.6	26.9	1.9	3	0	
														26.3	1.3	2	0	
															-25	0	1	
																14	90	-76

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 76
p < < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated by the p value ($p<\alpha$) and the(-) sign of the S value.
Conclusion: A decreasing trend is present.

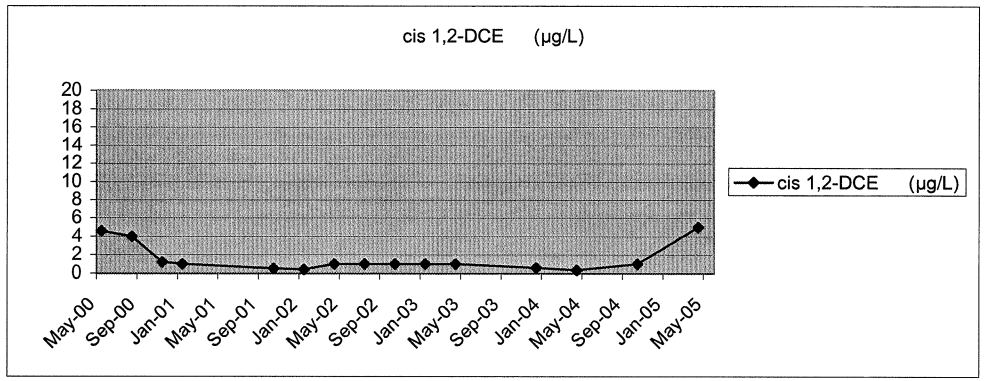


Monitoring Well C-13

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	4.6	4	1.2	*1*	0.51	0.42	*1*	*1*	*1*	*1*	*1*	0.59	0.331	*1*	*5*			
		-0.6	-3.4	-3.6	-4.09	-4.18	-3.6	-3.6	-3.6	-3.6	-3.6	-4.01	-4.269	-3.6	0.4	1	13	
			-2.8	-3	-3.49	-3.58	-3	-3	-3	-3	-3	-3.41	-3.669	-3	1	1	12	
				-0.2	-0.69	-0.78	-0.2	-0.2	-0.2	-0.2	-0.2	-0.61	-0.869	-0.2	3.8	1	11	
					-0.49	-0.58	0	0	0	0	0	-0.41	-0.669	0	4	1	4	
						-0.09	0.49	0.49	0.49	0.49	0.49	0.08	-0.179	0.49	4.49	8	2	
							0.58	0.58	0.58	0.58	0.58	0.17	-0.089	0.58	4.58	8	1	
								0	0	0	0	-0.41	-0.669	0	4	1	2	
									0	0	0	-0.41	-0.669	0	4	1	2	
										0	0	-0.41	-0.669	0	4	1	2	
											0	-0.41	-0.669	0	4	1	2	
												-0.41	-0.669	0	4	1	2	
													-0.259	0.41	4.41	2	1	
														0.669	4.669	2	0	
															4	1	0	
																30	54	-24

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 24
p = < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated by the p value ($p<\alpha$) and the(-) sign of the S value.
Conclusion: A decreasing trend is present.

Notes:
1 Denotes detection limit value of a nondetect.



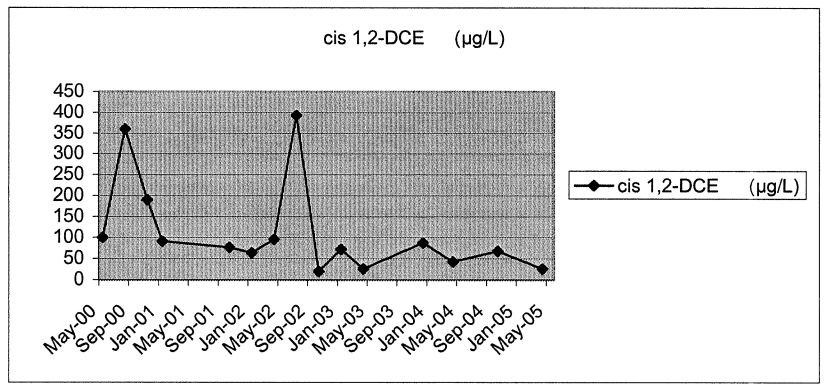
Monitoring Well C-14

DATE	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	100	360	190	91	77	64	95.8	393	20	72.2	26.2	87.6	42.4	67.3	26			
		260	90	-9	-23	-36	-4.2	293	-80	-27.8	-73.8	-12.4	-57.6	-32.7	-74	3	11	
			-170	-269	-283	-296	-264.2	33	-340	-287.8	-333.8	-272.4	-317.6	-292.7	-334	1	12	
				-99	-113	-126	-94.2	203	-170	-117.8	-163.8	-102.4	-147.6	-122.7	-164	1	11	
					-14	-27	4.8	302	-71	-18.8	-64.8	-3.4	-48.6	-23.7	-65	2	9	
						-13	18.8	316	-57	-4.8	-50.8	10.6	-34.6	-9.7	-51	3	7	
							31.8	329	-44	8.2	-37.8	23.6	-21.6	3.3	-38	5	4	
								297.2	-75.8	-23.6	-69.6	-8.2	-53.4	-28.5	-69.8	1	7	
									-373	-320.8	-366.8	-305.4	-350.6	-325.7	-367	0	7	
										52.2	6.2	67.6	22.4	47.3	6	6	0	
											-46	15.4	-29.8	-4.9	-46.2	1	4	
												61.4	16.2	41.1	-0.2	3	1	
													-45.2	-20.3	-61.6	0	3	
														24.9	-16.4	1	1	
															-41.3	0	1	
																27	78	-51

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 15
|S|= 51
p = < 0.0005
α = 0.05

Results indicate statistically significant decreasing cis-1,2-DCE concentration trend based on p level ($p<\alpha$) and (-) of S value. Concentrations are by far the highest in the 2 samples collected in the 3rd quarter (August 2000 and July 2002), suggesting a possible seasonal trend (though 4th quarter data are very different for the 3 years).

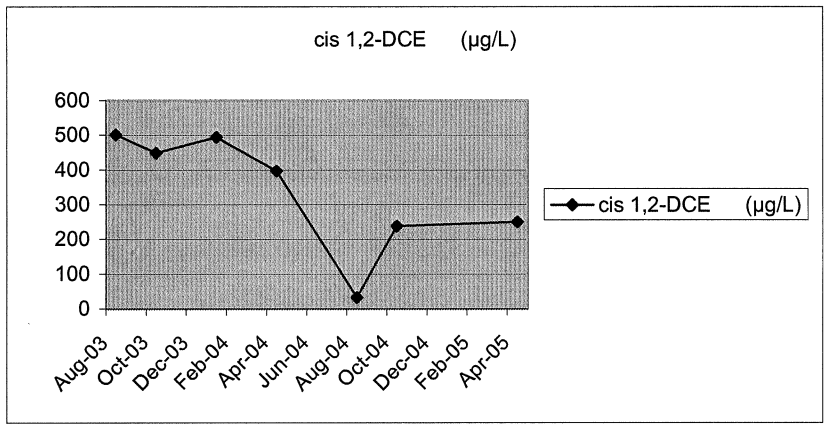
Conclusion: A decreasing trend may be present--marginal significance.



Monitoring Well C-15

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	501	449	494	397	32.3	238	250							
		-52	-7	-104	-468.7	-263	-251					0	6	
			45	-52	-416.7	-211	-199					1	4	
				-97	-461.7	-256	-244					0	4	
					-364.7	-159	-147					0	3	
						205.7	217.7					2	0	
							12					1	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												4	17	-13

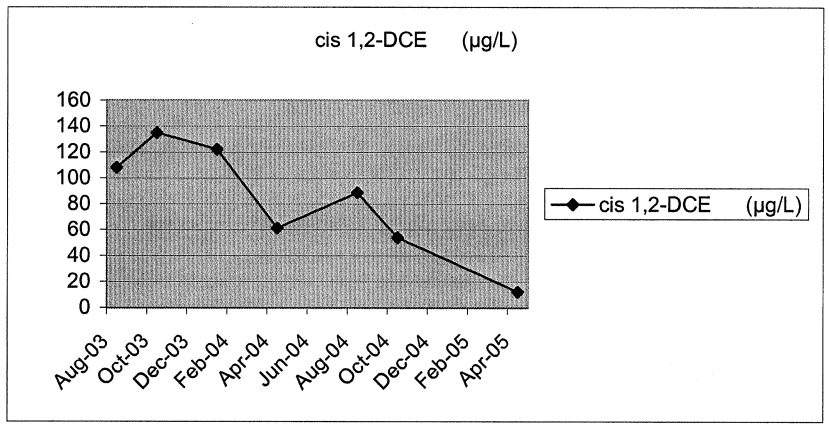
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 13
p = < 0.0005
α = 0.05
Results indicate a significant decreasing cis-1,2-DCE concentration trend ($p < \alpha$) and sign (-) of the S value.
Conclusion: A decreasing trend is present.



Monitoring Well C-16

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	108	135	122	61.3	88.7	53.9	12							
		27	14	-46.7	-19.3	-54.1	-96					2	4	
			-13	-73.7	-46.3	-81.1	-123					0	5	
				-60.7	-33.3	-68.1	-110					0	4	
					27.4	-7.4	-49.3					1	2	
						-34.8	-76.7					0	2	
							-41.9					0	1	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												3	18	-15

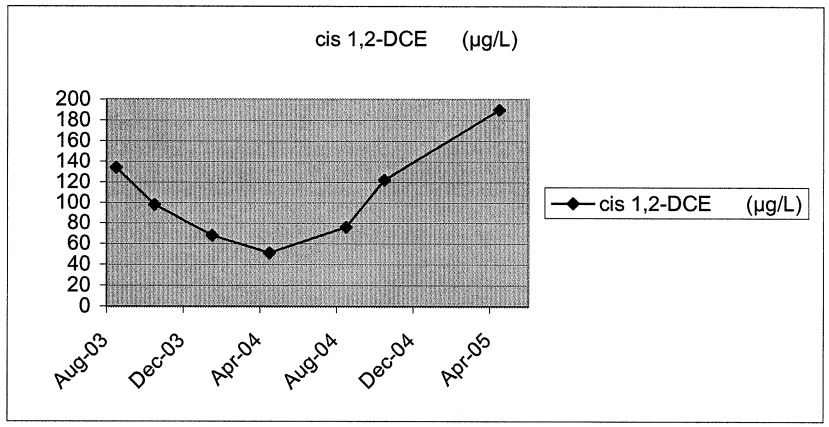
Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 15
p = < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on p level ($p>\alpha$) and sign (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-17

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	134	98	68.1	51.3	76	122	190							
		-36	-65.9	-82.7	-58	-12	56					1	5	
			-29.9	-46.7	-22	24	92					2	3	
				-16.8	7.9	53.9	121.9					3	1	
					24.7	70.7	138.7					3	0	
						46	114					2	0	
							68					1	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												12	9	3

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 3
p < 0.0005
α = 0.05
A statistically significant decreasing 1,1-DCE concentration trend is indicated based on the p level ($p<\alpha$) and (-) sign of the S value.
Conclusion: A decreasing trend is present.



Monitoring Well C-18

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	26.6	2.94	0.354	*1*	*1*	*1*	*1*							
		-23.66	-26.246	-25.6	-25.6	-25.6	-25.6					0	6	
			-2.586	-1.94	-1.94	-1.94	-1.94					0	5	
				0.646	0.646	0.646	0.646					4	0	
					0	0	0					0	0	
						0	0					0	0	
							0					0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												4	11	-7

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 7
p = 0.0003
α = 0.05

cis1,2-DCE was detected 3 of the 7 samples; however, there seem to be a decreasing trend present indicated based on the p level ($p<\alpha$) and (-) sign of the S value.

Conclusion: A decreasing trend may be present.

Monitoring Well C-19

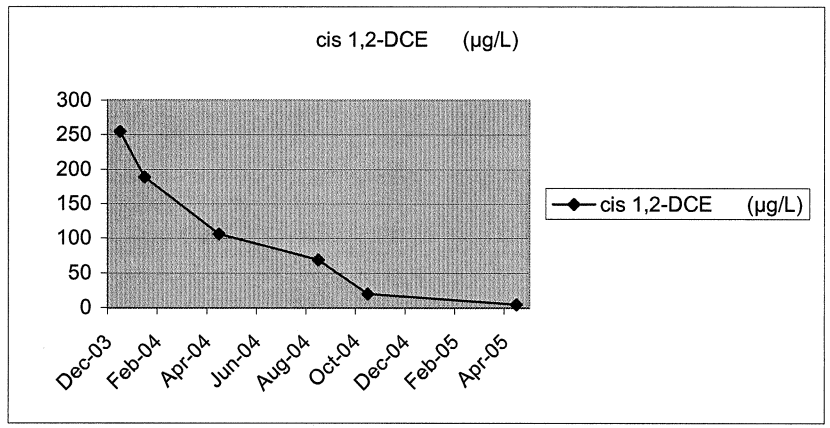
DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	*1*							
		0	0	0	0	0	0					0	0	
			0	0	0	0	0					0	0	
				0	0	0	0					0	0	
					0	0	0					0	0	
						0	0					0	0	
							0					0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	0

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 7
|S|= 0
p = *
α = 0.05
* cis 1,2-DCE was not detected in any of the 4 samples; therefore, a Kendall-Mann test is not necessary or appropriate.
Conclusion: No trend is discernible; all samples are nondetects.

Monitoring Well C-20

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	255	189	106	69	19.8	4.4								
		-66	-149	-186	-235.2	-250.6						0	5	
			-83	-120	-169.2	-184.6						0	4	
				-120	-169.2	-101.6						0	3	
					-49.2	-64.6						0	2	
						67.6						1	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												1	14	-13

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 6
|S|= 13
p = < 0.0005
α = 0.05
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on p level ($p>\alpha$) and sign (-) of the S value.
Conclusion: No trend is present.



Monitoring Well C-21

DATE	Dec-03	Jan-04	Apr-04	Apr-05						Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	*1*	*1*	*1*	*1*								
		0	0	0						0	0	
			0	0						0	0	
				0						0	0	
										0	0	
										0	0	
										0	0	
										0	0	
										0	0	
										0	0	
										0	0	
										0	0	
										0	0	
										0	0	0

Ho = No decreasing concentration trend is present.
H_1 = A decreasing concentration trend is present.
n = 3
|S|= 0
p = *
α = 0.05

* cis 1,2-DCE was not detected in any of the 2 samples; therefore, a Kendall-Mann test is not necessary or appropriate.

Conclusion: No trend is discernible; all samples are nondetects.

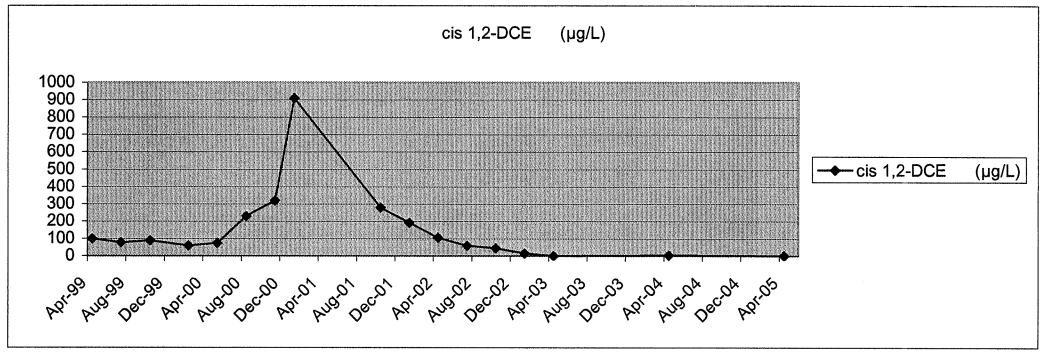
Monitoring Well MW-105

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	100	78	89	60	74	230	320	910	280	190	106	58.9	45	14	0.604	4.61	0.85			
		-22	-11	-40	-26	130	220	810	180	90	6	-41.1	-55	-86	-99.396	-95.39	-99.15	6	10	
			11	-18	-4	152	242	832	202	112	28	-19.1	-33	-64	-77.396	-73.39	-77.15	7	8	
				-29	-15	141	231	821	191	101	17	-30.1	-44	-75	-88.396	-84.39	-88.15	6	8	
					14	170	260	850	220	130	46	-1.1	-15	-46	-59.396	-55.39	-59.15	7	6	
						156	246	836	206	116	32	-15.1	-29	-60	-73.396	-69.39	-73.15	6	6	
							90	680	50	-40	-124	-171.1	-185	-216	-229.396	-225.39	-229.15	3	8	
								590	-40	-130	-214	-261.1	-275	-306	-319.396	-315.39	-319.15	1	9	
									-630	-720	-804	-851.1	-865	-896	-909.396	-905.39	-909.15	0	9	
										-90	-174	-221.1	-235	-266	-279.396	-275.39	-279.15	0	8	
											-84	-131.1	-145	-176	-189.396	-185.39	-189.15	0	7	
												-47.1	-61	-92	-105.396	-101.39	-105.15	0	6	
													-13.9	-44.9	-58.296	-54.29	-58.05	0	5	
														-31	-44.396	-40.39	-44.15	0	4	
															-13.396	-9.39	-13.15	0	3	
																4.006	0.246	2	0	
																	-3.76	0	1	
																		38	98	-60

Ho = No decreasing concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 60
p = 0.042
α = 0.1

A statistically significant decreasing cis-1,2-DCE concentration trend is indicated based on the p value ($p<\alpha$) and (-) of S value.

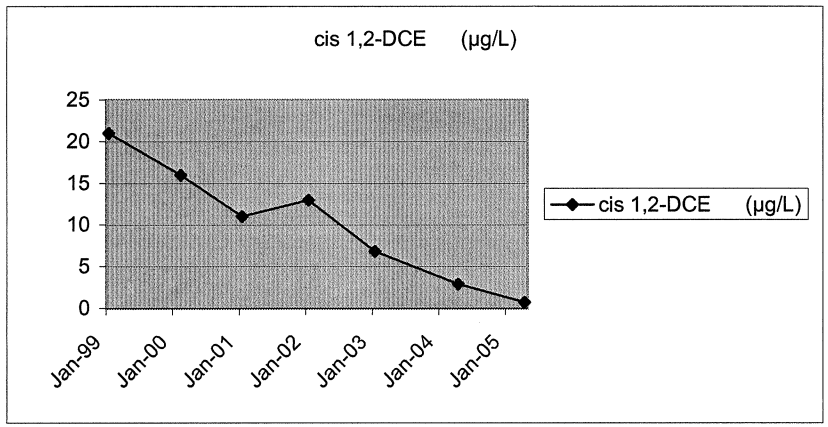
Conclusion: A decreasing trend is present. Notable trends exist within subsets of the data.



Monitoring Well MW-112

DATE	Jan-99	Feb-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05					Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	21	16	11	13	6.83	2.93	0.75							
		-5	-10	-8	-14.17	-18.07	-20.25					0	6	
			-5	-3	-9.17	-13.07	-15.25					0	5	
				2	-4.17	-8.07	-10.25					1	3	
					-6.17	-10.07	-12.25					0	3	
						-3.9	-6.08					0	2	
							-2.18					0	1	
												1	20	-19

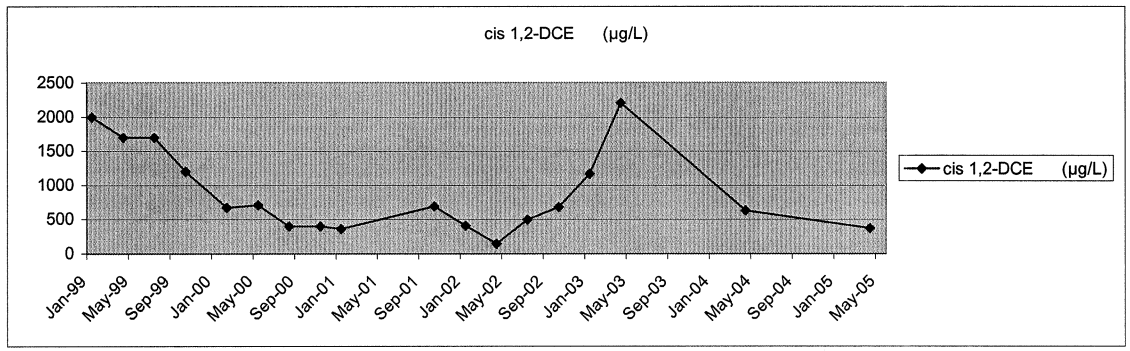
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 6
|S|= 19
p = 0.016
α = 0.1
A statistically significant decreasing cis-1,2-DCE concentration trend is indicated ($p<\alpha$) and the sign of the (-) S value.
Conclusion: A decreasing trend is present.



Monitoring Well MW-117

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	2000	1700	1700	1200	670	710	400	400	360	690	410	144	496	680	1170	2210	630	370			
		-300	-300	-800	-1330	-1290	-1600	-1600	-1640	-1310	-1590	-1856	-1504	-1320	-830	210	-1370	-1630	1	16	
			0	-500	-1030	-990	-1300	-1300	-1340	-1010	-1290	-1556	-1204	-1020	-530	510	-1070	-1330	1	14	
				-500	-1030	-990	-1300	-1300	-1340	-1010	-1290	-1556	-1204	-1020	-530	510	-1070	-1330	1	14	
					-530	-490	-800	-800	-840	-510	-790	-1056	-704	-520	-30	1010	-570	-830	1	13	
						40	-270	-270	-310	20	-260	-526	-174	10	500	1540	-40	-300	5	8	
							-310	-310	-350	-20	-300	-566	-214	-30	460	1500	-80	-340	2	10	
								0	-40	290	10	-256	96	280	770	1810	230	-30	7	3	
									-40	290	10	-256	96	280	770	1810	230	-30	7	3	
										330	50	-216	136	320	810	1850	270	10	8	1	
											-280	-546	-194	-10	480	1520	-60	-320	2	6	
												-266	86	270	760	1800	220	-40	5	2	
													352	536	1026	2066	486	226	6	0	
														184	674	1714	134	-126	4	1	
															490	1530	-50	-310	2	2	
																1040	-540	-800	1	2	
																	-1580	-1840	0	2	
																		-260	0	1	
																			53	98	-45

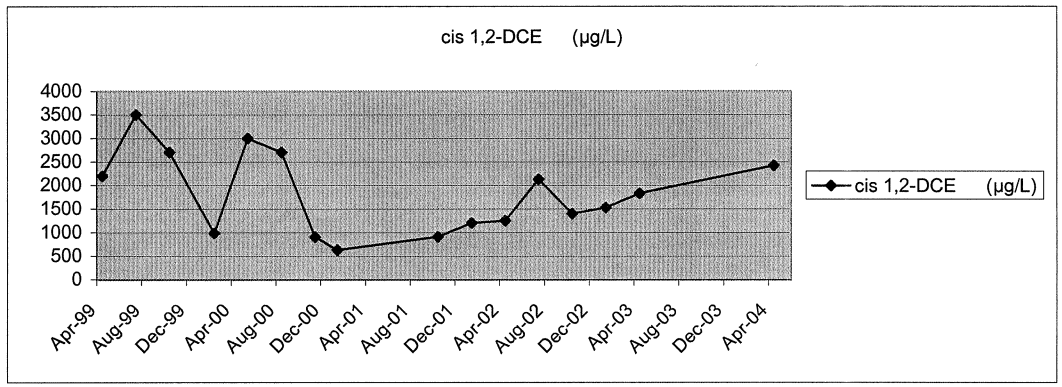
Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 18
|S|= 45
p = 0.245
α = 0.1
Results indicate no decreasing cis-1,2-DCE concentration trend based on p level ($p>\alpha$).
Conclusion: No decreasing trend is present.



Monitoring Well MW-120

DATE	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	2200	3500	2700	980	3000	2700	900	630	910	1200	1250	2130	1400	1530	1830	2420			
		1300	500	-1220	800	500	-1300	-1570	-1290	-1000	-950	-70	-800	-670	-370	220	5	10	
			-800	-2520	-500	-800	-2600	-2870	-2590	-2300	-2250	-1370	-2100	-1970	-1670	-1080	0	14	
				-1720	300	0	-1800	-2070	-1790	-1500	-1450	-570	-1300	-1170	-870	-280	1	11	
					2020	1720	-80	-350	-70	220	270	1150	420	550	850	1440	9	3	
						-300	-2100	-2370	-2090	-1800	-1750	-870	-1600	-1470	-1170	-580	0	11	
							-1800	-2070	-1790	-1500	-1450	-570	-1300	-1170	-870	-280	0	10	
								-270	10	300	350	1230	500	630	930	1520	8	1	
									280	570	620	1500	770	900	1200	1790	8	0	
										290	340	1220	490	620	920	1510	7	0	
											50	930	200	330	630	1220	6	0	
												880	150	280	580	1170	5	0	
													-730	-600	-300	290	1	3	
														130	430	1020	3	0	
															300	890	2	0	
																590	1	0	
																	56	63	-7

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 16
|S|= 7
p = 0.79
α = 0.1
Results indicate no cis-1,2-DCE concentration trend ($p>\alpha$). Conclusion: No trend is present.

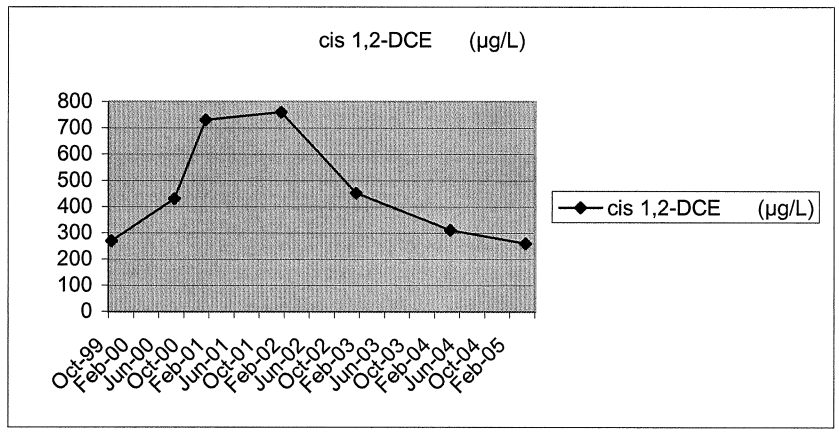


Monitoring Well MW-122A

DATE	Oct-99	Aug-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05					Positive Values	Negative Values	S
cis 1,2-DCE (µg/L)	270	430	730	760	453	311	260							
		160	460	490	183	41	-10					5	1	
			300	330	23	-119	-170					3	2	
				30	-277	-419	-470					1	3	
					-307	-449	-500					0	3	
						-142	-193					0	2	
							-51							
												9	11	-2

Ho = No concentration trend is present.
H_1 = A concentration trend is present (its direction is dependent upon the sign of S).
n = 6
|S|= 2
p = 0.72
α = 0.1

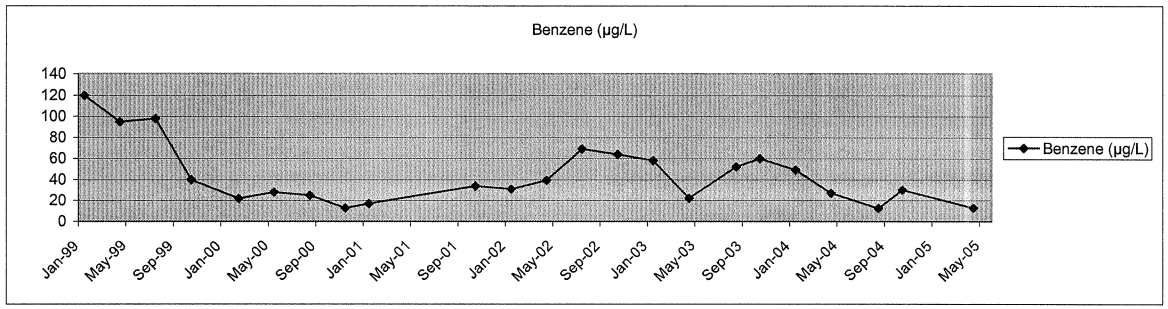
No statistically significant cis-1,2-DCE concentration trend is indicated by the p value ($p>\alpha$).
Conclusion: No trend is present.



Monitoring Well C-1

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	120	95	98	40	22	28	25	13	17	34	31	39.3	69.1	64	58.4	22.2	52.4	60	49.2	27	12.5	30	13			
		-25	-22	-80	-98	-92	-95	-107	-103	-86	-89	-80.7	-50.9	-56	-61.6	-97.8	-67.6	-60	-70.8	-93	-107.5	-90	-107	0	22	
			3	-55	-73	-67	-70	-82	-78	-61	-64	-55.7	-25.9	-31	-36.6	-72.8	-42.6	-35	-45.8	-68	-82.5	-65	-82	1	20	
				-58	-76	-70	-73	-85	-81	-64	-67	-58.7	-28.9	-34	-39.6	-75.8	-45.6	-38	-48.8	-71	-85.5	-68	-85	0	20	
					-18	-12	-15	-27	-23	-6	-9	-0.7	29.1	24	18.4	-17.8	12.4	20	9.2	-13	-27.5	-10	-27	6	13	
						6	3	-9	-5	12	9	17.3	47.1	42	36.4	0.2	30.4	38	27.2	5	-9.5	8	-9	14	4	
							-3	-15	-11	6	3	11.3	41.1	36	30.4	-5.8	24.4	32	21.2	-1	-15.5	2	-15	10	7	
								-12	-8	9	6	14.3	44.1	39	33.4	-2.8	27.4	35	24.2	2	-12.5	5	-12	11	5	
									4	21	18	26.3	56.1	51	45.4	9.2	39.4	47	36.2	14	-0.5	17	0	13	1	
										17	14	22.3	52.1	47	41.4	5.2	35.4	43	32.2	10	-4.5	13	-4	12	2	
											-3	5.3	35.1	30	24.4	-11.8	18.4	26	15.2	-7	-21.5	-4	-21	7	6	
												8.3	38.1	33	27.4	-8.8	21.4	29	18.2	-4	-18.5	-1	-18	7	5	
													29.8	24.7	19.1	-17.1	13.1	20.7	9.9	-12.3	-26.8	-9.3	-26.3	6	5	
														-5.1	-10.7	-46.9	-16.7	-9.1	-19.9	-42.1	-56.6	-39.1	-56.1	0	10	
															-5.6	-41.8	-11.6	-4	-14.8	-37	-51.5	-34	-51	0	9	
																-36.2	-6	1.6	-9.2	-31.4	-45.9	-28.4	-45.4	1	7	
																	30.2	37.8	27	4.8	-9.7	7.8	-9.2	5	2	
																		7.6	-3.2	-25.4	-39.9	-22.4	-39.4	1	5	
																			-10.8	-33	-47.5	-30	-47	0	5	
																				-22.2	-36.7	-19.2	-36.2	0	4	
																					-14.5	3	-14	1	2	
																						17.5	0.5	2	0	
																							-17	0	1	
																								96	113	-17

H_0= No concentration trend is present.
H_1= A concentration trend is present (its direction is dependent upon the sign of S).
n = 23
|S|= 17
p = < 0.0005
α = 0.1
Results indicate a statistically significant decreasing benzene concentration trend based on the p value (p>a) and sign (-) of the S value.
Conclusion: Decreasing trend is present.



Monitoring Well C-2A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	53	100	140	110	180	160	110	88	81	61	37.8	53.1	56	30.6	50.6	56.2	2.4			
		47	87	57	127	107	57	35	28	8	-15.2	0.1	3	-22.4	-2.4	3.2	-50.6	12	4	
			40	10	80	60	10	-12	-19	-39	-62.2	-46.9	-44	-69.4	-49.4	-43.8	-97.6	5	10	
				-30	40	20	-30	-52	-59	-79	-102.2	-86.9	-84	-109.4	-89.4	-83.8	-137.6	2	12	
					70	50	0	-22	-29	-49	-72.2	-56.9	-54	-79.4	-59.4	-53.8	-107.6	2	10	
						-20	-70	-92	-99	-119	-142.2	-126.9	-124	-149.4	-129.4	-123.8	-177.6	0	12	
							-50	-72	-79	-99	-122.2	-106.9	-104	-129.4	-109.4	-103.8	-157.6	0	11	
								-22	-29	-49	-72.2	-56.9	-54	-79.4	-59.4	-53.8	-107.6	0	10	
									-7	-27	-50.2	-34.9	-32	-57.4	-37.4	-31.8	-85.6	0	9	
										-20	-43.2	-27.9	-25	-50.4	-30.4	-24.8	-78.6	0	8	
											-23.2	-7.9	-5	-30.4	-10.4	-4.8	-58.6	0	7	
												15.3	18.2	-7.2	12.8	18.4	-35.4	4	2	
													2.9	-22.5	-2.5	3.1	-50.7	2	3	
														-25.4	-5.4	0.2	-53.6	1	3	
															20	25.6	-28.2	2	1	
																5.6	-48.2	1	1	
																	-53.8	0	1	
																		31	104	-73

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 16

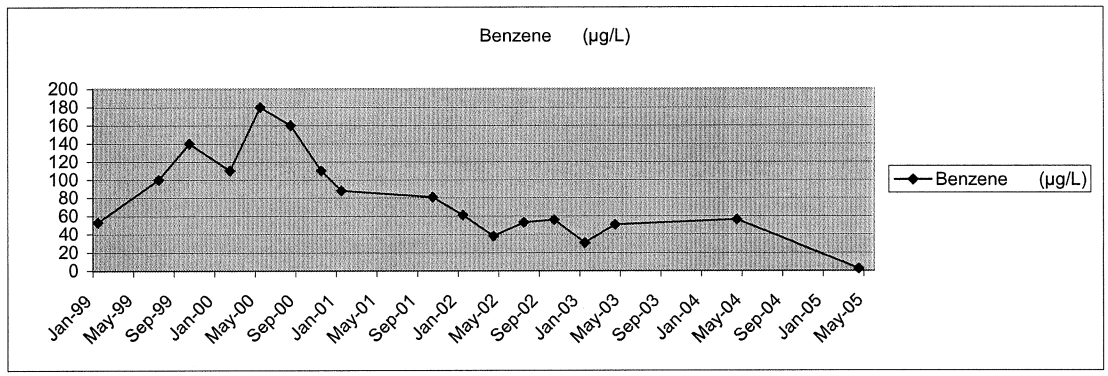
|S|= 73

p = 0.01

α = 0.1

Results indicate a statistically significant decreasing benzene concentration trend based on the p value (p<a) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well C-3A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	12	13	41	41	54	110	120	190	120	130	79	43.5	72.8	60	33.2	27.9	123	172	108	160			
		1	29	29	42	98	108	178	108	118	67	31.5	60.8	48	21.2	15.9	111	160	96	148	19	0	
			28	28	41	97	107	177	107	117	66	30.5	59.8	47	20.2	14.9	110	159	95	147	18	0	
				0	13	69	79	149	79	89	38	2.5	31.8	19	-7.8	-13.1	82	131	67	119	14	2	
					13	69	79	149	79	89	38	2.5	31.8	19	-7.8	-13.1	82	131	67	119	14	2	
						56	66	136	66	76	25	-10.5	18.8	6	-20.8	-26.1	69	118	54	106	12	3	
							10	80	10	20	-31	-66.5	-37.2	-50	-76.8	-82.1	13	62	-2	50	7	7	
								70	0	10	-41	-76.5	-47.2	-60	-86.8	-92.1	3	52	-12	40	5	7	
									-70	-60	-111	-146.5	-117.2	-130	-156.8	-162.1	-67	-18	-82	-30	0	12	
										10	-41	-76.5	-47.2	-60	-86.8	-92.1	3	52	-12	40	4	7	
											-51	-86.5	-57.2	-70	-96.8	-102.1	-7	42	-22	30	2	8	
												-35.5	-6.2	-19	-45.8	-51.1	44	93	29	81	4	5	
													29.3	16.5	-10.3	-15.6	79.5	128.5	64.5	116.5	6	2	
														-12.8	-39.6	-44.9	50.2	99.2	35.2	87.2	4	3	
															-26.8	-32.1	63	112	48	100	4	2	
																-5.3	89.8	138.8	74.8	126.8	4	1	
																	95.1	144.1	80.1	132.1	4	0	
																		49	-15	37	2	1	
																			-64	-12	0	2	
																				52	1	0	
																					87	64	23

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 20

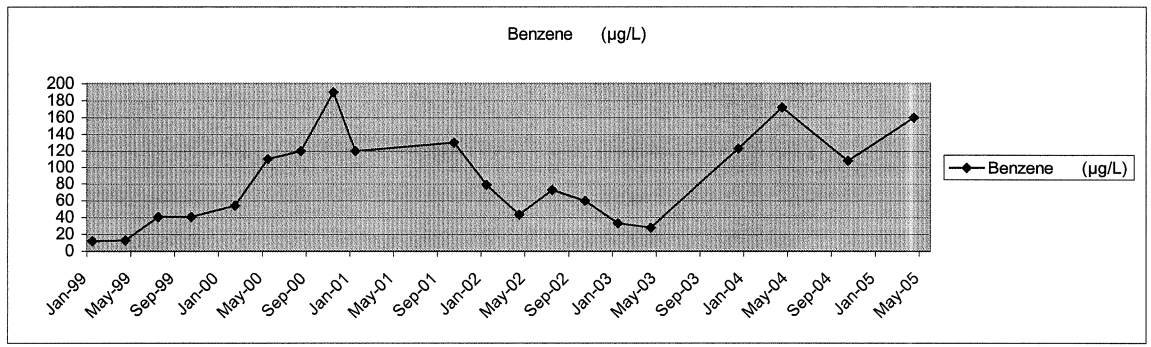
|S|= 23

p = < 0.0005

α = 0.1

A statistically significant increasing benzene concentration trend is indicated based on the p value ($p>\alpha$) and sign (+) of the S value.

Conclusion: Increasing trend is present.



Monitoring Well C-4A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	140	110	97	59	51	58	44	43	42	39	32	48.6	43.3	40	38.5	38.1	47.7	44			
		-30	-43	-81	-89	-82	-96	-97	-98	-101	-108	-91.4	-96.7	-100	-101.5	-101.9	-92.3	-96	0	17	
			-13	-51	-59	-52	-66	-67	-68	-71	-78	-61.4	-66.7	-70	-71.5	-71.9	-62.3	-66	0	16	
				-38	-46	-39	-53	-54	-55	-58	-65	-48.4	-53.7	-57	-58.5	-58.9	-49.3	-53	0	15	
					-8	-1	-15	-16	-17	-20	-27	-10.4	-15.7	-19	-20.5	-20.9	-11.3	-15	0	14	
						7	-7	-8	-9	-12	-19	-2.4	-7.7	-11	-12.5	-12.9	-3.3	-7	1	12	
							-14	-15	-16	-19	-26	-9.4	-14.7	-18	-19.5	-19.9	-10.3	-14	0	12	
								-1	-2	-5	-12	4.6	-0.7	-4	-5.5	-5.9	3.7	0	2	8	
									-1	-4	-11	5.6	0.3	-3	-4.5	-4.9	4.7	1	4	6	
										-3	-10	6.6	1.3	-2	-3.5	-3.9	5.7	2	4	5	
											-7	9.6	4.3	1	-0.5	-0.9	8.7	5	5	3	
												16.6	11.3	8	6.5	6.1	15.7	12	7	0	
													-5.3	-8.6	-10.1	-10.5	-0.9	-4.6	0	6	
														-3.3	-4.8	-5.2	4.4	0.7	2	3	
															-1.5	-1.9	7.7	4	2	2	
																-0.4	9.2	5.5	2	1	
																	9.6	5.9	2	0	
																		-3.7	0	1	
																			31	121	-90

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

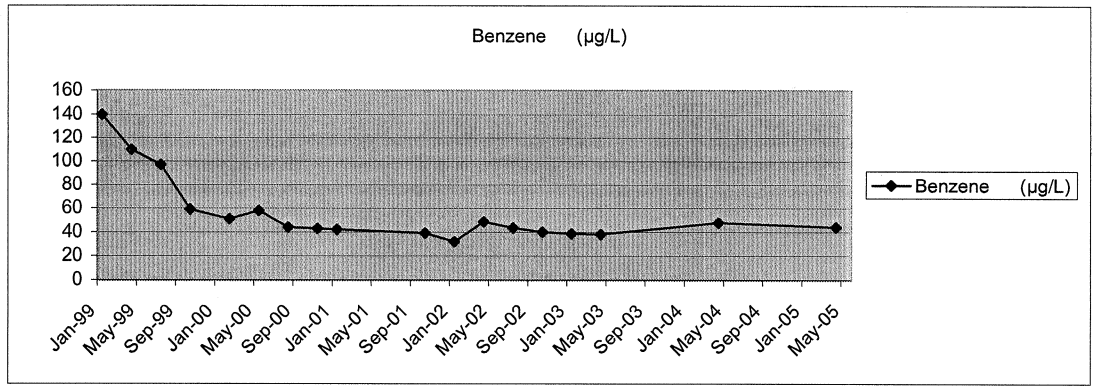
|S|= 90

p < 0.001

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well C-5A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	56	78	66	56	47	44	45	47	55	72	63	62.5	63.9	47	34.1	46.1	37	40	40.4	46			
		22	10	0	-9	-12	-11	-9	-1	16	7	6.5	7.9	-9	-21.9	-9.9	-19	-16	-15.6	-10	6	12	
			-12	-22	-31	-34	-33	-31	-23	-6	-15	-15.5	-14.1	-31	-43.9	-31.9	-41	-38	-37.6	-32	0	18	
				-10	-19	-22	-21	-19	-11	6	-3	-3.5	-2.1	-19	-31.9	-19.9	-29	-26	-25.6	-20	1	16	
					-9	-12	-11	-9	-1	16	7	6.5	7.9	-9	-21.9	-9.9	-19	-16	-15.6	-10	4	12	
						-3	-2	0	8	25	16	15.5	16.9	0	-12.9	-0.9	-10	-7	-6.6	-1	5	8	
							1	3	11	28	19	18.5	19.9	3	-9.9	2.1	-7	-4	-3.6	2	10	4	
								2	10	27	18	17.5	18.9	2	-10.9	1.1	-8	-5	-4.6	1	9	4	
									8	25	16	15.5	16.9	0	-12.9	-0.9	-10	-7	-6.6	-1	5	6	
										17	8	7.5	8.9	-8	-20.9	-8.9	-18	-15	-14.6	-9	4	7	
											-9	-9.5	-8.1	-25	-37.9	-25.9	-35	-32	-31.6	-26	0	10	
												-0.5	0.9	-16	-28.9	-16.9	-26	-23	-22.6	-17	1	8	
													1.4	-15.5	-28.4	-16.4	-25.5	-22.5	-22.1	-16.5	1	7	
														-16.9	-29.8	-17.8	-26.9	-23.9	-23.5	-17.9	0	7	
															-12.9	-0.9	-10	-7	-6.6	-1	0	6	
																12	2.9	5.9	6.3	11.9	5	0	
																	-9.1	-6.1	-5.7	-0.1	0	4	
																		3	3.4	9	3	0	
																			0.4	6	2	0	
																				5.6	1	0	
																					51	99	-48

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 20

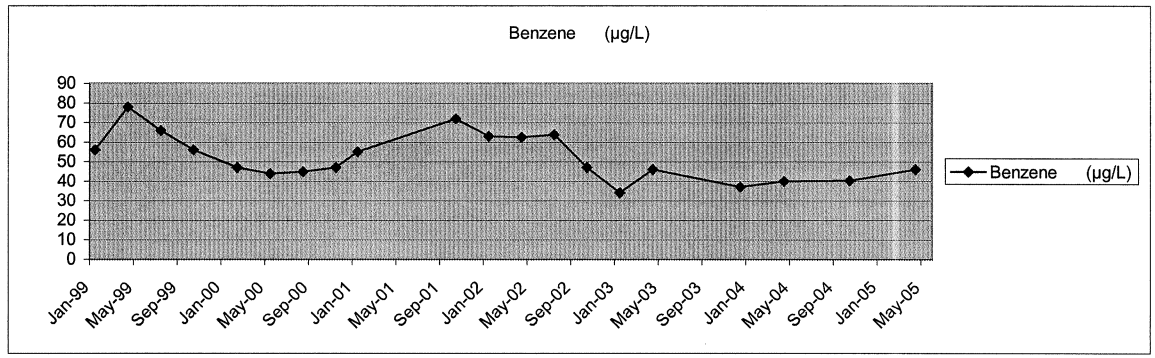
|S|= 48

p = < 0.0005

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well C-5B

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	110	94	100	76	39	48	32	20	22	21	18	21.2	22.9	23	24.9	27.3	26.3	22			
		-16	-10	-34	-71	-62	-78	-90	-88	-89	-92	-88.8	-87.1	-87	-85.1	-82.7	-83.7	-88	0	17	
			6	-18	-55	-46	-62	-74	-72	-73	-76	-72.8	-71.1	-71	-69.1	-66.7	-67.7	-72	1	15	
				-24	-61	-52	-68	-80	-78	-79	-82	-78.8	-77.1	-77	-75.1	-72.7	-73.7	-78	0	15	
					-37	-28	-44	-56	-54	-55	-58	-54.8	-53.1	-53	-51.1	-48.7	-49.7	-54	0	14	
						9	-7	-19	-17	-18	-21	-17.8	-16.1	-16	-14.1	-11.7	-12.7	-17	1	12	
							-16	-28	-26	-27	-30	-26.8	-25.1	-25	-23.1	-20.7	-21.7	-26	0	12	
								-12	-10	-11	-14	-10.8	-9.1	-9	-7.1	-4.7	-5.7	-10	0	11	
									2	1	-2	1.2	2.9	3	4.9	7.3	6.3	2	9	1	
										-1	-4	-0.8	0.9	1	2.9	5.3	4.3	0	5	3	
											-3	0.2	1.9	2	3.9	6.3	5.3	1	7	1	
												3.2	4.9	5	6.9	9.3	8.3	4	7	0	
													1.7	1.8	3.7	6.1	5.1	0.8	6	0	
														0.1	2	4.4	3.4	-0.9	4	1	
															1.9	4.3	3.3	-1	3	1	
																2.4	1.4	-2.9	2	1	
																	-1	-5.3	0	2	
																		-4.3	0	1	
																			45	107	-62

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

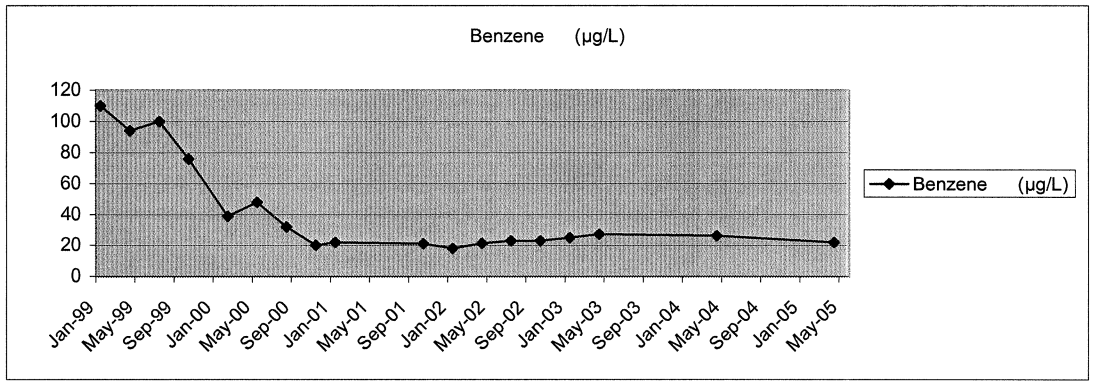
|S|= 62

p = 0.028

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well C-5C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	*1*	1.4	6.3	5.6	4.4	3.9	2.3	1.8	0.95	0.4	0.53	0.666	1.32	1.1	0.515	1.18	0.303	*1*			
		0.4	5.3	4.6	3.4	2.9	1.3	0.8	-0.05	-0.6	-0.47	-0.334	0.32	0.1	-0.485	0.18	-0.697	0	10	6	
			4.9	4.2	3	2.5	0.9	0.4	-0.45	-1	-0.87	-0.734	-0.08	-0.3	-0.885	-0.22	-1.097	-0.4	6	10	
				-0.7	-1.9	-2.4	-4	-4.5	-5.35	-5.9	-5.77	-5.634	-4.98	-5.2	-5.785	-5.12	-5.997	-5.3	0	15	
					-1.2	-1.7	-3.3	-3.8	-4.65	-5.2	-5.07	-4.934	-4.28	-4.5	-5.085	-4.42	-5.297	-4.6	0	14	
						-0.5	-2.1	-2.6	-3.45	-4	-3.87	-3.734	-3.08	-3.3	-3.885	-3.22	-4.097	-3.4	0	13	
							-1.6	-2.1	-2.95	-3.5	-3.37	-3.234	-2.58	-2.8	-3.385	-2.72	-3.597	-2.9	0	12	
								-0.5	-1.35	-1.9	-1.77	-1.634	-0.98	-1.2	-1.785	-1.12	-1.997	-1.3	0	11	
									-0.85	-1.4	-1.27	-1.134	-0.48	-0.7	-1.285	-0.62	-1.497	-0.8	0	10	
										-0.55	-0.42	-0.284	0.37	0.15	-0.435	0.23	-0.647	0.05	4	5	
											0.13	0.266	0.92	0.7	0.115	0.78	-0.097	0.6	7	1	
												0.136	0.79	0.57	-0.015	0.65	-0.227	0.47	5	2	
													0.654	0.434	-0.151	0.514	-0.363	0.334	4	2	
														-0.22	-0.805	-0.14	-1.017	-0.32	0	5	
															-0.585	0.08	-0.797	-0.1	1	3	
																0.665	-0.212	0.485	2	1	
																	-0.877	-0.18	0	2	
																		0.697	1	0	
																			40	112	-72

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

|S|= 72

p = 0.004

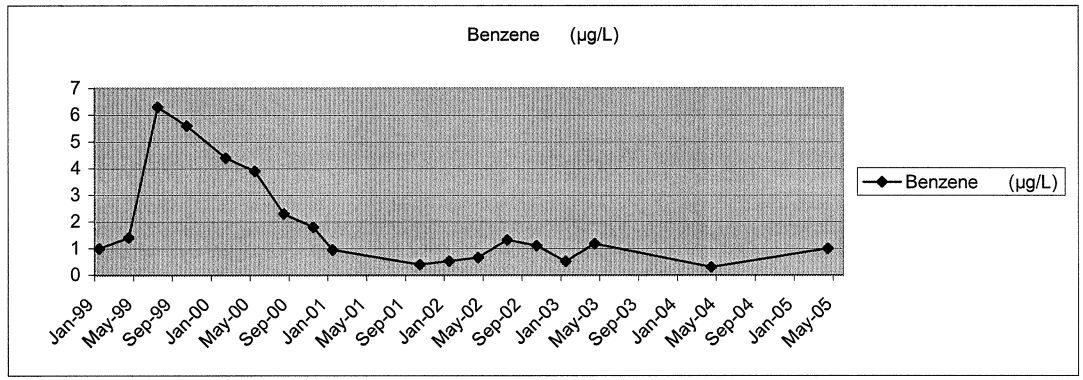
α = 0.1

Results indicate a statistically significant decreasing benzene concentration trend based on the p value (p<a)and the sign (-) of the S value.

Conclusion: A deceasing trend is present.

Notes:

1 Denotes detection limit value of a nondetect.



Monitoring Well C-7A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	97	75	82	49	30	30	33	14	13	19	19.2	13.7	8.7	9.94	12.7	19.6	15.9	18.2	10			
		-22	-15	-48	-67	-67	-64	-83	-84	-78	-77.8	-83.3	-88.3	-87.06	-84.3	-77.4	-81.1	-78.8	-87	0	18	
			7	-26	-45	-45	-42	-61	-62	-56	-55.8	-61.3	-66.3	-65.06	-62.3	-55.4	-59.1	-56.8	-65	1	16	
				-33	-52	-52	-49	-68	-69	-63	-62.8	-68.3	-73.3	-72.06	-69.3	-62.4	-66.1	-63.8	-72	0	16	
					-19	-19	-16	-35	-36	-30	-29.8	-35.3	-40.3	-39.06	-36.3	-29.4	-33.1	-30.8	-39	0	15	
						0	3	-16	-17	-11	-10.8	-16.3	-21.3	-20.06	-17.3	-10.4	-14.1	-11.8	-20	1	12	
							3	-16	-17	-11	-10.8	-16.3	-21.3	-20.06	-17.3	-10.4	-14.1	-11.8	-20	1	12	
								-19	-20	-14	-13.8	-19.3	-24.3	-23.06	-20.3	-13.4	-17.1	-14.8	-23	0	12	
									-1	5	5.2	-0.3	-5.3	-4.06	-1.3	5.6	1.9	4.2	-4	5	6	
										6	6.2	0.7	-4.3	-3.06	-0.3	6.6	2.9	5.2	-3	6	4	
											0.2	-5.3	-10.3	-9.06	-6.3	0.6	-3.1	-0.8	-9	2	7	
												-5.5	-10.5	-9.26	-6.5	0.4	-3.3	-1	-9.2	1	7	
													-5	-3.76	-1	5.9	2.2	4.5	-3.7	3	4	
														1.24	4	10.9	7.2	9.5	1.3	6	0	
															2.76	9.66	5.96	8.26	0.06	5	0	
																6.9	3.2	5.5	-2.7	3	1	
																	-3.7	-1.4	-9.6	0	3	
																		2.3	-5.9	1	1	
																			-8.2	0	1	
																				34	101	-67

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 19

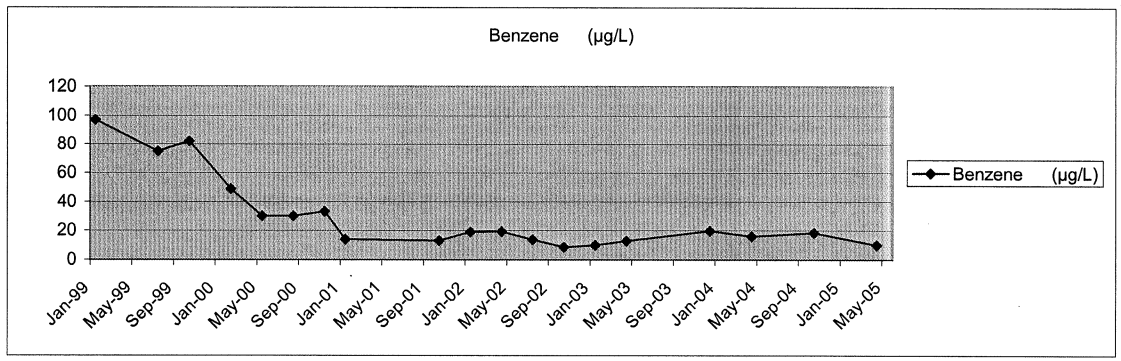
|S|= 67

p = < 0.0005

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well C-8A

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	***500***	34	29	29	29	29	43	39	23	23	14.9	14.3	25	45.3	23.4	24.8	17			
			-5	-5	-5	-5	9	5	-11	-11	-19.1	-19.7	-9	11.3	-10.6	-9.2	-17	3	12	
				0	0	0	14	10	-6	-6	-14.1	-14.7	-4	16.3	-5.6	-4.2	-12	3	8	
					0	0	14	10	-6	-6	-14.1	-14.7	-4	16.3	-5.6	-4.2	-12	3	8	
						0	14	10	-6	-6	-14.1	-14.7	-4	16.3	-5.6	-4.2	-12	3	8	
							14	10	-6	-6	-14.1	-14.7	-4	16.3	-5.6	-4.2	-12	3	8	
								-4	-20	-20	-28.1	-28.7	-18	2.3	-19.6	-18.2	-26	1	9	
									-16	-16	-24.1	-24.7	-14	6.3	-15.6	-14.2	-22	1	8	
										0	-8.1	-8.7	2	22.3	0.4	1.8	-6	4	3	
											-8.1	-8.7	2	22.3	0.4	1.8	-6	4	3	
												-0.6	10.1	30.4	8.5	9.9	2.1	5	1	
													10.7	31	9.1	10.5	2.7	5	0	
														20.3	-1.6	-0.2	-8	1	3	
															-21.9	-20.5	-28.3	0	3	
																1.4	-6.4	1	1	
																	-7.8	0	1	
																		37	76	-39

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 16

|S|= 39

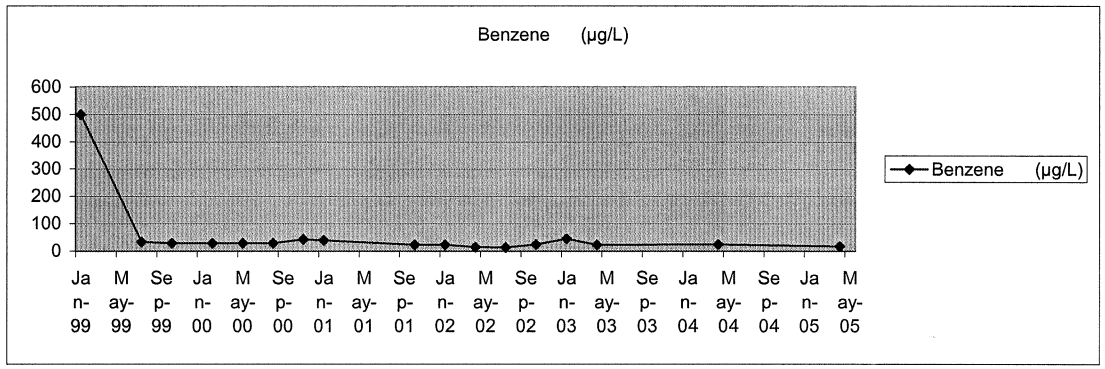
p = 0.228

α = 0.1

No statistically significant benzene concentration trend is indicated based on the p value (p>a). The high nondetected January 1999 value was not used in the evaluation because it is far greater than all detections and may artificially affect the Mann-Kendall analysis. Conclusion: No trend is present.

Notes:

500 Denotes detection limit value of a nondetect.



Monitoring Well C-9A

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	45	20	37	27	22	25	23	24	24	15	17	11.9	12.7	18	26.7	31	20.5	33.7	24.4	17			
		-25	-8	-18	-23	-20	-22	-21	-21	-30	-28	-33.1	-32.3	-27	-18.3	-14	-24.5	-11.3	-20.6	-28	0	19	
			17	7	2	5	3	4	4	-5	-3	-8.1	-7.3	-2	6.7	11	0.5	13.7	4.4	-3	12	6	
				-10	-15	-12	-14	-13	-13	-22	-20	-25.1	-24.3	-19	-10.3	-6	-16.5	-3.3	-12.6	-20	0	17	
					-5	-2	-4	-3	-3	-12	-10	-15.1	-14.3	-9	-0.3	4	-6.5	6.7	-2.6	-10	2	14	
						3	1	2	2	-7	-5	-10.1	-9.3	-4	4.7	9	-1.5	11.7	2.4	-5	8	7	
							-2	-1	-1	-10	-8	-13.1	-12.3	-7	1.7	6	-4.5	8.7	-0.6	-8	3	11	
								1	1	-8	-6	-11.1	-10.3	-5	3.7	8	-2.5	10.7	1.4	-6	6	7	
									0	-9	-7	-12.1	-11.3	-6	2.7	7	-3.5	9.7	0.4	-7	4	7	
										-9	-7	-12.1	-11.3	-6	2.7	7	-3.5	9.7	0.4	-7	4	7	
											2	-3.1	-2.3	3	11.7	16	5.5	18.7	9.4	2	8	2	
												-5.1	-4.3	1	9.7	14	3.5	16.7	7.4	0	6	2	
													0.8	6.1	14.8	19.1	8.6	21.8	12.5	5.1	8	0	
														5.3	14	18.3	7.8	21	11.7	4.3	7	0	
															8.7	13	2.5	15.7	6.4	-1	5	1	
																4.3	-6.2	7	-2.3	-9.7	2	3	
																	-10.5	2.7	-6.6	-14	1	3	
																		13.2	3.9	-3.5	2	1	
																			-9.3	-16.7	0	2	
																				-7.4	0	1	
																					66	85	-19

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 20

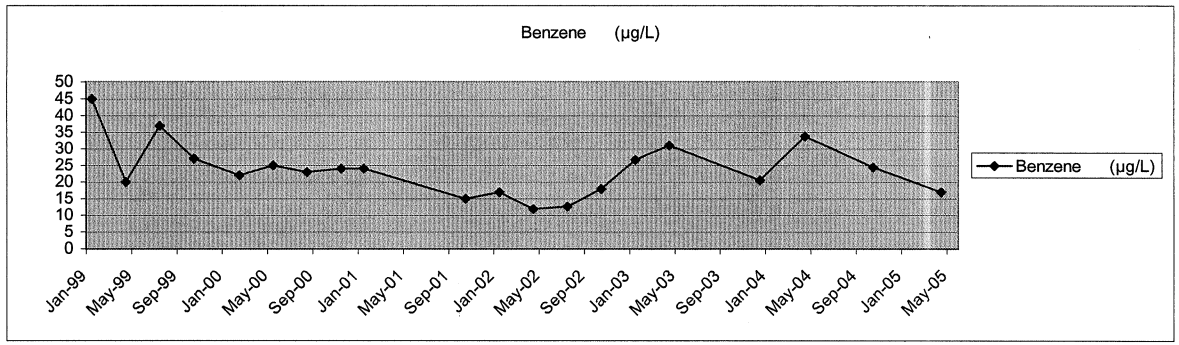
|S|= 19

p = < 0.0005

α = 0.1

Results indicate a statistically significant decreasing benzene concentration trend based on the p value (p<a) and sign(-) of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-9B

DATE	Jan-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	69	32	16	13	19	15	14	16	11	11	8.72	9.81	17	27.5	30.8	15.8	12			
		-37	-53	-56	-50	-54	-55	-53	-58	-58	-60.28	-59.19	-52	-41.5	-38.2	-53.2	-57	0	16	
			-16	-19	-13	-17	-18	-16	-21	-21	-23.28	-22.19	-15	-4.5	-1.2	-16.2	-20	0	15	
				-3	3	-1	-2	0	-5	-5	-7.28	-6.19	1	11.5	14.8	-0.2	-4	4	9	
					6	2	1	3	-2	-2	-4.28	-3.19	4	14.5	17.8	2.8	-1	8	5	
						-4	-5	-3	-8	-8	-10.28	-9.19	-2	8.5	11.8	-3.2	-7	2	10	
							-1	1	-4	-4	-6.28	-5.19	2	12.5	15.8	0.8	-3	5	6	
								2	-3	-3	-5.28	-4.19	3	13.5	16.8	1.8	-2	5	5	
									-5	-5	-7.28	-6.19	1	11.5	14.8	-0.2	-4	3	6	
										0	-2.28	-1.19	6	16.5	19.8	4.8	1	5	2	
											-2.28	-1.19	6	16.5	19.8	4.8	1	5	2	
												1.09	8.28	18.78	22.08	7.08	3.28	6	0	
													7.19	17.69	20.99	5.99	2.19	5	0	
														10.5	13.8	-1.2	-5	2	2	
															3.3	-11.7	-15.5	1	2	
																-15	-18.8	0	2	
																	-3.8	0	1	
																		51	83	-32

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 16

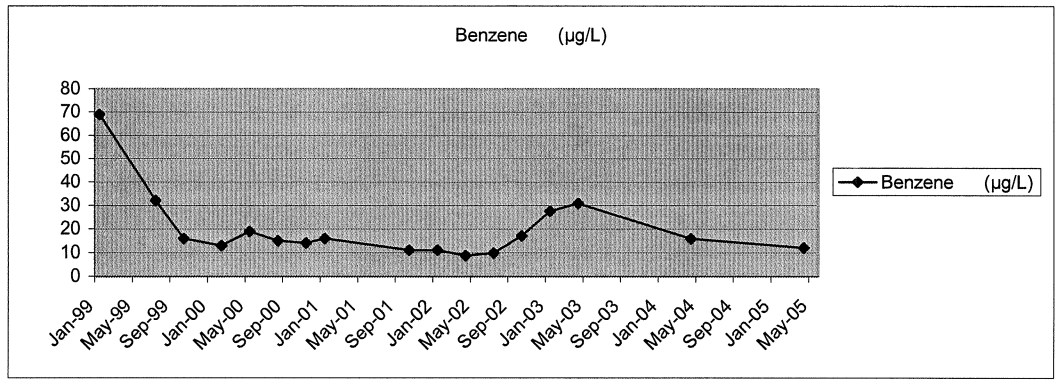
|S|= 32

p = 0.306

α = 0.1

Results indicate no statistically significant benzene concentration trend based on the p value (p>a).

Conclusion: No trend is present.



Monitoring Well C-9C

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	1.7	1.6	1.3	1.6	0.69	***1***	0.5	***1***	0.59	0.32	0.39	0.537	0.648	0.91	1.73	2.17	0.274	0.51			
		-0.1	-0.4	-0.1	-1.01	-0.7	-1.2	-0.7	-1.11	-1.38	-1.31	-1.163	-1.052	-0.79	0.03	0.47	-1.426	-1.19	2	15	
			-0.3	0	-0.91	-0.6	-1.1	-0.6	-1.01	-1.28	-1.21	-1.063	-0.952	-0.69	0.13	0.57	-1.326	-1.09	2	13	
				0.3	-0.61	-0.3	-0.8	-0.3	-0.71	-0.98	-0.91	-0.763	-0.652	-0.39	0.43	0.87	-1.026	-0.79	3	12	
					-0.91	-0.6	-1.1	-0.6	-1.01	-1.28	-1.21	-1.063	-0.952	-0.69	0.13	0.57	-1.326	-1.09	2	12	
						0.31	-0.19	0.31	-0.1	-0.37	-0.3	-0.153	-0.042	0.22	1.04	1.48	-0.416	-0.18	5	8	
							-0.5	0	-0.41	-0.68	-0.61	-0.463	-0.352	-0.09	0.73	1.17	-0.726	-0.49	2	9	
								0.5	0.09	-0.18	-0.11	0.037	0.148	0.41	1.23	1.67	-0.226	0.01	8	3	
									-0.41	-0.68	-0.61	-0.463	-0.352	-0.09	0.73	1.17	-0.726	-0.49	2	8	
										-0.27	-0.2	-0.053	0.058	0.32	1.14	1.58	-0.316	-0.08	4	5	
											0.07	0.217	0.328	0.59	1.41	1.85	-0.046	0.19	7	1	
												0.147	0.258	0.52	1.34	1.78	-0.116	0.12	6	1	
													0.111	0.373	1.193	1.633	-0.263	-0.027	4	2	
														0.262	1.082	1.522	-0.374	-0.138	3	2	
															0.82	1.26	-0.636	-0.4	2	2	
																0.44	-1.456	-1.22	1	2	
																	-1.896	-1.66	0	2	
																		0.236	1	0	
																			54	97	-43

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

|S|= 43

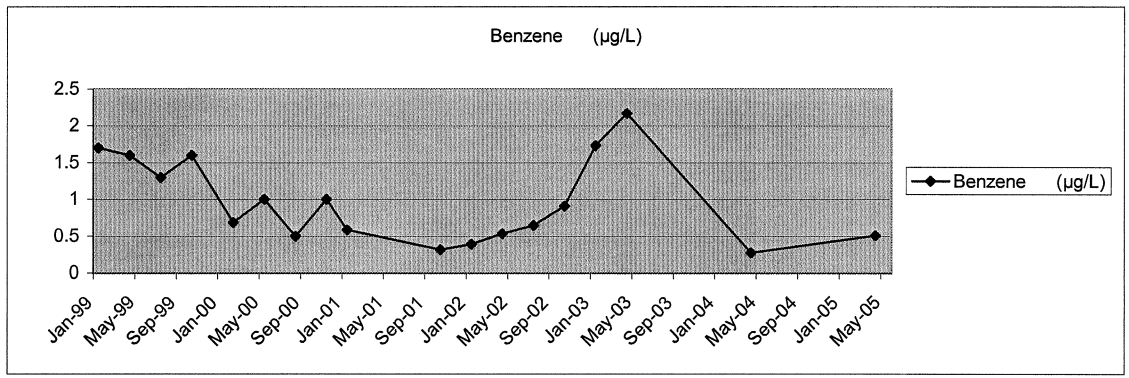
p = 0.176

α = 0.1

A marginally statistically significant decreasing benzene concentration trend is indicated based on the p value (p approximates a) and the (-) sign of the S value.
Qualitiatively no overall trend is apparent.
Conclusion: No trend is present.

Notes:

1 Denotes detection limit value of a nondetect.



Monitoring Well C-10

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	19	10	17	13	8.3	6.8	6.8	6.1	9.2	20	34	33.9	33.7	32	35.1	21.9	60	31.4	32.3	21			
		-9	-2	-6	-10.7	-12.2	-12.2	-12.9	-9.8	1	15	14.9	14.7	13	16.1	2.9	41	12.4	13.3	2	11	8	
			7	3	-1.7	-3.2	-3.2	-3.9	-0.8	10	24	23.9	23.7	22	25.1	11.9	50	21.4	22.3	11	13	5	
				-4	-8.7	-10.2	-10.2	-10.9	-7.8	3	17	16.9	16.7	15	18.1	4.9	43	14.4	15.3	4	11	6	
					-4.7	-6.2	-6.2	-6.9	-3.8	7	21	20.9	20.7	19	22.1	8.9	47	18.4	19.3	8	11	5	
						-1.5	-1.5	-2.2	0.9	11.7	25.7	25.6	25.4	23.7	26.8	13.6	51.7	23.1	24	12.7	12	3	
							0	-0.7	2.4	13.2	27.2	27.1	26.9	25.2	28.3	15.1	53.2	24.6	25.5	14.2	12	1	
								-0.7	2.4	13.2	27.2	27.1	26.9	25.2	28.3	15.1	53.2	24.6	25.5	14.2	12	1	
									3.1	13.9	27.9	27.8	27.6	25.9	29	15.8	53.9	25.3	26.2	14.9	12	0	
										10.8	24.8	24.7	24.5	22.8	25.9	12.7	50.8	22.2	23.1	11.8	11	0	
											14	13.9	13.7	12	15.1	1.9	40	11.4	12.3	1	10	0	
												-0.1	-0.3	-2	1.1	-12.1	26	-2.6	-1.7	-13	2	7	
													-0.2	-1.9	1.2	-12	26.1	-2.5	-1.6	-12.9	2	6	
														-1.7	1.4	-11.8	26.3	-2.3	-1.4	-12.7	2	5	
															3.1	-10.1	28	-0.6	0.3	-11	3	3	
																-13.2	24.9	-3.7	-2.8	-14.1	1	4	
																	38.1	9.5	10.4	-0.9	3	1	
																		-28.6	-27.7	-39	0	3	
																			0.9	-10.4	1	1	
																				-11.3	0	1	
																					105	47	58

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 20

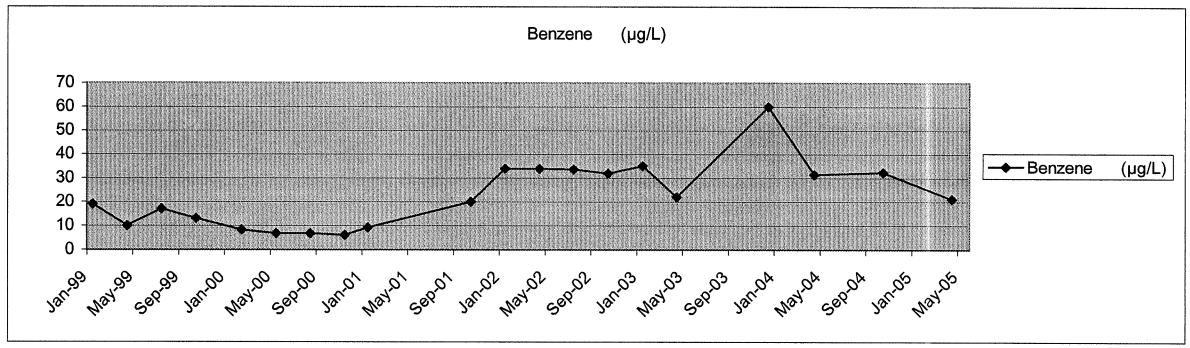
|S|= 58

p = < 0.0005

α = 0.1

A statistically significant increasing benzene concentration trend is indicated based on the p value (p<a) and the (+) sign of the S value.

Conclusion: An increasing trend is present.



Monitoring Well C-11

DATE	Jan-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	31	28	23	15	19	15	14	16.6	22.1	9.7	9.43	11.5	17.7	22.3	19.8	13			
		-3	-8	-16	-12	-16	-17	-14.4	-8.9	-21.3	-21.57	-19.5	-13.3	-8.7	-11.2	-18	0	15	
			-5	-13	-9	-13	-14	-11.4	-5.9	-18.3	-18.57	-16.5	-10.3	-5.7	-8.2	-15	0	14	
				-8	-4	-8	-9	-6.4	-0.9	-13.3	-13.57	-11.5	-5.3	-0.7	-3.2	-10	0	13	
					4	0	-1	1.6	7.1	-5.3	-5.57	-3.5	2.7	7.3	4.8	-2	6	5	
						-4	-5	-2.4	3.1	-9.3	-9.57	-7.5	-1.3	3.3	0.8	-6	3	8	
							-1	1.6	7.1	-5.3	-5.57	-3.5	2.7	7.3	4.8	-2	5	5	
								2.6	8.1	-4.3	-4.57	-2.5	3.7	8.3	5.8	-1	5	4	
									5.5	-6.9	-7.17	-5.1	1.1	5.7	3.2	-3.6	4	4	
										-12.4	-12.67	-10.6	-4.4	0.2	-2.3	-9.1	1	6	
											-0.27	1.8	8	12.6	10.1	3.3	5	1	
												2.07	8.27	12.87	10.37	3.57	5	0	
													6.2	10.8	8.3	1.5	4	0	
														4.6	2.1	-4.7	2	1	
															-2.5	-9.3	0	2	
																-6.8	0	1	
																	40	50	-10

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 16

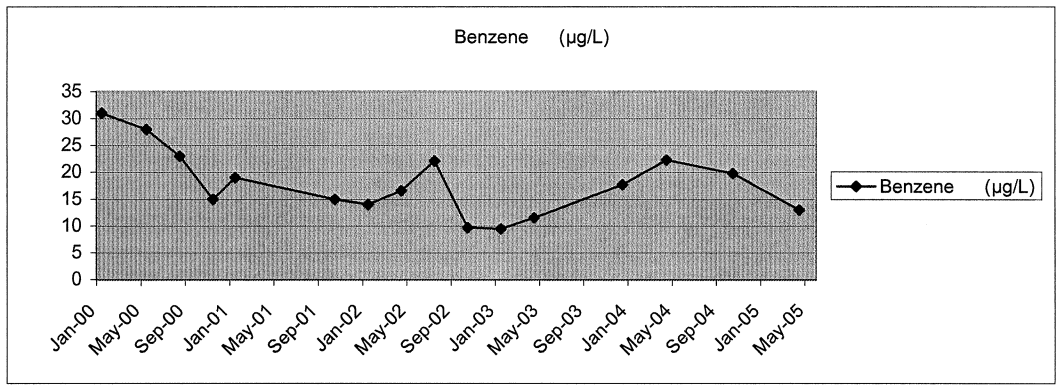
|S|= 10

p = 0.0015

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well C-12

DATE	Jan-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	29	26	29	27	22	21	19	21.6	12.7	2	1.14	1.29	2.37	2.91	5.03	3			
		-3	0	-2	-7	-8	-10	-7.4	-16.3	-27	-27.86	-27.71	-26.63	-26.09	-23.97	-26	0	14	
			3	1	-4	-5	-7	-4.4	-13.3	-24	-24.86	-24.71	-23.63	-23.09	-20.97	-23	2	12	
				-2	-7	-8	-10	-7.4	-16.3	-27	-27.86	-27.71	-26.63	-26.09	-23.97	-26	0	13	
					-5	-6	-8	-5.4	-14.3	-25	-25.86	-25.71	-24.63	-24.09	-21.97	-24	0	12	
						-1	-3	-0.4	-9.3	-20	-20.86	-20.71	-19.63	-19.09	-16.97	-19	0	11	
							-2	0.6	-8.3	-19	-19.86	-19.71	-18.63	-18.09	-15.97	-18	1	9	
								2.6	-6.3	-17	-17.86	-17.71	-16.63	-16.09	-13.97	-16	1	8	
									-8.9	-19.6	-20.46	-20.31	-19.23	-18.69	-16.57	-18.6	0	8	
										-10.7	-11.56	-11.41	-10.33	-9.79	-7.67	-9.7	0	7	
											-0.86	-0.71	0.37	0.91	3.03	1	4	2	
												0.15	1.23	1.77	3.89	1.86	5	0	
													1.08	1.62	3.74	1.71	4	0	
														0.54	2.66	0.63	3	0	
															2.12	0.09	2	0	
																-2.03	0	1	
																	20	71	-51

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 16

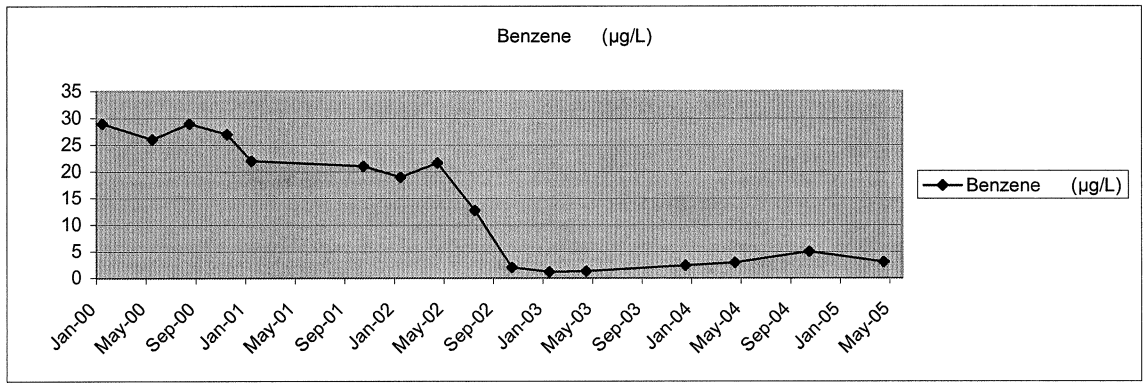
|S|= 51

p < 0.0005

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well C-13

DATE	Jan-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	42	68	93	86	100	97	85	85.8	62.6	35	32.3	32.5	107	118	130	100			
		26	51	44	58	55	43	43.8	20.6	-7	-9.7	-9.5	65	76	88	58	12	3	
			25	18	32	29	17	17.8	-5.4	-33	-35.7	-35.5	39	50	62	32	10	4	
				-7	7	4	-8	-7.2	-30.4	-58	-60.7	-60.5	14	25	37	7	6	7	
					14	11	-1	-0.2	-23.4	-51	-53.7	-53.5	21	32	44	14	6	6	
						-3	-15	-14.2	-37.4	-65	-67.7	-67.5	7	18	30	0	3	7	
							-12	-11.2	-34.4	-62	-64.7	-64.5	10	21	33	3	4	6	
								0.8	-22.4	-50	-52.7	-52.5	22	33	45	15	5	4	
									-23.2	-50.8	-53.5	-53.3	21.2	32.2	44.2	14.2	4	4	
										-27.6	-30.3	-30.1	44.4	55.4	67.4	37.4	4	3	
											-2.7	-2.5	72	83	95	65	4	2	
												0.2	74.7	85.7	97.7	67.7	5	0	
													74.5	85.5	97.5	67.5	4	0	
														11	23	-7	2	1	
															12	-18	1	1	
																-30	0	1	
																	48	42	6

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 16

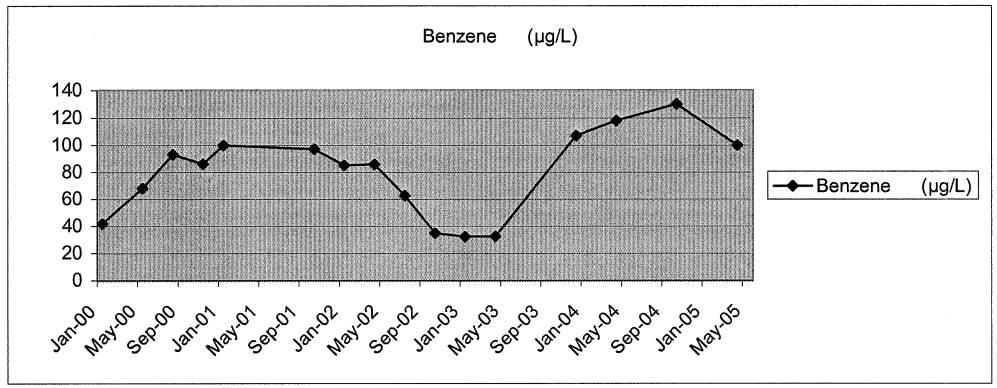
|S|= 6

p = 0.1073

α = 0.1

No statistically significant benzene concentration trend is indicated based on the p value (p>a).

Conclusion: No trend is present.



Monitoring Well C-14

DATE	Jan-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Dec-03	Apr-04	Oct-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	1.6	15	17	12	11	4.8	5.4	8.32	34.5	0.78	2.84	2.14	10.1	6.29	13.6	8			
		13.4	15.4	10.4	9.4	3.2	3.8	6.72	32.9	-0.82	1.24	0.54	8.5	4.69	12	6.4	14	1	
			2	-3	-4	-10.2	-9.6	-6.68	19.5	-14.22	-12.16	-12.86	-4.9	-8.71	-1.4	-7	2	12	
				-5	-6	-12.2	-11.6	-8.68	17.5	-16.22	-14.16	-14.86	-6.9	-10.71	-3.4	-9	1	12	
					-1	-7.2	-6.6	-3.68	22.5	-11.22	-9.16	-9.86	-1.9	-5.71	1.6	-4	2	10	
						-6.2	-5.6	-2.68	23.5	-10.22	-8.16	-8.86	-0.9	-4.71	2.6	-3	2	9	
							0.6	3.52	29.7	-4.02	-1.96	-2.66	5.3	1.49	8.8	3.2	7	3	
								2.92	29.1	-4.62	-2.56	-3.26	4.7	0.89	8.2	2.6	6	3	
									26.18	-7.54	-5.48	-6.18	1.78	-2.03	5.28	-0.32	3	5	
										-33.72	-31.66	-32.36	-24.4	-28.21	-20.9	-26.5	0	7	
											2.06	1.36	9.32	5.51	12.82	7.22	6	0	
												-0.7	7.26	3.45	10.76	5.16	4	1	
													7.96	4.15	11.46	5.86	4	0	
														-3.81	3.5	-2.1	1	2	
															7.31	1.71	2	0	
																-5.6	0	1	
																	38	53	-15

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 16

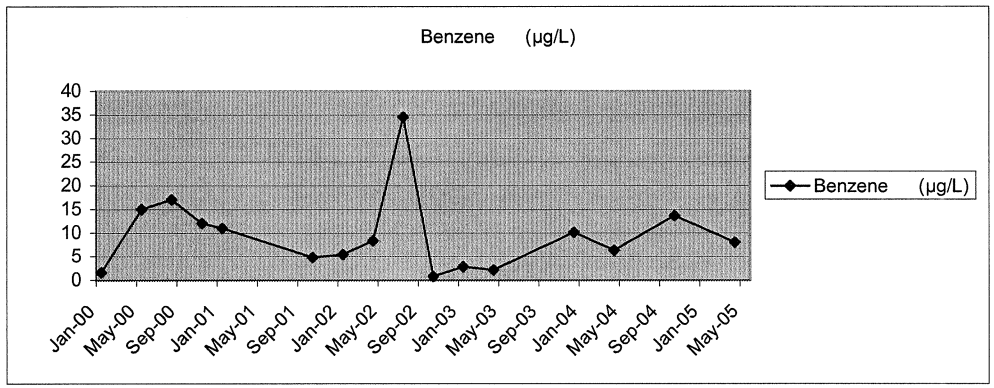
|S|= 15

p = < 0.0005

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and sign (-) of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-15

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
Benzene (µg/L)	58	63.6	58.6	56.3	30.6	25.6	10							
		5.6	0.6	-1.7	-27.4	-32.4	-48					2	4	
			-5	-7.3	-33	-38	-53.6					0	5	
				-2.3	-28	-33	-48.6					0	4	
					-25.7	-30.7	-46.3					0	3	
						-5	-20.6					0	2	
							-15.6					0	1	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												2	19	-17

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

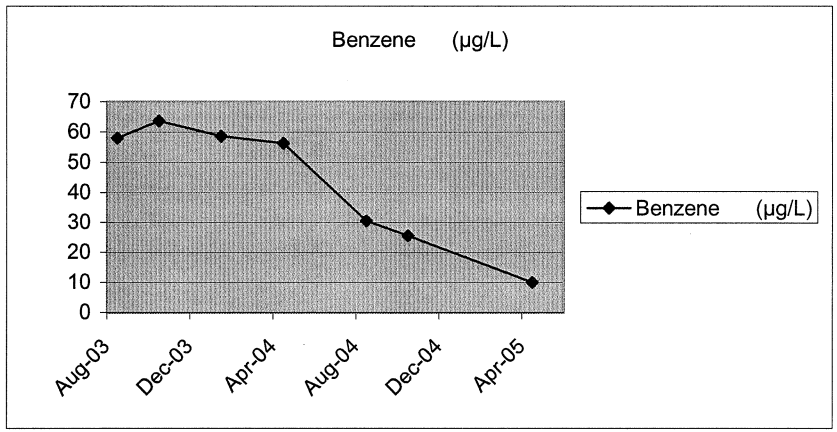
|S|= 17

p = < 0.0005

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and sign (-) of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-16

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
Benzene (µg/L)	58.7	63.4	106	93.1	106	117	140							
		4.7	47.3	34.4	47.3	58.3	81.3					6	0	
			42.6	29.7	42.6	53.6	76.6					5	0	
				-12.9	0	11	34					2	1	
					12.9	23.9	46.9					3	0	
						11	34					2	0	
							23					1	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												19	1	18

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

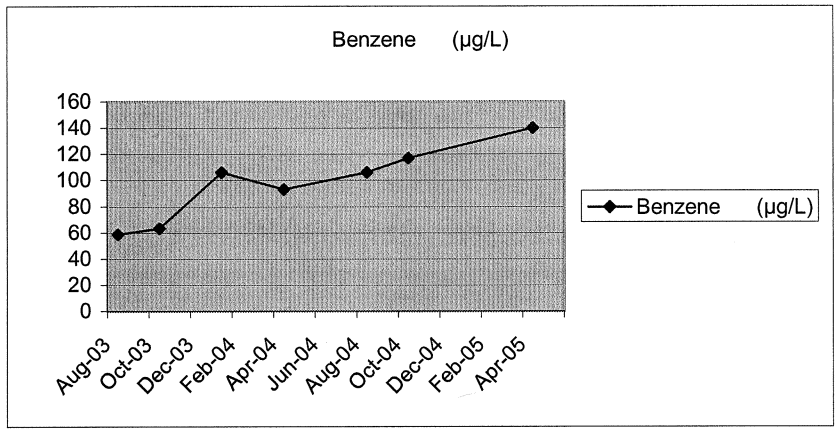
|S|= 18

p = < 0.0005

α = 0.1

A statistically significant increasing benzene concentration trend is indicated based on the p level ($p<\alpha$) and (-) sign of the S value.

Conclusion: An increasing trend is present.



Monitoring Well C-17

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
Benzene (µg/L)	59.3	45.2	53.1	45.2	53.6	47.5	45							
		-14.1	-6.2	-14.1	-5.7	-11.8	-14.3					0	6	
			7.9	0	8.4	2.3	-0.2					3	1	
				-7.9	0.5	-5.6	-8.1					1	3	
					8.4	2.3	-0.2					2	1	
						-6.1	-8.6					0	2	
							-2.5					0	1	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												6	14	-8

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

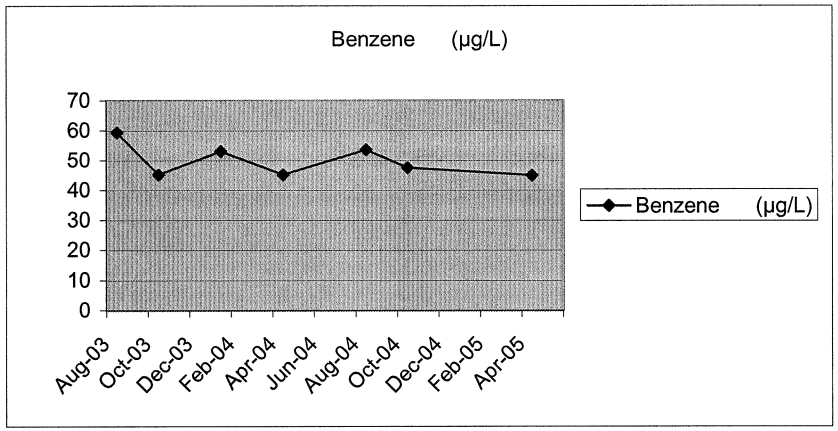
|S|= 8

p = < 0.0005

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and sign (-) of the S value.

Conclusion: No trend is present.



Monitoring Well C-18

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
Benzene (µg/L)	11.7	0.358	*1*	*1*	*1*	*1*	*1*							
		-11.342	-10.7	-10.7	-10.7	-10.7	-10.7					0	6	
			0.642	0.642	0.642	0.642	0.642					5	0	
				0	0	0	0					0	0	
					0	0	0					0	0	
						0	0					0	0	
							0					0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												5	6	-1

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

|S|= 1

p = *

α = 0.1

* Benzene was only detected 2 of the 7 samples; therefore, a Kendall-Mann test is necessary nor appropriate.

Conclusion: No trend is discernible.

Monitoring Well C-19

DATE	Aug-03	Oct-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05					Positive Values	Negative Values	S
Benzene (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*	*1*							
		0	0	0	0	0	0					0	0	
			0	0	0	0	0					0	0	
				0	0	0	0					0	0	
					0	0	0					0	0	
						0	0					0	0	
							0					0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	0

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 7

|S|= 0

p = *

α = 0.1

* Benzene was not detected in any of the 7 samples; therefore, a Kendall-Mann test is not necessary or appropriate.

Conclusion: No trend is discernible; all samples are nondetects.

Monitoring Well C-20

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05							Positive Values	Negative Values	S
Benzene (µg/L)	47.6	32.7	14.9	6.75	1.77	*1*									
		-14.9	-32.7	-40.85	-45.83	-46.6							0	4	
			-17.8	-25.95	-30.93	-31.7							0	4	
				-8.15	-13.13	-13.9							0	3	
					-4.98	-5.75							0	2	
						-0.77							0	1	
													0	0	
													0	0	
													0	0	
													0	0	
													0	0	
													0	0	
													0	0	
													0	14	-14

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

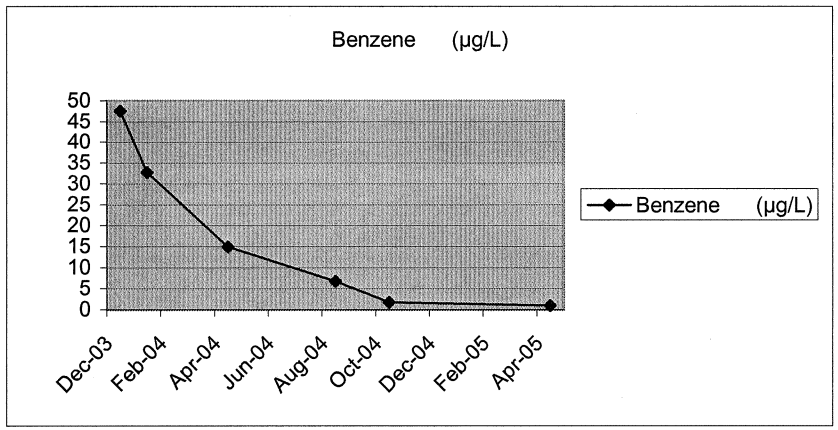
|S|= 14

p = < 0.0005

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value (p<a) and sign (-) of the S value.

Conclusion: Decreasing trend is present.



Monitoring Well C-21

DATE	Dec-03	Jan-04	Apr-04	Aug-04	Oct-04	Apr-05						Positive Values	Negative Values	S
Benzene (µg/L)	*1*	*1*	*1*	*1*	*1*	*1*								
		0	0	0	0	0						0	0	
			0	0	0	0						0	0	
				0	0	0						0	0	
					0	0						0	0	
						0						0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	
												0	0	0

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

|S|= 0

p = *

α = 0.1

* Benzene was not detected in any of the 6 samples; therefore, a Kendall-Mann test is not necessary or appropriate.

Conclusion: No trend is discernible; all samples are nondetects.

Monitoring Well MW-105

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	17	15	8.8	15	11	14	24	*1*	23	34	39	28.4	13.2	19	4.58	*1*	2.26	*1*			
		-2	-8.2	-2	-6	-3	7	-16	6	17	22	11.4	-3.8	2	-12.42	-16	-14.74	-16	6	11	
			-6.2	0	-4	-1	9	-14	8	19	24	13.4	-1.8	4	-10.42	-14	-12.74	-14	6	9	
				6.2	2.2	5.2	15.2	-7.8	14.2	25.2	30.2	19.6	4.4	10.2	-4.22	-7.8	-6.54	-7.8	10	5	
					-4	-1	9	-14	8	19	24	13.4	-1.8	4	-10.42	-14	-12.74	-14	6	8	
						3	13	-10	12	23	28	17.4	2.2	8	-6.42	-10	-8.74	-10	8	5	
							10	-13	9	20	25	14.4	-0.8	5	-9.42	-13	-11.74	-13	6	6	
								-23	-1	10	15	4.4	-10.8	-5	-19.42	-23	-21.74	-23	3	8	
									22	33	38	27.4	12.2	18	3.58	0	1.26	0	8	0	
										11	16	5.4	-9.8	-4	-18.42	-22	-20.74	-22	3	6	
											5	-5.6	-20.8	-15	-29.42	-33	-31.74	-33	1	7	
												-10.6	-25.8	-20	-34.42	-38	-36.74	-38	0	7	
													-15.2	-9.4	-23.82	-27.4	-26.14	-27.4	0	6	
														5.8	-8.62	-12.2	-10.94	-12.2	1	4	
															-14.42	-18	-16.74	-18	0	4	
																-3.58	-2.32	-3.58	0	3	
																	1.26	0	1	0	
																		-1.26	0	1	
																			59	90	-31

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

|S|= 31

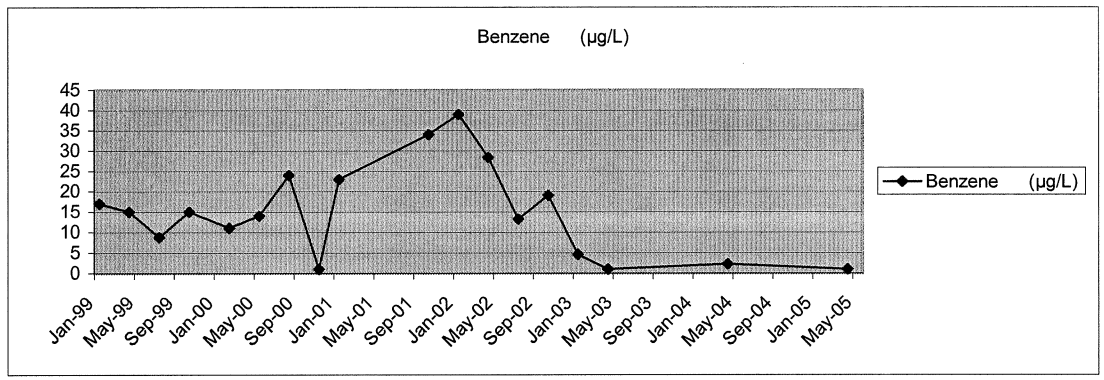
p = 0.542

α = 0.1

No statistically significant benzene concentration trend is indicated based on the p value (p>a).
Conclusion: No trend is present.

Notes:

1 Denotes detection limit value of a nondetect.



Monitoring Well MW-112

DATE	Jan-99	Feb-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05					Positive Values	Negative Values	S
Benzene (µg/L)	31	110	57	26	23.9	39.5	1.5							
		79	26	-5	-7.1	8.5	-29.5					3	3	
			-53	-84	-86.1	-70.5	-108.5					0	5	
				-31	-33.1	-17.5	-55.5					0	4	
					-2.1	13.5	-24.5					1	2	
						15.6	-22.4							
							-38							
												4	14	-10

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 6

|S|= 10

p = 0.371

α = 0.1

No statistically significant benzene concentration trend is indicated based on the p value (p>a).

Conclusion: No trend is present.

Monitoring Well MW-117

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Apr-05	Positive Values	Negative Values	S
Benzene (µg/L)	120	95	98	40	22	28	25	13	17	35	35	8.71	18.4	25	30.3	51	23.6	6.9			
		-25	-22	-80	-98	-92	-95	-107	-103	-85	-85	-111.29	-101.6	-95	-89.7	-69	-96.4	-113.1	0	17	
			3	-55	-73	-67	-70	-82	-78	-60	-60	-86.29	-76.6	-70	-64.7	-44	-71.4	-88.1	1	15	
				-58	-76	-70	-73	-85	-81	-63	-63	-89.29	-79.6	-73	-67.7	-47	-74.4	-91.1	0	15	
					-18	-12	-15	-27	-23	-5	-5	-31.29	-21.6	-15	-9.7	11	-16.4	-33.1	1	13	
						6	3	-9	-5	13	13	-13.29	-3.6	3	8.3	29	1.6	-15.1	8	5	
							-3	-15	-11	7	7	-19.29	-9.6	-3	2.3	23	-4.4	-21.1	4	8	
								-12	-8	10	10	-16.29	-6.6	0	5.3	26	-1.4	-18.1	4	6	
									4	22	22	-4.29	5.4	12	17.3	38	10.6	-6.1	8	2	
										18	18	-8.29	1.4	8	13.3	34	6.6	-10.1	7	2	
											0	-26.29	-16.6	-10	-4.7	16	-11.4	-28.1	1	6	
												-26.29	-16.6	-10	-4.7	16	-11.4	-28.1	1	6	
													9.69	16.29	21.59	42.29	14.89	-1.81	5	1	
														6.6	11.9	32.6	5.2	-11.5	4	1	
															5.3	26	-1.4	-18.1	2	2	
																20.7	-6.7	-23.4	1	2	
																	-27.4	-44.1	0	2	
																		-16.7	0	1	
																			47	104	-57

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

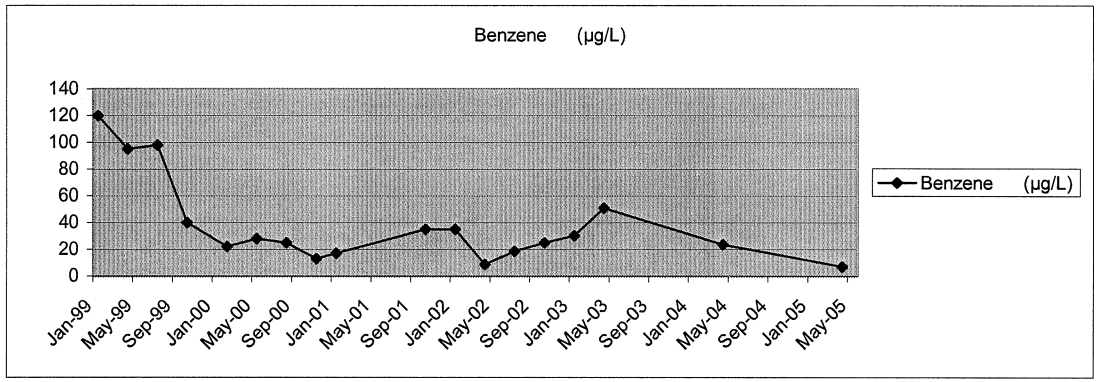
|S|= 57

p = 0.054

α = 0.1

A statistically significant decreasing benzene concentration trend is indicated based on the p value ($p<\alpha$) and sign (-) of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well MW-120

DATE	Jan-99	Apr-99	Jul-99	Oct-99	Feb-00	May-00	Aug-00	Nov-00	Jan-01	Oct-01	Jan-02	Apr-02	Jul-02	Oct-02	Jan-03	Apr-03	Apr-04	Positive Values	Negative Values	S
Benzene (µg/L)	220	150	210	170	81	280	210	77	65	80	110	98.1	124	57	90.9	77	95.5			
		-70	-10	-50	-139	60	-10	-143	-155	-140	-110	-121.9	-96	-163	-129.1	-143	-124.5	1	15	
			60	20	-69	130	60	-73	-85	-70	-40	-51.9	-26	-93	-59.1	-73	-54.5	4	11	
				-40	-129	70	0	-133	-145	-130	-100	-111.9	-86	-153	-119.1	-133	-114.5	1	12	
					-89	110	40	-93	-105	-90	-60	-71.9	-46	-113	-79.1	-93	-74.5	2	11	
						199	129	-4	-16	-1	29	17.1	43	-24	9.9	-4	14.5	7	5	
							-70	-203	-215	-200	-170	-181.9	-156	-223	-189.1	-203	-184.5	0	11	
								-133	-145	-130	-100	-111.9	-86	-153	-119.1	-133	-114.5	0	10	
									-12	3	33	21.1	47	-20	13.9	0	18.5	6	2	
										15	45	33.1	59	-8	25.9	12	30.5	7	1	
											30	18.1	44	-23	10.9	-3	15.5	5	2	
												-11.9	14	-53	-19.1	-33	-14.5	1	5	
													25.9	-41.1	-7.2	-21.1	-2.6	1	4	
														-67	-33.1	-47	-28.5	0	4	
															33.9	20	38.5	3	0	
																-13.9	4.6	1	1	
																	18.5	1	0	
																		40	94	-54

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

n = 17

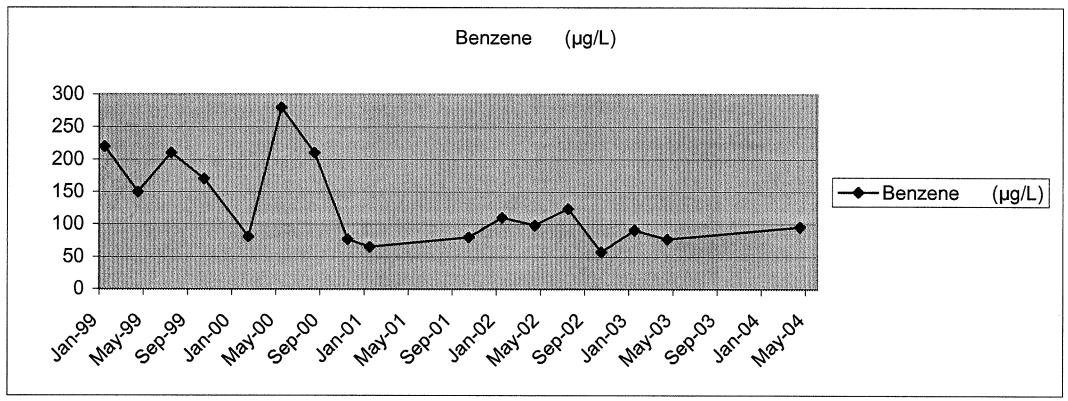
|S|= 54

p = 0.028

α = 0.1

Results indicate a statistically significant decreasing benzene concentration trend based on the p value (p<a) and (-) sign of the S value.

Conclusion: A decreasing trend is present.



Monitoring Well MW-122A

DATE	Oct-99	Aug-00	Jan-01	Jan-02	Jan-03	Apr-04	Apr-05					Positive Values	Negative Values	S
Benzene (µg/L)	110	150	180	160	107	151	170							
		40	70	50	-3	41	60					5	1	
			30	10	-43	1	20					4	1	
				-20	-73	-29	-10					0	4	
					-53	-9	10					1	2	
						44	63							
							19							
												10	8	2

H_0= No concentration trend is present.

H_1= A concentration trend is present (its direction is dependent upon the sign of S).

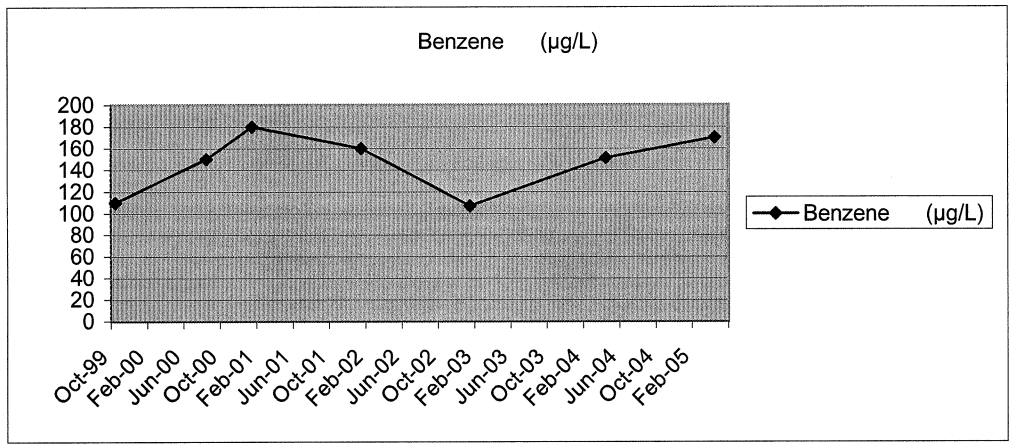
n = 6

|S|= 2

p = 1

α = 0.1

No statistically significant benzene concentration trend is indicated based on the p value (p>a).
Conclusion: No trend is present.



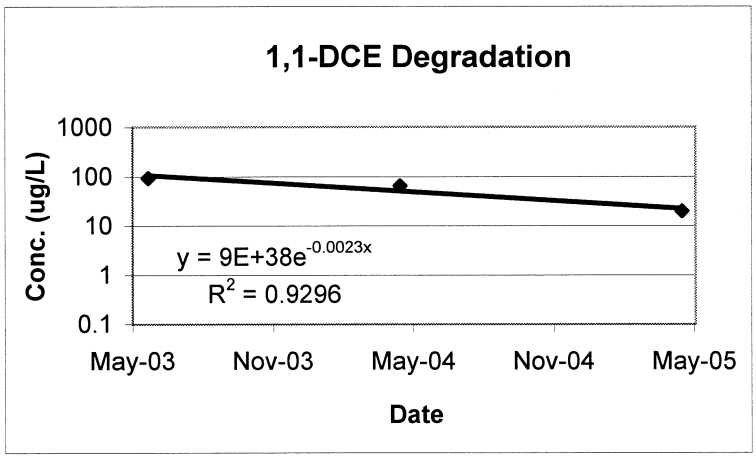
APPENDIX D

BACKUP FOR MNA CALCULATIONS

Figure D-1

1,1-DCE Degradation Rate and Estimated Cleanup Time
Operable Unit 4 (OU-4)
Shaw Air Force Base, Sumter, South Carolina

Sampling Date	1,1-DCE in C-15 (ug/L)
May-03	93.7
Apr-04	65.5
Apr-05	20



Chemical	Attenuation Rate Constant (day^{-1})	Attenuation Half-life (days)	Attenuation Half-life (years)	Current Conc. (ug/L)	MCL for 1,1-DCE (ug/L)	Estimated Cleanup Time (years)
1,1-DCE	0.0023	301.4	0.8	20	7	1.3

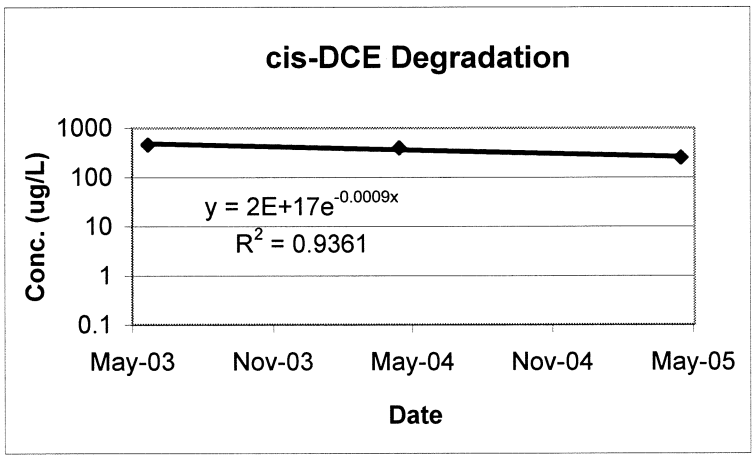
ug/L - micrograms per liter
MCL - maximum contaminant level

Notes:
1) The estimated cleanup time was calculated as the time it would take the most recent detected 1,1-DCE concentration to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.

Figure D-2

cis-1,2-DCE Degradation Rate and Estimated Cleanup Time
Operable Unit 4 (OU-4)
Shaw Air Force Base, Sumter, South Carolina

Sampling Date	cis-DCE in C-15 (ug/L)
May-03	461
Apr-04	397
Apr-05	250



Chemical	Attenuation Rate Constant (day^{-1})	Attenuation Half-life (days)	Attenuation Half-life (years)	Current Conc. (ug/L)	MCL for cis-DCE (ug/L)	Estimated Cleanup Time (years)
cis-DCE	0.0009	770.2	2.1	250	70	3.9

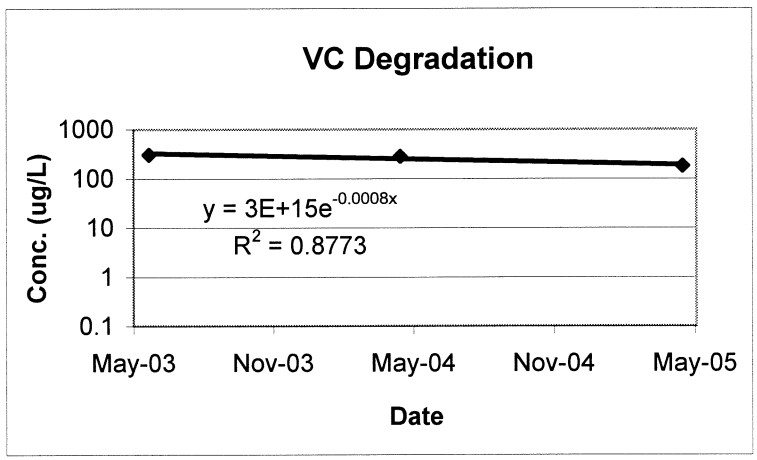
ug/L - micrograms per liter
MCL - maximum contaminant level

Notes:
1) The estimated cleanup time was calculated as the time it would take the most recent detected cis-DCE concentration to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.

Figure D-3

VC Degradation Rate and Estimated Cleanup Time
Operable Unit 4 (OU-4)
Shaw Air Force Base, Sumter, South Carolina

Sampling Date	VC in C-15 (ug/L)
May-03	308
Apr-04	285
Apr-05	180



Chemical	Attenuation Rate Constant (day^{-1})	Attenuation Half-life (days)	Attenuation Half-life (years)	Current Conc. (ug/L)	MCL for VC (ug/L)	Estimated Cleanup Time (years)
VC	0.0008	866.4	2.4	180	2	15.4

ug/L - micrograms per liter
MCL - maximum contaminant level

Notes:
1) The estimated cleanup time was calculated as the time it would take the most recent detected cis-DCE concentration to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

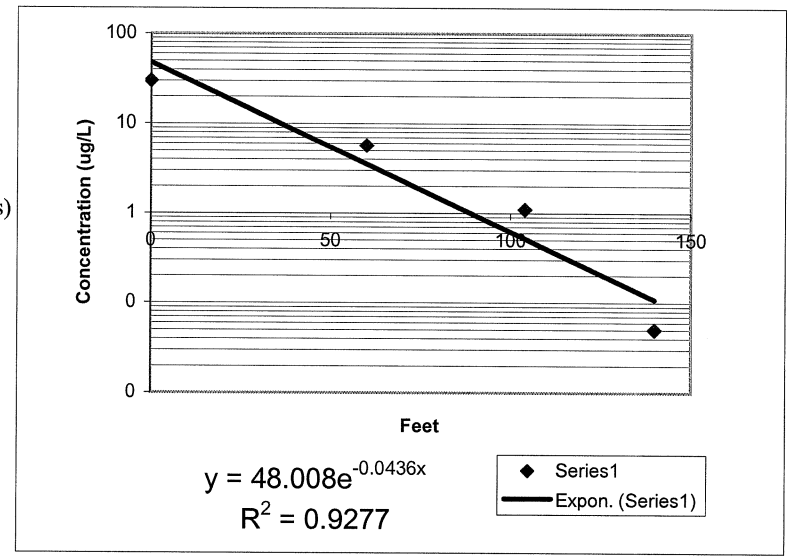
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

1,1-DCA

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C9A	C11	C12	SW202	Slope	R^2
Feet	0	60	104	140	-0.0078	0.37
Concentration	30.0	5.7	1.1	0.05		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



1,1-DCA

λ =	$(v_c/4\alpha_x)$ $([1+2\alpha_x(k/v_x)]^2 - 1)$	
α_x =	5 % of flow field (distance separating two furthest wells)	
	7	ft
f_{oc} =	0.24	
K_{oc} =	40	L/kg
K_d =	$K_{oc}f_{oc}$	
	9.6	L/kg
ρ_b =	1.7	kg/L
n =	0.3	
R =	$1 + (\rho_b K_d/n)$	
	55.400	
v_c =	v_x/R	
	9.8563	ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.3520	/yr
(k/v_x) =	0.0315	/ft
[1+2ax(k/vx)]	1.4410	
λ =	0.3789	/year
Half-life	1.8292	years

Natural Attenuation

k =	17.2003	/year
half-life =	0.04	years
λ/k =	2%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

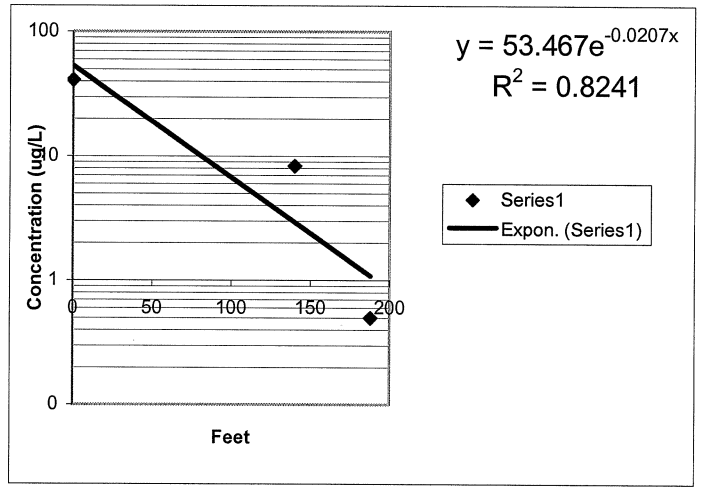
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

1,1-DCA

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C5A	C6A	C7A	SWS203	Slope	R^2
Feet	0.0000		140.00	188	-0.0351	0.82
Concentration	41		8.3	0.5		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



1,1-DCA

λ = $(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

9.4 ft

f_{oc} = 0.24

K_{oc} = 40 L/kg

K_d = $K_{oc}f_{oc}$

9.6 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

55.400

v_c = v_x/R

9.8563 ft/year

Intrinsic Biodegradation		
$(v_c/4\alpha_x)$ =	0.2621	/yr
(k/v_x) =	0.0207	/ft
[1+2ax(k/vx)]	1.3892	
λ =	0.2437	/year
Half-life	2.8440	years

Natural Attenuation		
k =	11.3030	/year
half-life =	0.06	years
λ/k =	2%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

1,1-DCA

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	MW115	C13	C14	SWS204	Slope	R^2
Feet	0.0000	108.00	208.00	316	-0.0062	0.27
Concentration	0.5000	0.500	1.200	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year

1,1-DCA

λ = $(v_c/4\alpha_x)\,([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

15.8 ft

f_{oc} = 0.24

K_{oc} = 40 L/kg

K_d = $K_{oc}f_{oc}$

9.6 L/kg

ρ_b = 1.7 kg/L

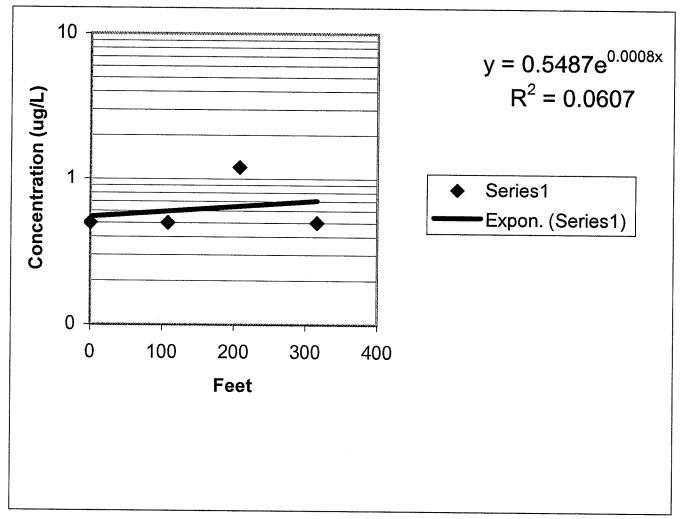
n = 0.3

R = $1 + (\rho_b K_d/n)$

55.400

v_c = v_x/R

9.8563 ft/year



Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.1560	/yr
(k/v_x) =	0.0062	/ft
[1+2ax(k/vx)]	1.1959	
λ =	0.0671	/year
Half-life	10.3308	years

Natural Attenuation

k =	3.3854	/year
half-life =	0.2	years
λ/k =	2%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

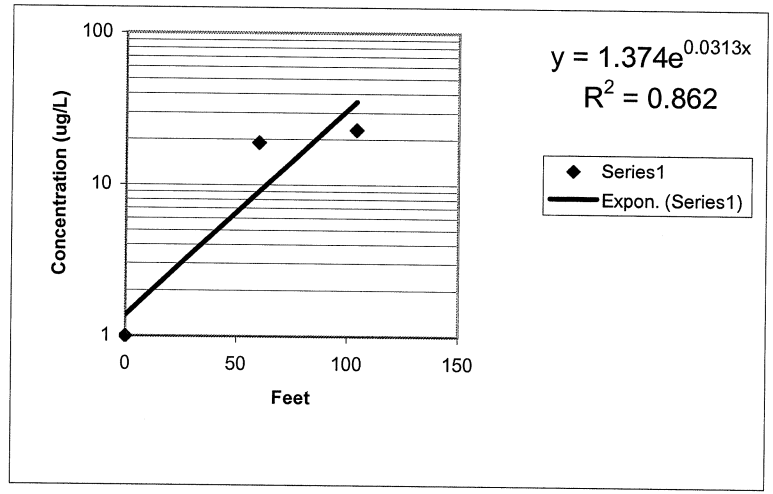
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

1,1-DCE

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C9A	C11	C12	SW202	Slope	R^2
Feet	0	60	104	140	0.0313	0.86
Concentration	1.0000	19.00	23.00			

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



1,1-DCE

λ = $(v_c/4\alpha_x)\,([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

5.2 ft

f_{oc} = 0.24

K_{oc} = 65 L/kg

K_d = $K_{oc}f_{oc}$

15.6 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

89.400

v_c = v_x/R

6.1078 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.2936	/yr
(k/v_x) =	-0.0313	/ft
[1+2ax(k/vx)]	0.6745	
λ =	-0.1601	/year
Half-life	-4.3306	years

Natural Attenuation

k =	-17.0911	/year
half-life =	0.0	years
λ/k =	1%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

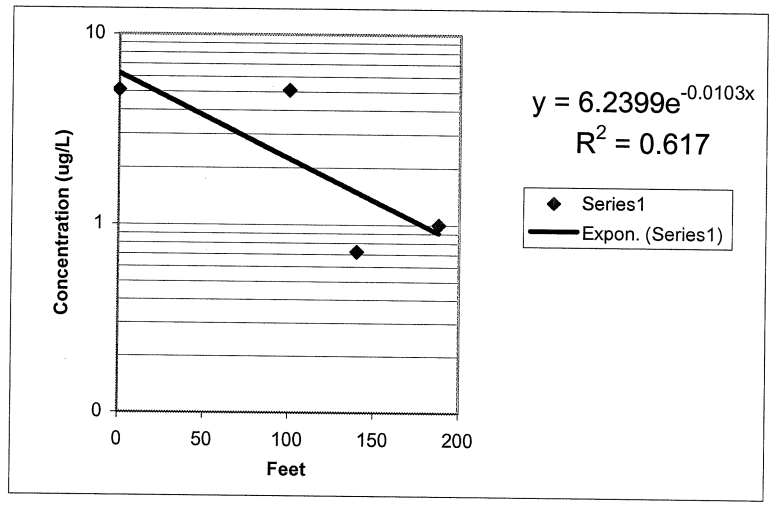
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

1,1-DCE

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C5A	C6A	C7A	SWS203	Slope	R^2
Feet	0.0000	100.00	140.00	188	-0.0103	0.62
Concentration	5.1000	5.100	0.720	1.000		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



1,1-DCE

λ = $(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

9.4 ft

f_{oc} = 0.24

K_{oc} = 65 L/kg

K_d = $K_{oc}f_{oc}$

15.6 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

89.400

v_c = v_x/R

6.1078 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.1624	/yr
(k/v_x) =	0.0103	/ft
[1+2ax(k/vx)]	1.1936	
λ =	0.0690	/year
Half-life	10.0454	years

Natural Attenuation

k =	5.6242	/year
half-life =	0.1	years
λ/k =	1%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

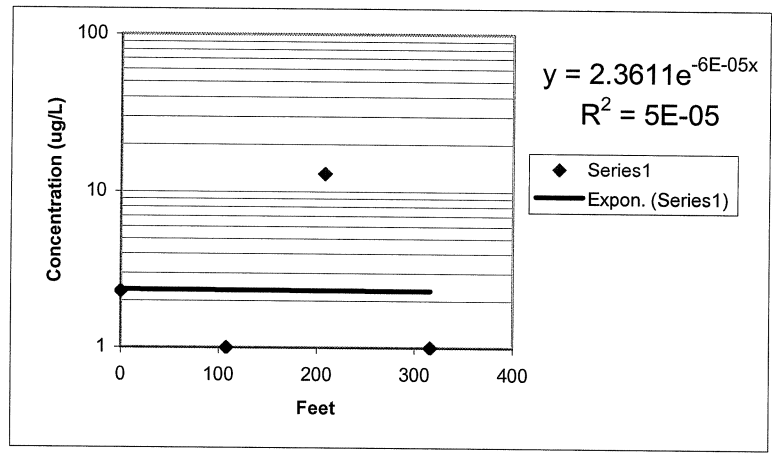
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

1,1-DCE

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	MW115	C13	C14	SW204	Slope	R^2
Feet	0.0000	108.00	208.00	316	0.0000	0.00
Concentration	2.3000	1.000	13.000	1.000		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



1,1-DCE

λ = $(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

15.8 ft

f_{oc} = 0.24

K_{oc} = 65 L/kg

K_d = $K_{oc}f_{oc}$

15.6 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

89.400

v_c = v_x/R

6.1078 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.0966	/yr
(k/v_x) =	0.0000	/ft
[1+2ax(k/vx)]	1.0000	
λ =	0.0000	/year
Half-life	189139.8997	years

Natural Attenuation

k =	0.0003	/year
half-life =	2115.7	years
λ/k =	1%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

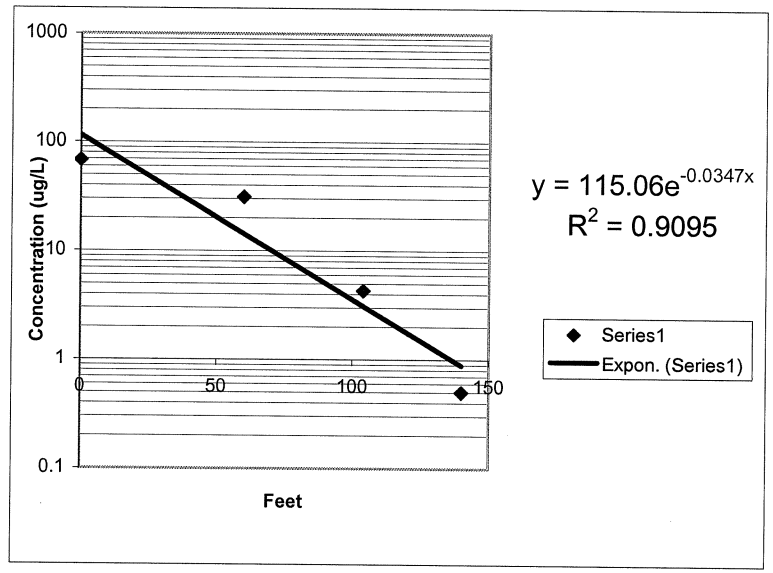
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

CA

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C9A	C11	C12	SW202	Slope	R^2
Feet	0	60	104	140	-0.0081	0.04
Concentration	68	31	4.3	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



CA

λ = $(v_c/4\alpha_x)\,([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

5.2 ft

f_{oc} = 0.24

K_{oc} = 33 L/kg

K_d = $K_{oc}f_{oc}$

7.92 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

45.880

v_c = v_x/R

11.9015 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.5722	/yr
(k/v_x) =	0.0347	/ft
[1+2ax(k/vx)]	1.3609	
λ =	0.4875	/year
Half-life	1.4218	years

Natural Attenuation

k =	18.9476	/year
half-life =	0.04	years
λ/k =	3%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

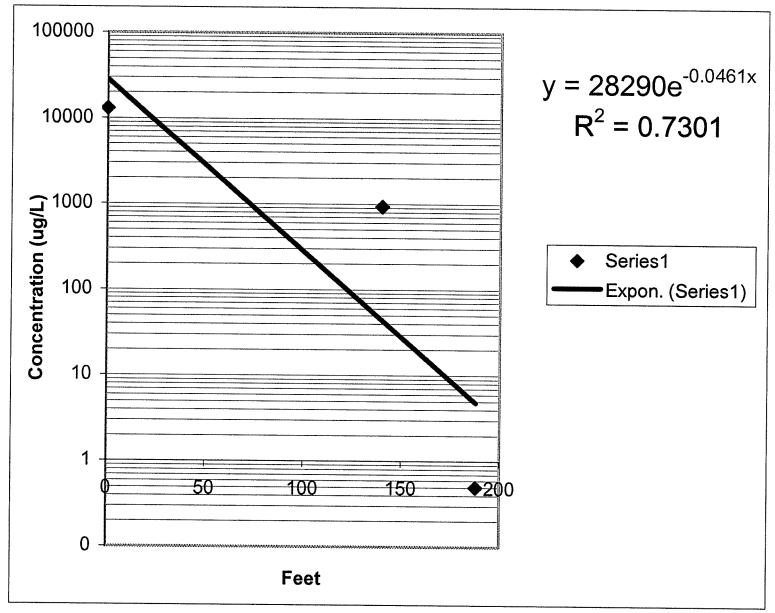
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

CA

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C5A	C6A	C7A	SWS203	Slope	R^2
Feet	0.0000		140.00	188	-0.0358	0.62
Concentration	13000.0000		930.000	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



CA

λ = $(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

7 ft

f_{oc} = 0.24

K_{oc} = 33 L/kg

K_d = $K_{oc}f_{oc}$

7.92 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

45.880

v_c = v_x/R

11.9015 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.4251	/yr
(k/v_x) =	0.0461	/ft
[1+2ax(k/vx)]	1.6454	
λ =	0.7257	/year
Half-life	0.9551	years

Natural Attenuation

k =	25.1724	/year
half-life =	0.03	years
λ/k =	3%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

CA

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	MW115	C13	C14	SWS204	Slope	R^2
Feet		108.00	208.00	316	-0.0117	0.75
Concentration		5700.000	1800.000	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year

CA

λ = $(v_c/4\alpha_x)\,([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

10.4 ft

f_{oc} = 0.24

K_{oc} = 33 L/kg

K_d = $K_{oc}f_{oc}$

7.92 L/kg

ρ_b = 1.7 kg/L

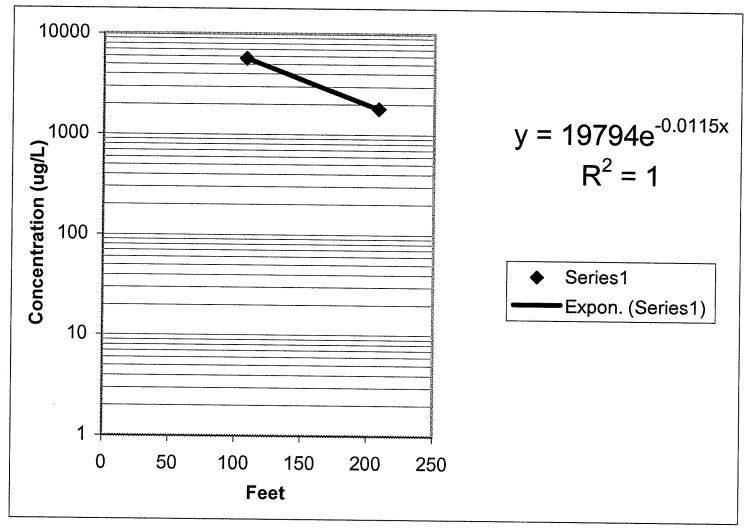
n = 0.3

R = $1 + (\rho_b K_d/n)$

45.880

v_c = v_x/R

11.9015 ft/year



Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.2861	/yr
(k/v_x) =	0.0115	/ft
[1+2ax(k/vx)]	1.2392	
λ =	0.1532	/year
Half-life	4.5234	years

Natural Attenuation

k =	6.2795	/year
half-life =	0.1	years
λ/k =	2%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Trichloroethene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C9A	C11	C12	SW202	Slope	R^2
Feet	0	60	104	140	1.0000	1.00
Concentration	1.0000	1.0000	1.0000	1.000		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year

Trichloroethene

λ = $(v_c/4\alpha_x)([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

5.2 ft

f_{oc} = 0.24

K_{oc} = 107 L/kg

K_d = $K_{oc}f_{oc}$

25.68 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

146.520

v_c = v_x/R

3.7267 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.1792	/yr
(k/v_x) =	-1.0000	/ft
[1+2ax(k/vx)]	-9.4000	
λ =	15.6523	/year
Half-life	0.0443	years

Natural Attenuation Rate

k =	-546.0400	/year
half-life =	0.0	years
λ/k =	-3%	

TCE midtrans

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

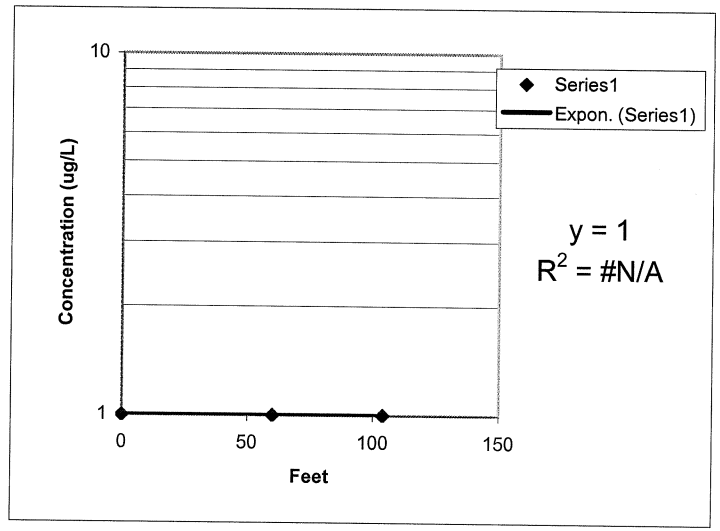
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Trichloroethene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C5A	C6A	C7A	SWS203	Slope	R^2
Feet	0.0000	100.00	140.00	188	1.0000	1.00
Concentration	10U	1U	1U	1.000		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



Trichloroethene

λ = $(v_c/4\alpha_x)\,([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

7 ft

f_{oc} = 0.24

K_{oc} = 107 L/kg

K_d = $K_{oc}f_{oc}$

25.68 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

146.520

v_c = v_x/R

3.7267 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.1331	/yr
(k/v_x) =	-1.0000	/ft
[1+2ax(k/vx)]	-13.0000	
λ =		/year
Half-life		years

Natural Attenuation Rate

k =	/year
half-life =	years
λ/k =	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

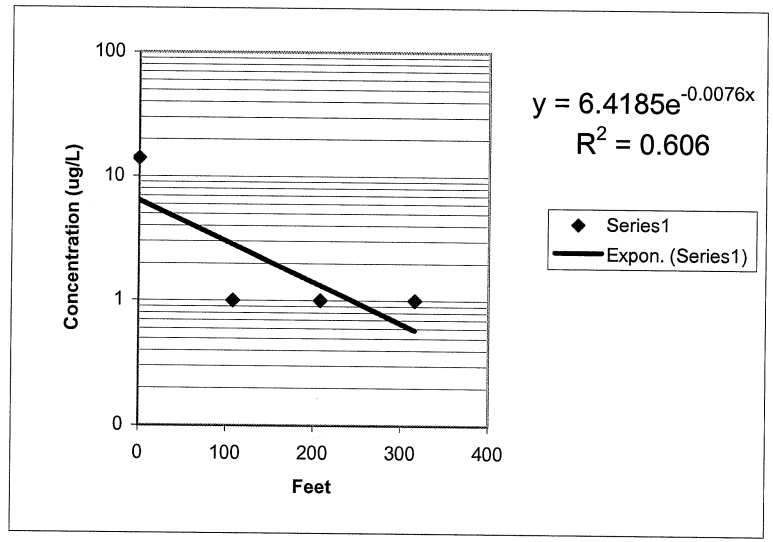
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Trichloroethene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	MW115	C13	C14	SWS204	Slope	R^2
Feet	0.0000	108.00	208.00	316	-0.0076	0.77
Concentration	14.0000	1.00	1.00	1.000		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



Trichloroethene

λ = $(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

0.05 ft

f_{oc} = 0.24

K_{oc} = 107 L/kg

K_d = $K_{oc}f_{oc}$

25.68 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

146.520

v_c = v_x/R

3.7267 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	18.6336	/yr
(k/v_x) =	0.0076	/ft
[1+2ax(k/vx)]	1.0008	
λ =	0.0283	/year
Half-life	24.4635	years

Natural Attenuation Rate

k =	4.1499	/year
half-life =	0.2	years
λ/k =	1%	

cis-DCE north tran

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

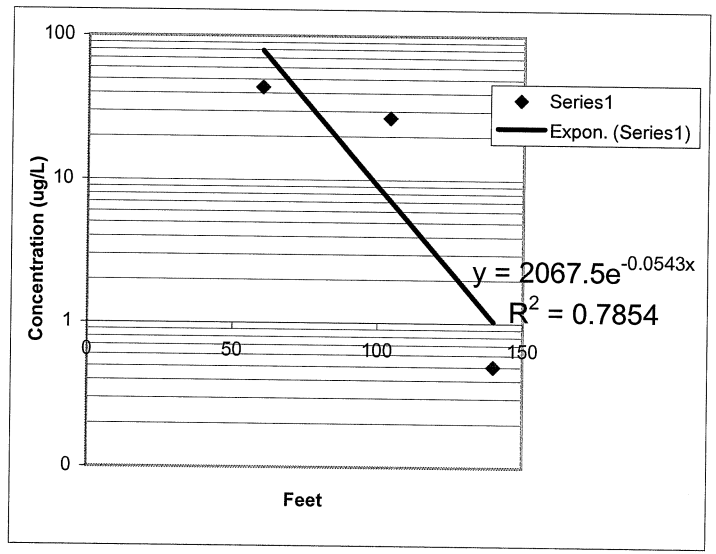
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

cis-Dichloroethene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C9A	C11	C12	SW202	Slope	R^2
Feet		60	104	140	0.0543	0.88
Concentration		44.000	27.000	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



cis-Dichloroethene

λ =	$(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$	
α_x =	5 % of flow field (distance separating two furthest wells)	
	3	ft
f_{oc} =	0.24	
K_{oc} =	49	L/kg
K_d =	$K_{oc}f_{oc}$	
	11.76	L/kg
ρ_b =	1.7	kg/L
n =	0.3	
R =	$1 + (\rho_b K_d/n)$	
	67.640	
v_c =	v_x/R	
	8.0727	ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.6727	/yr
(k/v_x) =	0.0543	/ft
[1+2ax(k/vx)]	1.3258	
λ =	0.5098	/year
Half-life	1.3598	years

Natural Attenuation

k =	29.6500	/year
half-life =	0.0	years
λ/k =	2%	

cis DCE midtran

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

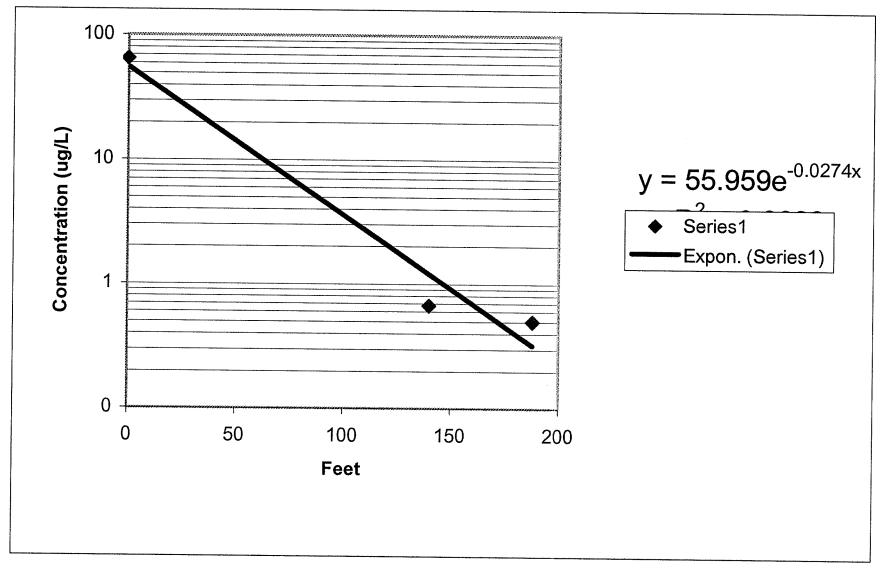
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

cis-Dichloroethene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C5A	C6A	C7A	SWS203	Slope	R^2
Feet	0.0000		140.00	188	-0.0316	0.77
Concentration	65.0000		0.670	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



cis-Dichloroethene

λ =	$(v_c/4\alpha_x)([1+2\alpha_x(k/v_x)]^2 - 1)$	
α_x =	5 % of flow field (distance separating two furthest wells)	
	9.4	ft
f_{oc} =	0.24	
K_{oc} =	49	L/kg
K_d =	$K_{oc}f_{oc}$	
	11.76	L/kg
ρ_b =	1.7	kg/L
n =	0.3	
R =	$1 + (\rho_b K_d/n)$	
	67.640	
v_c =	v_x/R	
	8.0727	ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.2147	/yr
(k/v_x) =	0.0274	/ft
[1+2ax(k/vx)]	1.5151	
λ =	0.2782	/year
Half-life	2.4919	years

Natural Attenuation

k =	14.9615	/year
half-life =	0.0	years
λ/k =	2%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

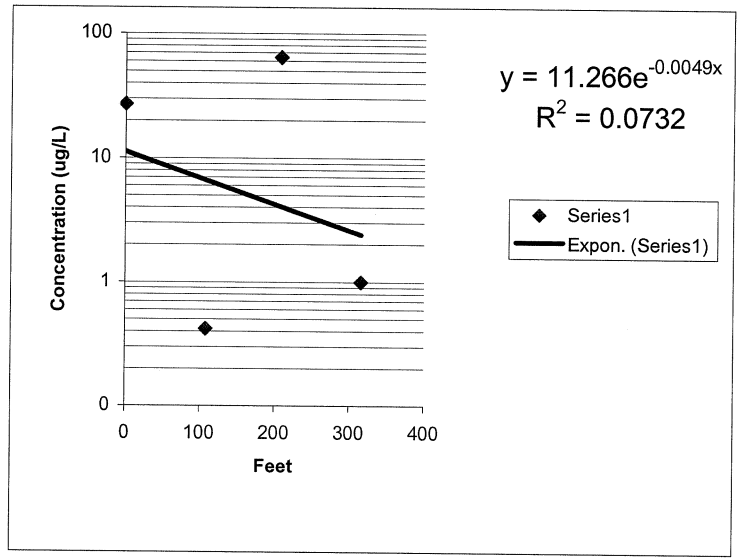
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

cis-Dichloroethene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	MW115	C13	C14	SWS204	Slope	R^2
Feet	0.0000	108.00	208.00	316	-0.0049	0.07
Concentration	27.0000	0.420	64.000	1.000		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



cis-Dichloroethene

λ =	$(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$	
α_x =	5 % of flow field (distance separating two furthest wells)	
	15.8	ft
f_{oc} =	0.24	
K_{oc} =	49	L/kg
K_d =	$K_{oc}f_{oc}$	
	11.76	L/kg
ρ_b =	1.7	kg/L
n =	0.3	
R =	$1 + (\rho_b K_d/n)$	
	67.640	
v_c =	v_x/R	
	8.0727	ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.1277	/yr
(k/v_x) =	0.0049	/ft
[1+2ax(k/vx)]	1.1548	
λ =	0.0426	/year
Half-life	16.2639	years

Natural Attenuation

k =	2.6756	/year
half-life =	0.3	years
λ/k =	2%	

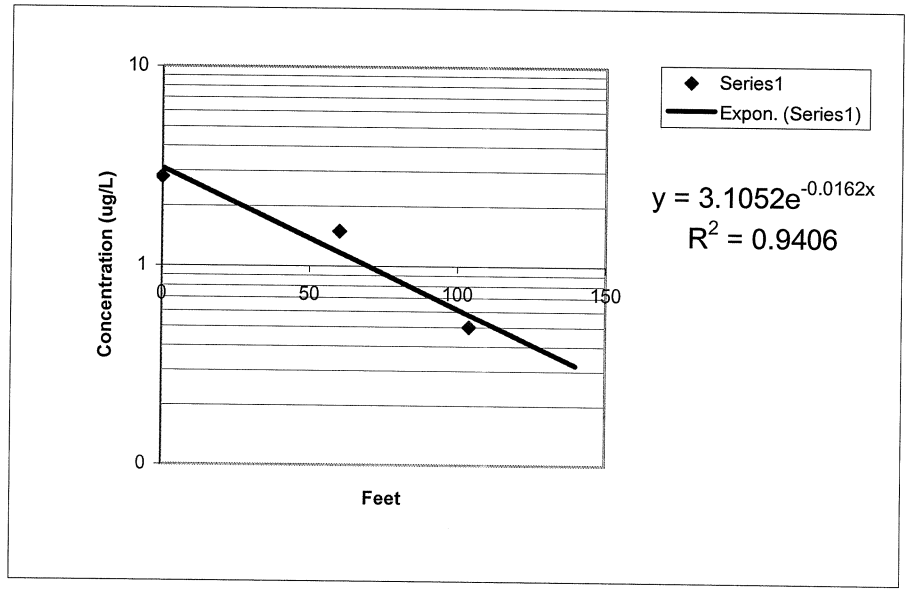
Vinyl Chloride

in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C9A	C11	C12	SW202	Slope	R^2
Feet	0	60	104	140	-0.0162	0.53
Concentration	3.0000	2.80	1.50	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



Vinyl Chloride

λ =	$(v_c/4\alpha_x)([1+2\alpha_x(k/v_x)]^2 - 1)$
α_x =	5 % of flow field (distance separating two furthest wells)
	5.2 ft
f_{oc} =	0.24
K_{oc} =	2.45 L/kg
K_d =	$K_{oc}f_{oc}$
	0.588 L/kg
ρ_b =	1.7 kg/L
n =	0.3
R =	$1 + (\rho_b K_d/n)$
	4.332
v_c =	v_x/R
	126.0480 ft/year

Natural Attenuation Rate

$(v_c/4\alpha_x)$ =	6.0600	/yr
(k/v_x) =	0.0162	/ft
[1+2ax(k/vx)]	1.1685	
λ =	2.2140	/year
Half-life	0.3131	years

Intrinsic Biodegradation

k =	8.8458	/year
half-life =	0.1	years
λ/k =	25%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

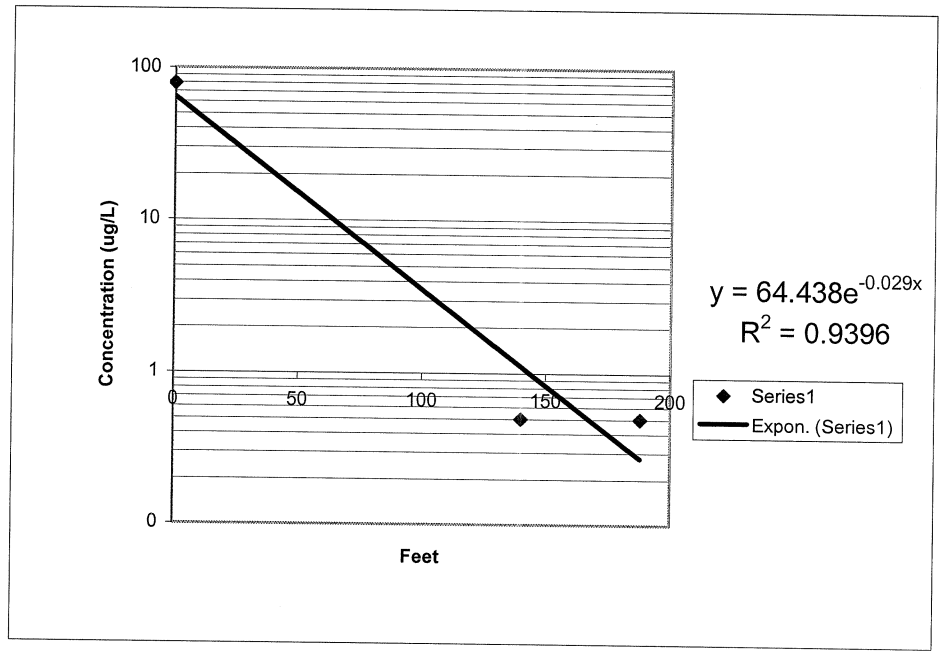
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Vinyl Chloride

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C5A	C6A	C7A	SWS203	Slope	R^2
Feet	0.0000		140.00	188	-0.0238	0.73
Concentration	79.0000		0.500	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



Vinyl Chloride

λ =	$(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$	
α_x =	5 % of flow field (distance separating two furthest wells)	
	9.4	ft
f_{oc} =	0.24	
K_{oc} =	2.45	L/kg
K_d =	$K_{oc}f_{oc}$	
	0.588	L/kg
ρ_b =	1.7	kg/L
n =	0.3	
R =	$1 + (\rho_b K_d/n)$	
	4.332	
v_c =	v_x/R	
	126.0480	ft/year

Intrinsic Biogradation

$(v_c/4\alpha_x)$ =	3.3523	/yr
(k/v_x) =	0.0290	/ft
[1+2ax(k/vx)]	1.5452	
λ =	4.6519	/year
Half-life	0.1490	years

Natural attenuation rates

k =	15.8352	/year
half-life =	0.0	years
λ/k =	29%	

VC southtran

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

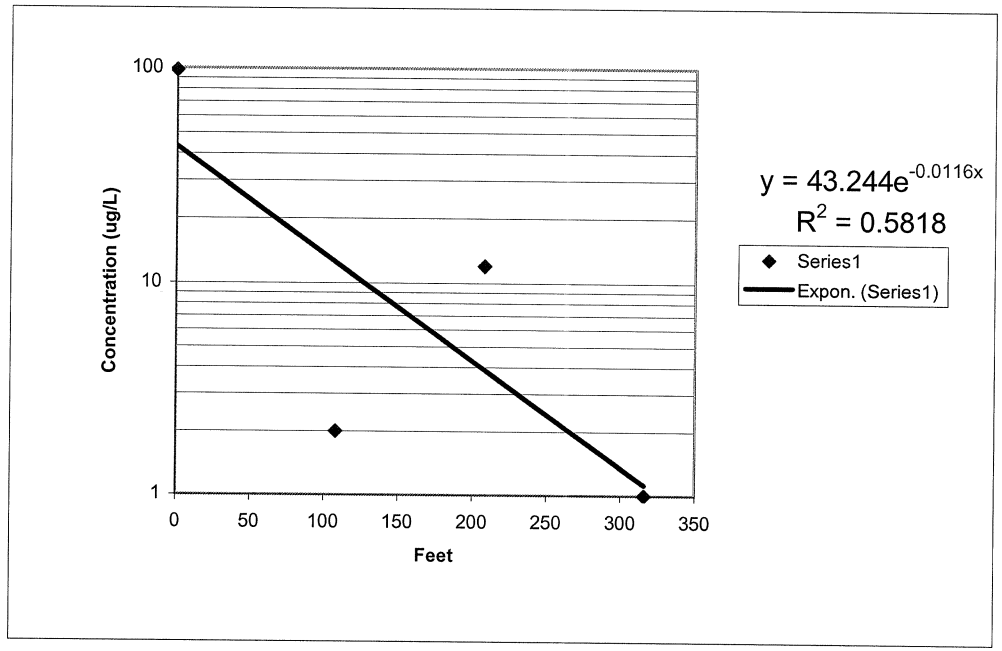
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Vinyl Chloride

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	MW115	C13	C14	SWS204	Slope	R^2
Feet	0.0000	108.00	208.00	316	-0.0116	0.58
Concentration	98.0000	2.000	12.000	1.000		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



Vinyl Chloride

λ = $(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

15.8 ft

f_{oc} = 0.24

K_{oc} = 2.45 L/kg

K_d = $K_{oc}f_{oc}$

0.588 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

4.332

v_c = v_x/R

126.0480 ft/year

Natural Attenuation Rate

$(v_c/4\alpha_x)$ =	1.9944	/yr
(k/v_x) =	0.0116	/ft
[1+2ax(k/vx)]	1.3666	
λ =	1.7301	/year
Half-life	0.4006	years

Intrinsic Biodegradation

k =	6.3341	/year
half-life =	0.1	years
λ/k =	27%	

Benzene northtran

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

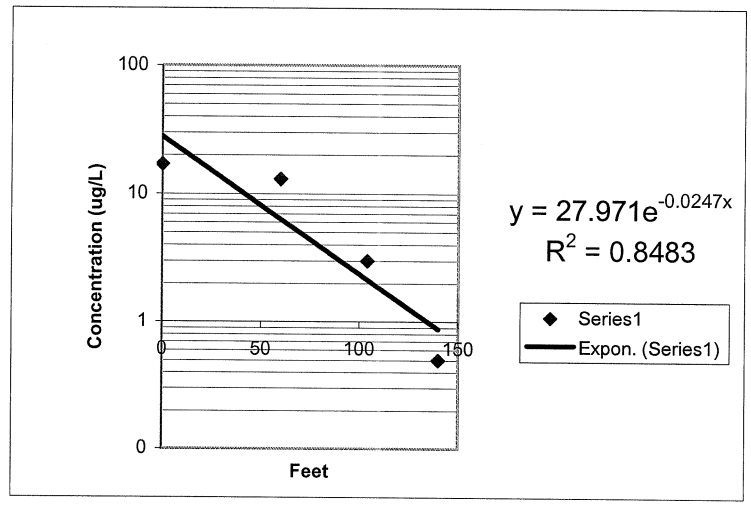
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Benzene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C9A	C11	C12	SW202	Slope	R^2
Feet	0	60	104	140	-0.0008	0.076
Concentration	17.0000	13.00	3.00	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



Benzene

λ =	$(v_c/4\alpha_x)([1+2\alpha_x(k/v_x)]^2 - 1)$	
α_x =	5 % of flow field (distance separating two furthest wells)	
	5.2	ft
f_{oc} =	0.24	
K_{oc} =	79	L/kg
K_d =	$K_{oc}f_{oc}$	
	18.96	L/kg
ρ_b =	1.7	kg/L
n =	0.3	
R =	$1 + (\rho_b K_d/n)$	
	108.440	
v_c =	v_x/R	
	5.0354	ft/year

Intrinsic Biodegradation		
$(v_c/4\alpha_x)$ =	0.2421	/yr
(k/v_x) =	0.0247	/ft
[1+2ax(k/vx)]	1.2569	
λ =	0.1403	/year
Half-life	4.9387	years

Natural Attenuation rate		
k =	13.4872	/year
half-life =	0.1	years
λ/k =	1%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

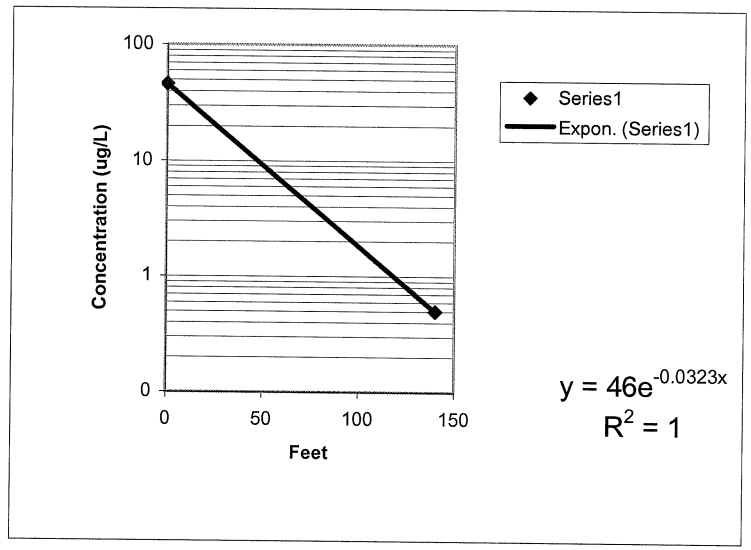
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Benzene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	C5A	C6A	C7A	SWS203	Slope	R^2
Feet	0.0000		140.00	188	-0.0090	0.958
Concentration	46.0000		0.500	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



Benzene

λ = $(v_c/4\alpha_x)\ ([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

7 ft

f_{oc} = 0.24

K_{oc} = 79 L/kg

K_d = $K_{oc}f_{oc}$

18.96 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

108.440

v_c = v_x/R

5.0354 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.1798	/yr
(k/v_x) =	0.0323	/ft
[1+2ax(k/vx)]	1.4522	
λ =	0.1994	/year
Half-life	3.4759	years

Natural Attenuation rate

k =	17.6371	/year
half-life =	0.0	years
λ/k =	1%	

Natural Attenuation Rate Calculation, Buscheck and Alcantar Equation,

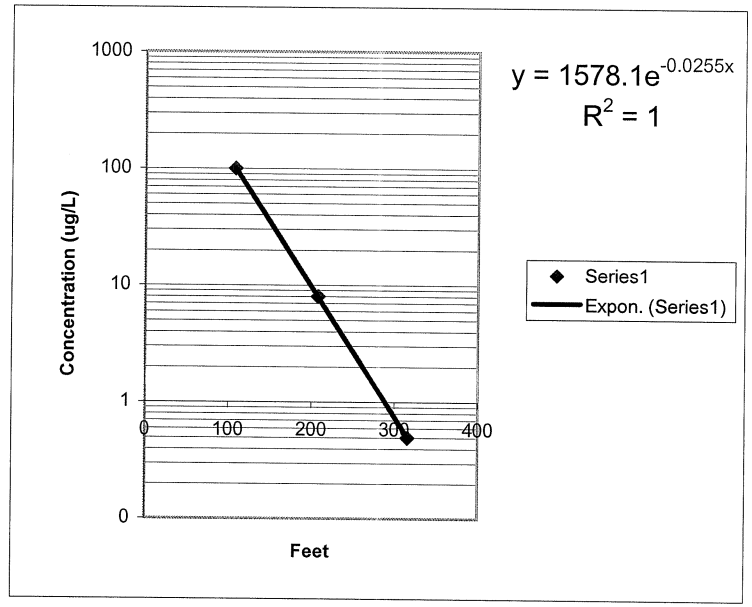
Reference: Buscheck, T. E. and C. M. Alcantar (1995) Regression Techniques and Analytical Solutions to Demonstrate Intrinsic Biodegradation in Intrinsic Bioremediation, eds. R. E. Hinchee, J. T. Wilson, and D. C. Downey, Battelle Press, Columbus, OH.

Benzene

Slope of exponential regression versus distance (k/v_x)

Monitoring Well	MW115	C13	C14	SWS204	Slope	R^2
Feet		108.00	208.00	316	-0.0152	0.89
Concentration		100.000	8.000	0.500		

Hydraulic Conductivity	66	ft/day
Groundwater Gradient	0.0068	ft/ft
Porosity	0.3	porosity
Average groundwater velocity, v_x =	1.496	ft/day
	546.04	ft/year



Benzene

λ = $(v_c/4\alpha_x)\,([1+2\alpha_x(k/v_x)]^2 - 1)$

α_x = 5 % of flow field (distance separating two furthest wells)

10.4 ft

f_{oc} = 0.24

K_{oc} = 79 L/kg

K_d = $K_{oc}f_{oc}$

18.96 L/kg

ρ_b = 1.7 kg/L

n = 0.3

R = $1 + (\rho_b K_d/n)$

108.440

v_c = v_x/R

5.0354 ft/year

Intrinsic Biodegradation

$(v_c/4\alpha_x)$ =	0.1210	/yr
(k/v_x) =	0.0255	/ft
[1+2ax(k/vx)]	1.5304	
λ =	0.1625	/year
Half-life	4.2667	years

Natural Attenuation rate

k =	13.9240	/year
half-life =	0.0	years
λ/k =	1%	

Table 7
SD33
Natural Attenuation Rate Estimates and the Contribution of Intrinsic Biodegradation
Shaw Air Force Base, Sumter, South Carolina

Chemical of Concern	Well Series	Intrinsic Biodegradation Half-life (years)	Natural Attenuation Half-life (years)	Contribution of Biodegradation to Attenuation (percent)

	easting (mm)	northing (mm)		easting (ft)	northing (ft)
C1	17	69	C1	68	276
C3A	15	90	C3A	60	360
C5A	13	117	C5A	52	468
C6A	36	119	C6A	144	476
C7A	47	120	C7A	188	480
C9A	11	123	C9A	44	492
C10	8	144	C10	32	576
C11	24	130	C11	96	520
C12	35	133	C12	140	532
C13	45	92	C13	180	368
C14	68	100	C14	272	400
MW-118	45	17	MW-118	180	68

Relative Mass

	Volume		Area	
	1999	2000	1999	2000
TCA	12230800	0	20245	0
percent		0		0
%reduction		100		100
DCA	97191700	0	47315.9	0
		0		0
		100		100
DCE	8800410	3193500	103153	67592.8
		36.28808		65.52674
		63.71192		34.47326
VC	2708420	7544960	118879	119929