PRELIMINARY SUBSURFACE INVESTIGATION SITE 4 NS GREAT LAKES IL
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Great Lakes
Site 4
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2/1998 Preliminary
Subsurface
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578

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

The location and site history of the Fire Fighting Training Unit at the Great Lakes Naval Training Center was described in the Trench Activity Report dated July 1998. For purposes of the remedial investigation the site is defined by the fenced area of the former FFTU, extending to the west to the headwaters of Skokie Ditch. All stormwater runoff from the site leaves the site at the headwaters shown on Figure 1.

The subsurface investigation at the site was conducted in three phases. In the first phase soil samples were collected from the trenches made during demolition of the piping and other subsurface structures at the site. This is described in the Trench Activity Report. The locations of the trench soil samples are shown on Figure 2.

The second phase of the subsurface investigation utilized cone penetrometer testing to describe the geologic framework at the site and collect deep soil and groundwater samples. The second and third phases of the subsurface investigation involved the use of direct- push technology to provide better coverage of the site at a lower cost. The third phase of the investigation was a shallow direct push investigation to evaluate the soil and groundwater contamination in the shallow strata at the site. Surface water and sediment samples were also collected. Surface water samples were collected from the east and north ditches and from both of the lagoons at the site. Sediment samples were taken at approximately the same location near the edge of water.

As with the trench sampling, two (2) types of sampling protocols were employed. The CERCLA protocol was utilized for surface water and sediment samples and for areas near the oil/water separator and former sludge pit. These samples were analyzed for the target compound list volatiles, semi-volatiles, pesticides, PCBs, and herbicide compounds.

The leaking underground storage tank (LUST) protocols were used for samples in areas near USTs, fuel piping, burn pits and the carrier compartments. These samples were concentrated in the areas were the trench sampling revealed petroleum contamination. The samples were analyzed for benzene, ethylbenzene, toulene, xylene, and the polynuclear aromatics compounds.

2.0 SUBSURFACE SAMPLING

2.1 Cone Penetrometer Investigation

The CPT portion of the direct push investigation was completed in June 1997. CPT soundings were conducted with continuous pore pressure and electrical conductance measurements at nine (9) locations. The CPT sounding locations are shown in Figure 3.

The CPT soundings were made to total depths of 50 to 75 feet. In general the CPT soundings indicate that the material beneath site consists of a shallow sandy fill material to an average depth of approximately 15 feet. From 15 feet to approximately 35 feet, a hard, clay till or diamicton of the Wadsworth Formation was encountered. Sand layers or sandy silt layers were found between 35 and 45 feet. A second diamicton was encountered between 45 and 70 feet. Most of the CPT soundings terminated on refusal at approximately 70 to 75 feet. The unit at that depth is believed to be a hard gravel unit at the top of the Lemont Formation.

Groundwater samples were collected at five (5) of the sounding locations identified in Figure 3 as CP001, CP002, CP003, CP005, and CP008. The groundwater samples were collected according to the methodology outlined in the Appendix A of the QAPP. All the groundwater samples were collected from the sandy or silty layer between the first and second diamictons at depths between 33 and 47 feet.

The diamicton units are relatively impermeable. Unsaturated layers, as indicated by negative pore pressures in the CPT soundings, were encountered within the diamicton units. The sand and sandy silt layers between 33 and 47 feet were saturated.

Five (5) groundwater samples were collected from below the first diamicton unit. Those samples were collected at the locations of CPT soundings CP001, CP002, CP003, CP005, and CP008. The analytical data indicated that contamination did not reach to that depth. For that reason the remainder of the remedial investigation concentrated on the shallow units above the first diamicton.

2.2 Soil Investigation

In the first phase of subsurface investigation, samples were collected from the trench as demolition of the piping and USTs was completed. Samples were collected at one hundred sixty-four (164) locations. These locations are shown on the map in Figure 2. A total of eighty-three (83) of the samples were collected and analyzed according to the CERCLA protocols. A total of eighty-one (81) of the samples were collected and analyzed according to the LUST protocols. Sampling procedures and results are discussed in the Trench Activity Report dated July 1998.

The third phase of the subsurface investigation was conducted utilizing a Geoprobe direct push unit. Direct push borings were made at the forty-one (41) locations shown on the map in Figure 3. At each location continuous soil samples were collected from the surface down to the top of the first diamicton unit. Samples were collected utilizing a 4-foot core barrel with an acetate liner. A composite of the 4-foot interval was submitted for field screening analysis in accordance with the sample handling documentation and collection procedures are described in Appendix A of the QAPP. The boring logs for the shallow direct push investigation can be found in Appendix 1.

For field screening, the soil samples from all Phase 2 and Phase 3 locations were analyzed (on site) for benzene, ethylbenzene, toulene, xylene and selected polynuclear aromatic compounds (PNAs). The field screening analysis is described in Section 3.1. Approximately 20 percent of the samples were submitted for laboratory confirmation. A total of ten (10) of the soil samples were submitted for analysis utilizing the CERCLA protocols. A total of fourteen (14) samples were submitted to the laboratory for analysis utilizing the LUST protocols. The locations where soil samples were submitted to the laboratory, and the depth interval of the samples are shown on Figure 3.

2.3 Monitoring Well Installation and Development

A total of twenty-one (21) monitoring wells were installed in the direct push borings at the site. Seventeen (17) of the monitoring wells were installed in the shallow (Geoprobe) borings above the first diamicton. Four (4) of the monitoring wells were installed in the silt and sandy units immediately below the first diamicton during the CPT phase. The monitoring well locations are shown on the map in Figure 4. The well construction details are shown on the Well Completion Report forms in Appendix 2.

The monitoring well construction was performed as described in Section 8.2 of Appendix A of the QAPP. The deeper monitoring wells installed with the CPT unit were constructed of ¾" ID Schedule 80 PVC in lieu of Schedule 40. All of the monitoring wells were completed with the protective steel cover at the surface, installed either flush with grade or stick-up.

Following well completion, each monitoring well was developed to remove residual drilling fluids and fine-grained materials near the screen. This was accomplished by removing water from the well, and drawing water through the filter pack and well screen. Well development was performed one (1) to two (2) days following completion of the well, in order to allow sufficient time for the bentonite seal to hydrate. The wells were pumped during development until the turbidity was significantly reduced in water removed from the well. This generally occurred after approximately five (5) borehole volumes of water were removed from the well.

2.4 Hydraulic Testing and Groundwater Flow

Hydraulic testing was performed to evaluate the hydraulic properties of the shallow water bearing units (approximately 6-16' below grade). Slug tests were performed on monitoring wells MW-30-98 and MW-41-98. The hydraulic conductivities calculated as a result of the tests were 800 centimeters per day and 256 centimeters per day respectively. The slug test data and analysis are provided in Appendix 3.

All monitoring wells were surveyed in order to establish AMSL elevations at the top of riser for each well. Water level measurements were made in all of the monitoring wells on May 7, 1998. The resulting potentiometric surface based on those measurements is shown in Figure 5. Groundwater flow is from east to west across the site. The potentiometric contours converge at the West Side of the site indicating discharge to the headwaters of Skokie Ditch. The average horizontal gradient at the site is approximately .01. Measurements in the deep monitoring wells, in the sand below the first diamicton, indicate a downward vertical gradient.

2.5 Groundwater Sampling

Groundwater samples were collected during the direct push investigation at the time of the direct push installation and later through the slim 1" pvc well points. Groundwater sampling at each direct push boring location, was conducted as discussed in Appendix A of the QAPP. In instances where a 1" pvc monitoring well was installed, subsequent groundwater sampling may have been conducted. Samples from the 1" pvc monitoring wells were collected during well development (Section 2.3). Prior to well sampling, each well was purged by slowly pumping with an inertia pump to remove at least three (3) borehole volumes of water prior to sample collection. The sampling documentation and collection procedures were conducted as described in Appendix A of the QAPP.

3.0 SAMPLE ANALYTICAL RESULTS

The results of the samples collected during trenching activities were discussed in the Trench Activity Report dated July 1998. All soil and groundwater samples collected during the direct push portion of the subsurface investigation, were analyzed on site. The field-screening analysis is described in Section 3.1 below. Approximately 20 percent of the samples analyzed in the field were submitted to the laboratory for analysis of either the CERCLA or LUST constituents. Quality control samples were also collected during both the trenching and the direct push portion of the subsurface investigation.

3.1 Field Screening Analysis

Soil and groundwater samples collected during the direct portion of the subsurface investigation were analyzed in a field laboratory for benzene, ethylbenzene, toulene, xylene and selected polynuclear aromatic compounds (PNAs). The PNAs included acenaphthene, anthracene, fluoranthene, fluorene, naphthalene and pyrene. The volatile organic constituents including BETX and naphthalene were analyzed using a GC with a purge and trap injection port. The PNAs were analyzed using a GC with a thermal desorption injection port. The field screening methodologies are discussed below:

3.1.1 BETX and Naphthalene Analysis

A SRI 9300A gas chromatograph with a purge and trap injection port and a flame ionization detector was used to analyze for the volatile hydrocarbons including BETX and naphthalene. To analyze soil using an EPA style Purge & Trap a 1-gram or less soil sample was weighed into a new factory cleaned test tube and covered with 5ml of clean water. The sample was dispersed by vigorous shaking or ultrasonic vibration in different cases. The test tube was connected to the GC and the analysis is initiated. A chromatography data acquisition and control system, such as SRI's PeakSimple Data System controlled the sequence of operations by which the purge and trap extracts the volatile hydrocarbon molecules in the soil.

A total of fifty-three (53) groundwater samples were collected from forty-four (44) locations. This includes field-screening samples, as well as samples submitted to the laboratory for analysis of CERCLA or LUST constituents. All sample results were utilized to define "hot spots", because lab confirmation samples correllated nicely to the field screening samples. The field screening analysis is described in Section 3.1. The twenty (20) groundwater sampling locations where samples were submitted to the laboratory for analysis are shown on the map in Figure 6. The monitoring well numbers correspond directly to the direct push boring numbers (i.e. MW-30-98 was installed in direct push boring DP030).

2.6 Decontamination

Decontamination of sampling equipment was performed as described Appendix A, Section 7 of the QAPP.

2.7 Investigation Derived Wastes

Investigation derived wastes were disposed according to the procedures outlined in Appendix A, Section 15 of the QAPP.

First, the wet purge gas, which was typically the same helium used for the GCs carrier gas, bubbles up through the soil and water for 4 to 10 minutes. Volatile/purgeable hydrocarbons but not semi-volatile hydrocarbons were evaporated off into the bubbling helium and were carried through a series of two traps. With the traps at room temperature, the hydrocarbons stick to the absorbent inside of the trap tube while the helium and water vapor continue through the tap and out to vent. After 4 to 10 minutes, all of the volatile/purgeable petroleum hydrocarbons were removed from the waster and were absorbed on the trap. Under the control of the PeakSimple Data System, the traps were heated and automatically placed in line with the GCs carrier gas. When the traps were hot, the previously trapped petroleum molecules break free and were swept by the carrier gas onto the GC column where they separate into the respective peaks. Because all of the purgeable volatiles in the 1 gram soil sample were injected into the GC, and not mostly discarded as it would have been in the solvent extraction method, detection limits were much lower than the solvent extraction method. Detection limits were often down to 1 part per billion and below. In some cases, where the actual hydrocarbon contamination in the soil was at a high level, the purge and trap method was actually too sensitive without dilution of the sample. At the end of the analysis, the software output a hardcopy report with sample ID, type of analyses, concentration values, and the chromatogram.

3.1.2 PNA Analysis

A SRI 9300A gas chromatograph with a thermal desorption injection port and a flame ionization detector was used for PNA analysis. The GC was configured with a non-polar 0.53 mm x 15-meter capillary column. The field GC system was made to withstand the shock and vibration of field conditions. A built-in air compressor and a single small tank of hydrogen supplied the gas necessary for the whole process.

The temperature of the GC oven was programmed from 50 to 310 degrees centigrade to elute the hydrocarbon peaks in boiling point order. The whole process, from desorption to data acquisition was controlled by a SRI's PeakSimple for Windows operating system software. At the end of the analysis, the software output a hardcopy report with sample ID, type of analyses, concentration values, and the chromatogram.

3.1.3 Field Screening Calibration

The quantification of the components was based on the standards run previously on the GC system at various concentrations. BETX and PNAs standards in various solvents were used to calibrate the GC system. The PNA compounds for which calibration standards were run were:

Acenaphthene
Acenaphthalene
Anthracene
Fluoranthene
Fluorene
Naphthalene
Phenanthrene
Pyrene

Instrument calibration was also controlled by the PeakSimple software.

3.2 "CERCLA" Samples

Selected soil and groundwater samples were submitted to ARDL laboratories, in Mt. Vernon, Illinois, for analysis of the target compound list (TCL) constituents. ARDL, Inc. is a CLP laboratory and performed the analyses according to the Level 3 protocol. Six (6) groundwater samples collected during the CPT phase of subsurface investigation, were analyzed for the TCL compounds but were not submitted to the CLP lab.

The CERCLA samples were concentrated in areas where results of the trench sampling indicated possible "hot spot". The suspected "hot spot" areas included the carrier compartment areas on the northeast side of the site and the oil/water separator and lagoon areas on the West Side of the site. The locations where the CERCLA soil and groundwater samples were collected are shown in Figures 3 and 6 respectively. The samples were analyzed and reported as described in the QAPP.

3.2.1 Analytical Results of CERCLA Soil Samples

A total of 14 solid matrix samples, ten soil and four sediment samples, in addition to the samples discussed in the Trench Activity Report, were analyzed for volatile organic, semi-volatile organic, Pesticides/PCBs, and Chlorinated Herbicide compounds.

For the **volatile organic compounds** none of the 14 samples indicated concentrations in excess of the practical quantitation limit for the methods used.

For the **semi-volatile organic compounds** one (1) of the 14 sample locations indicated concentrations in excess of the practical quantitation limit for the methods used. The sample number was DPO20, which was converted to a 1" pvc well MW-20-98. Benzo(a)pyrene and Dibenzo(a,h)anthracene were detected in soil in a composite from 0 to 4 feet in depth, at concentrations of 360 and 140 ug/kg respectively.

For the **pesticide/PCB organic compounds** none of the 14 samples indicated concentrations in excess of the practical quantitation limit for the methods used.

For the **Chlorinated Herbicide organic compounds** none of the 14 samples indicated concentrations of in excess of the practical quantitation limit for the methods used.

3.2.2 Analytical Results of CERCLA Water Samples

A total of 21 liquid matrix samples, 17 groundwater and four surface water samples were analyzed for volatile organic, semi-volatile organic, Pesticides/PCBs, and Chlorinated Herbicide compounds.

For the **volatile organic compounds** one (1) of the 21 samples indicated concentrations in excess of the practical quantitation limit for the methods used. Methylene Chloride was detected at one location, in Monitoring Well MW-39-98, at a concentration of 5.3 ug/L. Monitoring Well MW-39-98 is located upgradient of the site. Methylene Chloride and Acetone were frequently detected in the method blanks for samples analyzed at the CLP laboratory and are believed to be laboratory contaminants., therefore, the presence of methylene chloride at MW-39-98 is discounted as insignificant (see data validation.)

For the **semi-volatile organic compounds** none of the 21 samples indicated concentrations in excess of the practical quantitation limit for the methods used.

For the **pesticide/PCB organic compounds** none of the 21 samples indicated concentrations in excess of the practical quantitation limit for the methods used.

For the **Chlorinated Herbicide organic compounds** none of the 21 samples indicated concentrations of in excess of the practical quantitation limit for the methods used.

3.3 "LUST" Samples

Selected soil and groundwater samples were designated as "confirmation" samples and submitted to Beling Laboratories for analysis of the BETX constituents and to First Environmental Laboratories for analysis of the PNA constituents. These samples were concentrated in areas where the trench sampling results indicated possible "hot spots". These areas included the underground storage tank and fuel line areas in the south and southwest sides of the site. The locations where the LUST soil and groundwater samples were collected are shown in Figures 3 and 6 respectively. Samples were collected and reported as described in the QAPP.

3.3.1 Analytical Results of LUST Soil Samples

A total of 14 "confirmation" soil samples were analyzed, in addition to the samples discussed in the Trench Activity Report, for BETX and PNA compounds. Nine (9) of the 14 samples indicated concentrations of BETX or PNAs in excess of the detection limit and/or practical quantitation limit for the methods used. Table 1 provides the quantitation results with the IEPA TACO (Tiered Approach to Clean-up Objectives) Residential, Tier 1 remediation objectives for the significant pathways at the bottom for reference. The pathways include soil ingestion, soil inhalation, and soil leaching to Class I groundwater. Table 1 also includes the USEPA Region IX Preliminary Remediation Goals (PRGs) for cross-reference to federal guidelines are germane to closure, and IEPA maintains purview for review and closure of this site.

The samples indicating the highest concentrations of BETX and PNA compounds were collected from a depth of 4 to 8 feet and were located near the USTs and fuel lines associated with the southernmost training area. The concentration and distribution of these contaminants is discussed further in Section 4.0.

3.3.2 Analytical Results of LUST Groundwater Samples

A total of 10 "confirmation" groundwater samples were sent to a laboratory and analyzed for BETX and PNA compounds. Four (4) of the 10 samples indicated concentrations of BETX or PNAs in excess of the detection limit and/or practical quantitation limit for the methods used. Table 2 provides the quantitation results with the IEPA TACO Residential, Tier 1 remediation objectives for Class I groundwater.

The samples indicating the highest concentrations of BETX and PNA compounds were located downgradient of the USTs and fuel lines associated with the southernmost training area. All of these samples are from the shallow sands above the first diamicton. The concentration and distribution of these contaminants is discussed further in Section 4.0.

3.4 QA/QC Samples

Quality control samples were routinely collected during the subsurface investigation as part of the data validation process. The quality control samples included trip blanks, temperature blanks and field duplicates. For the CERCLA groundwater samples some matrix spike and matrix spike duplicate samples were also collected. Temperature and trip blanks accompanied every cooler submitted to the laboratory. Field duplicates were collected on approximately 10 percent of the soil and groundwater samples collected. The QA/QC samples were collected, analyzed and documented as described in the QAPP.

3.5 Data Validation

Data validation was performed in accordance with the QAPP document previously referenced in this Report. Per project requirements, ten percent of all CERCLA samples submitted to the CLP lab underwent data review. CLP Samples were grouped into two sets, regardless of their submission date to the laboratory, then the sample for validation was selected using a random number table (see the Trench Activity Report for soil sample validation). A total of 26 samples (10 soil and 14 groundwater, and 2 sediment), were submitted to the CLP lab. The six (6) groundwater samples collected during the CPT phase of subsurface investigation were analyzed for the TCL compounds but were not submitted to the CLP lab. The data sets for samples subsequent to the trench activity soil samples were broken up as indicated below, to ensure a random ten percent were examined for QA/QC purposes.

Groundwater Samples MW- [25,26,30,35,36,39] -98 and
DP- [002,006,017,020] Validation examination:
MW-25-98

Soil Samples DP- [002-2,005-2,007-2,008-2,008-2,008-3,017-1,020-1,] and
DP- [020-2,033-2,034-2] Validation examination: DP-008-2

Sediment and Surface Water Samples SED001-004, SW001-004 and
DP- [025,026] Validation examination: SED003

ARDL, Inc performed the Lab analyses and Beling Consultants performed the sample validation. Each of the 28 samples (including the 2 duplicates) were analyzed for Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOAs or BNA Extractable Compounds), Organochlorine Pesticides/PCBs and Chlorinated Herbicides. Beling prepared a data validation report for each sample set identified above. Each report was prepared according to the Contract Lab Program Statement of Work OLM03.0 methods for Volatile Organic Compounds, Semi-volatile Organic Compounds and Organochlorine Pesticides/PCBs as published by the USEPA and a Laboratory specific adaptation of SW-846 Method 8151 for Chlorinated Herbicides that was included in the project's approved QAPP. Additional technical guidance was obtained from the Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses (USEPA EPA/540/R/082 December 1994).

3.5.1 Summary of Data Qualifiers

Review of **MW-25-98** indicated that no qualifiers were necessary for that sample.

Review of **DP-008-2** indicated that the internal standard performance QC criteria for semivolatile analyses were met for this sample, however the internal standard recovery was out of range for the original analyses and the re-analysis required the following quantifications:
Fluorene and acenaphthene- Qualifier "J" for this sample means "results are estimated and the data are valid for limited purposes. The results are qualitatively acceptable"

Review of **SED003** indicated that the internal standard performance QC criteria for volatile analyses were met for this sample, however the internal standard was out of range for the original analyses and the re-analysis required the following quantifications: Qualifier "UJ" was applied for nine compounds due to the re-analysis of the Internal Standard. UJ means "the reported quantification limit is estimated because Quality Control criteria were not met. Compound was not detected".

3.5.2 Technical Holding Times

Technical holding time criteria were met for all sample analyses associated with the validation process.

3.5.3 Instrument Calibration (Initial)

All initial calibration criteria for VOCs, SVOCs, and Pesticide/PCBs as specified in the CLP Statement of Work OLM03.0 were met. Calibration criteria for the Herbicide fraction were met as specified in the laboratory specific method found in the QAPP for this sampling program. Slight differences in the lab calculation for % relative standard of deviation (RSD) and the reviewer's calculations are considered to be due to rounding and are not significant.

3.5.4 Instrument Calibration (Continuing)

All continuing calibration criteria for VOCs, SVOCs, Pesticide/PCBs and Herbicides were evaluated. The data as reported by ARDL are acceptable without modifications or additional qualifiers based on the evaluation prescribed in the CLP SOW.

3.5.5 Instrument Tuning

GC/MS and GC tuning criteria, as specified in the CLP SOW OLM03.0, were met for all soil samples evaluated during the data validation process for VOCs, SVOCs, and Pesticide/PCB fractions. In addition, GC tuning as specified in the laboratory specific analysis method for Herbicides as specified in the project QAPP was also met.

3.5.6 Blank Sample Analyses

The method blanks for each data set were evaluated for concentrations above the RL. Concentrations above the RL were noted for common laboratory contaminants as discussed above. No target compound list (TCL) compounds were detected in the extraction blank analyses for SVOCs, Pesticide/PCBs or Herbicide fractions.

3.5.7 Surrogate Spike Performance

Surrogate spike recovery QC criteria for CLP SOW OLM03.0 and the laboratory specific method were met for VOC, SVOC, Pesticide/PCB and Herbicide analyses associated with the validation process. The Volatile analysis of the original sample and rerun of **SED003** had a surrogate recovery for Chlorobenzene-d5 outside of acceptance range. The data are not qualified since the rerun had adequate recovery for the internal standard

3.5.8 Internal Standard

Internal Standard performance QC criteria for CLP SOW OLM03.0 for VOCs and SVOCs were met. Re-analyses were necessary in a few instances, with minor qualifications necessary as provided in 4.1 above. In one case, a transcription error was also noted between raw data for VOCs and the summary-reporting sheet, but there was no effect on the acceptability of the recoveries.

3.5.9 Matrix Spike/Matrix Spike Duplicate Analyses

MS/MSDS were not required for soil samples, biopile samples, sediment or derived waste samples. The laboratory utilized was required to perform QA/QC analysis of this type on 5 % of the groundwater samples submitted for analysis. One MS/MSD was submitted to the CLP lab, however, analysis of the MS/MSD was not completed. No explanation was offered by the lab.

3.5.10 Compound Identification and Quantification

No problems were observed or noted for compound identification with the designated samples for VOCs, SVOCs, Pesticide/PCB or Herbicide analyses.

3.5.11 System Performance

No problems with system performance were noted.

3.5.12 Compound Quantitation/System Log Tables/Preparation Logs

The data packages from ARDL included compound quantitation reports, system logging reports and preparation logs for all VOC, SVOC, Pesticide/PCB and Herbicide analyses performed.

3.5.13 Duplicate Groundwater Samples

Duplicate groundwater samples were collected at the prescribed ratio of 10% as required by the QAPP. The following pairs of samples provide the duplicate groundwater sample:

CPT97-3	duplicate sample	CPT97-3dup (not submitted to the CLP lab)
MW-35-98	duplicate sample	MS35

The Data validation checklist includes review of duplicates for instances where duplicates correspond with the samples selected for validation review.

3.6 Soil Geotechnical Analysis

Seven (7) soil samples were collected at six (6) locations in an attempt to represent the soils across the site. The sample depths selected were determined by the lithology at that boring location. The samples were tested for geotechnical parameters, which include, in part, hydrometer analysis, classification moisture content, moist and dry bulk density, total organic carbon, and porosity. Please refer to Appendix 4 for the complete Geotechnical Laboratory Reports. Also, refer to Figure 3 for the boring locations.

At the boring location identified as CP-001, three (3) soil samples were collected: (SS-001-1, SS-001-2, and SS-001-3). SS-001-1 was collected between 22 and 23.5 feet below the surface and taken from the first diamicton layer encountered. The soil classification was determined to be that of a Lean Clay with sand (CL). Soil sample SS-001-2 was collected between 36 and 37 feet below the surface and taken at the interface between the first diamicton and a sandy layer above the second diamicton.

The soil classification was determined to be a silty clay (CL-CM). Soil Sample SS-001-3 was collected between 37 and 37.5 feet below the surface. This sandy sample was taken below the first diamicton layer. The soil classification was determined to silt with sand (ML).

At the boring location CP-005, one (1) soil sample, CP-005-1, was collected between 42 and 43.5 feet below the surface. This sample was taken from the sandy unit on top of the second diamicton layer. The soil classification was determined to be a silty sand (SM).

The remaining three (3) soil samples were collected in the stratagraphic units above the first diamicton unit encountered at the site. At boring DP-012, a soil sample from 4 to 8 feet below the surface was collected. The soil classification was determined to be silty sand (SM). At boring DP-029, two (2) soil samples were collected. The samples were collected from depths of 1 to 5 feet and 7 to 11 feet below the surface. The soil classifications were determined to be silty clay (CL-ML), and poorly graded sand (SP-SM), respectively. Percent porosity was determined to .4310 in the silty clay, while porosity varied between silty sand (DP-012) at .3661, and poorly graded sand (DP-029) at .3014. Dry bulk density was found to be 95.1 (PCF) in the silty clay sample. The silty sand had a dry bulk density of 106.1, while the poorly graded sand was 116.8.

4.0 TIER 1 TACO

The remediation objectives for the site with respect to the contaminants of concern are the TACO, Tier 1 Remediation Objectives for Residential Properties (35 IAC Part 742, Appendix B). The FFTU Site is currently surrounded by a golf course and the proposed future land use for the site is as a driving range. The Tier 1 analysis consists of an evaluation of the constituents of concern with respect to the remediation objectives, and evaluation of the potential for free product, and an evaluation of the routes of exposure. The Tier 1 evaluation for the project encompasses all of the samples collected including the trench and the subsurface investigation samples.

4.1 Contaminants of Concern

For suspect areas, the preliminary contaminants of concern were the full TCL Volatile Organics, Semi-volatile Organics, pesticides, PCBs and chlorinated herbicides. The CERCLA samples were concentrated in the area surrounding the carrier compartment, storm drains, oil/water separator, and the lagoons. For the areas where petroleum contamination was suspected, the preliminary contaminants of concern were the LUST contaminants, BETX and PNAs.

The final contaminants of concern are those constituents that exceeded a TACO Tier 1 Objective. Table 3 lists the contaminants of concern and the maximum exceedances for both soil and groundwater. The final contaminants of concern are the BETX constituents and naphthalene.

The groundwater ingestion pathway remediation objective was exceeded only for benzene and naphthalene. The approximate area where benzene exceeds the remediation objective is shown in Figure 7. The approximate area where naphthalene exceeds the remediation objective is shown in Figure 8.

The soil migration to Class 1 groundwater route of exposure was exceeded only for benzene, ethylbenzene, toulene, and xylene. The approximate areas where the BETX constituents exceed the respective remediation objectives are shown on Figures 9 through 12.

4.2 Contaminant Source/Free Product Evaluation

4.2.1 Attenuation Capacity

While strong petroleum vapors were observed in soil borings, no free product was observed. The sum of the organic contaminant residual concentrations analyzed in soil samples collected at the site did not exceed 6,000 milligrams per kilogram for soils in the top one meter, or 2,000 milligrams per kilogram for soils below a depth of one meter at any of the sampling locations.

4.2.2 Soil Saturation Limits

The soil saturation limits for the contaminants of concern are provided on Table 4. The chemicals in which the melting point is less than 30°C were obtained from 35 IAC Part 742, Table A. None of the soil samples collected at the site exceeded the soil saturation limits for the volatile organic contaminants. For the semi-volatile organic contaminant, Naphthalene, saturation limits were calculated according to 35 IAC 742.220. None of the samples collected exceeded the calculated soil saturation limit for naphthalene.

4.2.3 Reactivity

Specific laboratory analysis for the purpose of evaluating the soil characteristic for reactivity as determined by 35 IAC 721.123 were not performed. Based on knowledge of the practices conducted at the site, the presence of sulfide or water reactive or explosive substances is not suspected.

4.2.4 pH

Specific field or laboratory analyses for soil pH were not performed. The range of pH in natural soils based on published data is expected to be between 6.0 and 8.0. Based on knowledge of practices conducted at the site, pH ranges less than 2, or greater than 12.5 are not suspected.

4.2.5 Toxicity

TCLP analysis of arsenic, barium, cadmium, chromium, lead, silver, selenium, and mercury were not performed. The soils at the site are not expected to exhibit the characteristics of toxicity for hazardous waste as determined by 35 IAC Part 721.124.

4.3 Exposure Route Evaluation

4.3.1 Inhalation Exposure Route Evaluation

The inhalation exposure route can not be totally excluded from further consideration at the FFTU site, since "inhalation" exposure technically applies to everything <10 ft below grade [Part 732.1105 (c)(3)(C)] and four (4) LUST samples (Lo23, L026, L030, and L032) exceed the residential inhalation standard of 800 mg/kg for Benzene. Two soil samples (L026 and L030) also exceed the construction worker inhalation standard of 2100 mg/kg for Benzene.

Table 3 lists the maximum soil and groundwater concentrations detected for the contaminants of concern The Tier 1 remediation objectives for the inhalation exposure route for residential and construction worker sites are provided for analysis in soil. The remediation objectives for the inhalation exposure route were exceeded for benzene only. The samples exceeding the remediation objective for soil inhalation were from depths greater than 3 feet, may be below groundwater during part or most of the upcoming years since the subsurface drainage system was removed in 1997.

4.3.2 Soil Ingestion Exposure Route Evaluation

The soil ingestion exposure route can be excluded from further consideration at the FFTU site. Table 3 lists the maximum soil concentrations detected for the contaminants of concern and the Tier 1 remediation objectives for the soil ingestion exposure route for both residential sites and for protection of construction workers. The remediation objective for soil ingestion at residential sites was not exceeded for the contaminants of concern.

4.3.3 Groundwater Ingestion Exposure Route

The groundwater ingestion exposure route cannot be excluded from ier 2 consideration. While no free product was encountered at the site, Tier 1 remediation objectives were exceeded for benzene and naphthalene. No existing water supply wells are known to be located within 2500 feet. The estimated areas where the groundwater concentrations exceed the groundwater ingestion exposure route remediation objectives are shown on Figures 7 and 8 respectively. Refer to the Tier 2 discussion Section 5.0 of this Report.

4.3.4 Groundwater Discharge to Surface Water

Groundwater from the FFTU area site flows to a point of discharge in the headwaters of Skokie Ditch. No surface water quality standards are available under 35 IAC Part 302 for the contaminants of concern. As previously stated, the concentration of benzene and naphthalene exceed the groundwater ingestion remediation objectives, which is further discussed in Section 5.0 of this Report. Benzene is the most restrictive of the contaminants of concern at the FFTU site with respect to remediation objectives. The U.S. EPA Superfund Ecotox threshold for benzene in fresh water is 46 micrograms per liter.

4.3.5 Soil Migration to Groundwater Exposure Route

The most restrictive soil exposure route is the soil migration to groundwater exposure route. The most restrictive of the contaminants of concern for that exposure route is benzene. The estimated areas where the soil concentrations exceed the soil migration to groundwater exposure route remediation objectives are shown on Figures 9 to 12. The estimated migration distance to contaminant attenuation is discussed in 5.0 of this Report.

5.0 TACO TIER 2 ANALYSIS

The results of the subsurface investigation indicate that the Tier 1 remediation objectives were exceeded for the soil inhalation, groundwater ingestion, and the soil migrating to groundwater routes of exposure. The extent of the soil and groundwater contamination were determined to be limited to the site. The purpose of the Tier 2 analysis is to evaluate if remediation is necessary for the protection of human health and the environment. The Tier 2 evaluation includes modeling to predict the concentrations of the constituents of concern at the point of compliance. For this site, the point of compliance is the only actual receptor, the headwaters of Skokie ditch on the West Side of the site. This is the point of groundwater discharge for contaminants migrating from the site.

5.1 Physical and Chemical Properties of the Constituent of Concern

The physical and chemical properties for the constituents of concern used in model calculations were taken from 35 IAC 742, Appendix C, Table E.

5.2 Soil Properties

Soil properties used for the model calculations was the default values in 35 IAC 742, Appendix C, Table D, with the exception of porosity. The most significant portion of groundwater migration will take place in the shallow sandy units, beneath the FFTU site. Porosity's measured in the geotechnical soils analysis for these units varied from .03 to .36. A value of .33 was used for the model calculations.

5.3 Exposure Route Evaluation

The soil ingestion route of exposure was eliminated in the Tier 1 evaluation. The soil inhalation, groundwater ingestion and soil migrating to groundwater routes of exposure were not eliminated in the Tier 1 evaluation and are discussed below.

5.3.1 Groundwater Ingestion

The model calculations for the groundwater ingestion route of exposure are provided in Appendix 5. The model calculations were performed according to 35 IAC 742, Appendix C, Table C. A steady-state attenuation model is used to calculate the concentrations of groundwater contaminants of concern downgradient of the source area. The source area is defined by the contour of the contaminant concentration equivalent to ½ of the maximum groundwater concentration detected.

The distribution of groundwater contaminants and the respective source areas closest to the point of compliance are shown in Figures 7 and 8. The model calculations predict that the concentrations of benzene and naphthalene will not exceed the Tier 1 remediation objectives for groundwater at the point of compliance. The contamination will therefore, not leave the site.

5.3.2 Soil Migrating Route of Exposure

The model calculations for soil migrating to groundwater route of exposure are provided in Appendix 5. The model calculations were performed according to 35 IAC 742, Appendix C, Table C. A soil leaching factor was calculated based on the soil physical properties and the width of the soil source area. Leaching factor was then applied to the soil concentrations in order to predict the resulting concentration of the groundwater source. The groundwater source was then modeled as in the groundwater ingestion pathway to predict the groundwater concentrations down gradient of the source.

The contamination source area is defined by the contour of the contaminant concentration equivalent to ½ of the maximum contaminant concentration detected for each constituent. The distribution of contaminants and their relative source areas closest to the point of compliance are shown in Figures 9 through 12. The model calculations predict that the concentrations of benzene, ethylbenzene, toulene and xylene in groundwater will not exceed the Tier 1 remediation objectives at the point of compliance. The contamination therefore, will not leave the site.

5.3.3 Soil Inhalation Route of Exposure

The remediation objectives for the inhalation exposure route were exceeded for benzene. The distribution of benzene in soil is shown on Figure 9. The samples exceeding the remediation objective for soil inhalation coincided with the exceedances for the soil migrating to groundwater route of exposure. The samples were collected near the former USTs and fuel lines associated with the southernmost training area from depths greater than 3 feet.

Prior to the piping demolition activities, the uppermost near-surface water table at the FFTU site was between 3 and 13 feet below grade. Current indications of water table depth are between 3 and 6 feet below grade. The removal of the subsurface drainage system has encouraged greater infiltration of rain water, and a higher detention time on site. The water table, in our estimation, will continue to rise to approximately 3 feet below grade or less, because the surrounding golf course has a groundwater level of 0 to 2 feet below grade (year round) except where specialty drainage has been employed. Because the water table is or will be above the soil contamination discussed above, an institutional control is not applicable for inhalation of benzene from soil below 3 feet of depth at the FFTU site.

Part 742 is not clear regarding inhalation standard for soil contamination below the groundwater, but it is reasonable to assume that migration soil contamination at or below the water table would be fully accounted for in the "soil leaching to groundwater" model/exposure rout. An institutional control as described in 742.1105 c)3)C) would appear to be applicable only if the water table remained 10 feet below grade.

5.4 Institutional Controls

Since the Tier 1 remediation objectives for groundwater ingestion and soil migrating to groundwater routes of exposure were exceeded on-site, Great Lakes Naval Training Center proposes institutional controls for site closure. The institutional controls will include a prohibition on the use of potable water supply wells and the drilling of new potable water supply wells on-site.

The institutional controls will cover the former FFTU site and portions of the golf course. The proposed institutional control areas are shown in Figure 13. The potable water supply well prohibition will extend to approximately 200' west of the stormwater discharge point on the headwaters of Skokie Ditch. The engineered barrier will be maintained in the future driving range area of the former FFTU Site. A copy of the proposed institutional control will be submitted to the IEPA for review prior to finalization. The current plan incudes submittal of the final institutional control document to the Office of The Recorder in Lake County, with copies on file with the Public Works Center, Southern Division Real Estate, Environmental n45, Utilities C600, NTC Facilities and Planning N41, and MWR (golf course operator. The institutional control document will be submitted as part of the request for site closure. Preparation of the final closure document is pending IEPA review of this Report.

6.0 SUMMARY AND CONCLUSIONS

A subsurface investigation was performed at the subject site to evaluate the extent of soil and groundwater contamination. Investigation included cone penetrometer testing, soil and groundwater sampling and installation and testing of monitoring wells. Over two hundred fifty (250) soil samples, fifty-three (53) groundwater samples, four (4) sediment samples and four (4) surface water samples were collected as part of the investigation.

The results of the CPT and shallow direct push soil sample investigation indicate that the site is covered by a shallow sandy soil or fill materials averaging approximately 15' in depth. Beneath the shallow sand is an impermeable clay till or diamicton unit. The CPT data indicates that the diamicton units have very low permeability. The potentiometric data for the monitoring wells at the site indicate that the groundwater flow is from east to west, discharging to the headwaters of Skokie Ditch. The water level has been rising due to the removal of the subsurface drainage system.

One hundred eighty-four (184) soil samples, seventeen (17) groundwater samples, four (4) sediment samples and four (4) surface water samples were submitted to the laboratory for analysis. The analytical results were compared to the TACO Tier 1 remediation objectives. The Tier 1 remediation objectives for groundwater ingestion were exceeded for benzene and naphthalene; and the Tier 1 remediation objectives for migration to groundwater were exceeded for benzene, ethylbenzene, toulene and xylene. The contamination appeared to be associated with the former underground storage tank (UST) area and product fuel line areas on-site. The contamination was limited to the shallow sands above the first diamicton.

A Tier 2 analysis was performed in order to evaluate the potential for contamination to migrate off-site. Model calculations in the Tier 2 analysis predicted that contamination will not migrate off-site and will not exceed the Tier 1 remediation objectives at the headwaters of Skokie ditch.

Since the contamination will not migrate off-site, no remediation is proposed. Since the Tier 1 remediation objectives were exceeded, Great Lakes Naval Training Center intends to impose an institutional control and prohibit the installation and use of potable water supply wells on the former FFTU site and portions of the golf course. The institutional control documents will be submitted as part of the request for site closure, pending IEPA review of this Report.

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: _____ Well No.: MW- 1 -98

Site Name: Fire Fighting Training Unit Date Drilled Start: 10-14-97

Drilling Contractor: Soilprobe, Inc Date Completed: 10-14-97

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

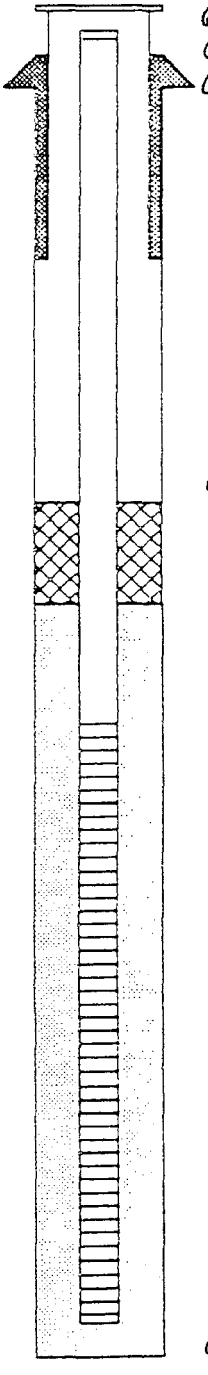
Measurements

to .01 ft (where applicable)

Riser pipe length	2'
Screen length	10' Prepacked w/Sand
Screen slot size	0.01
Protective casing length	N/A
Depth to water	2.49'
Elevation of water	689.04
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



691.71 Top of Protective Casing

691.53 Top of Riser Pipe

691.71 Ground Surface

690.53 Top of Annular Sealant

0 Casing Stickup

690.53 Top of Seal

.5 Total Seal Interval

690.03 Top of Sand

689.53 Top of Screen

10 Total Screen Interval

679.53 Bottom of Screen

679.53 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW- 6 -98

Site Name: Fire Fighting Training Unit Date Drilled Start: 10-6-97

Drilling Contractor: Soilprobe, Inc Date Completed: 10-6-97

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

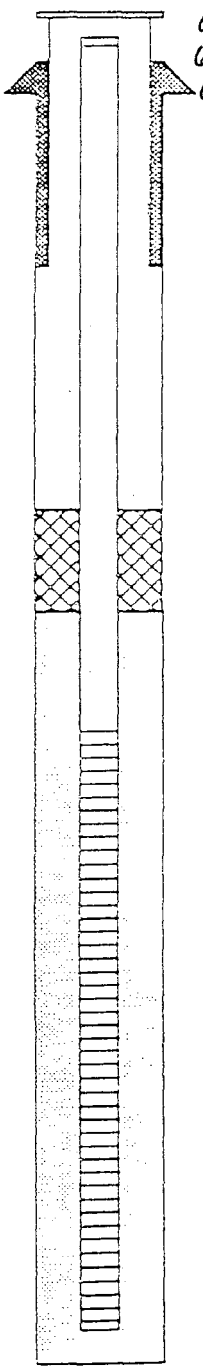
Measurements

to .01 ft (where applicable)

Riser pipe length	3'
Screen length	10'
Screen slot size	0.01
Protective casing length	N/A
Depth to water	1.55'
Elevation of water	687.73
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



689.61 Top of Protective Casing

689.28 Top of Riser Pipe

689.61 Ground Surface

688.03 Top of Annular Sealant

0 Casing Stickup

688.03 Top of Seal

.75 Total Seal Interval

687.28 Top of Sand

686.28 Top of Screen

10 Total Screen Interval

676.28 Bottom of Screen

676.28 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: _____ Well No.: MW-12-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 1-27-98

Drilling Contractor: Soilprobe, Inc Date Completed: 1-27-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

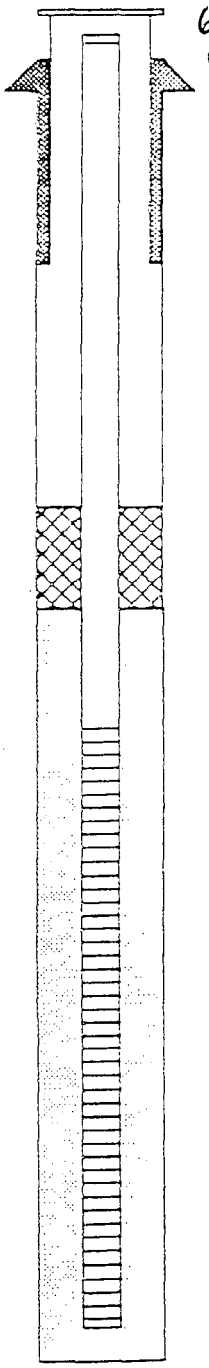
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements to .01 ft (where applicable)

Riser pipe length	4" ~ 5.5'
Screen length	10'
Screen slot size	0.01
Protective casing length	@ 5'
Depth to water	4.53'
Elevation of water	689.15
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



693.87 Top of Protective Casing
693.68 Top of Riser Pipe
690.21 Ground Surface
690.21 Top of Annular Sealant
3.66 Casing Stickup

690.21 Top of Seal
1 Total Seal Interval
689.21 Top of Sand

688.21 Top of Screen

10 Total Screen Interval

678.21 Bottom of Screen
678.21 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-14-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 1-27-98

Drilling Contractor: Soilprobe, Inc Date Completed: 1-27-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

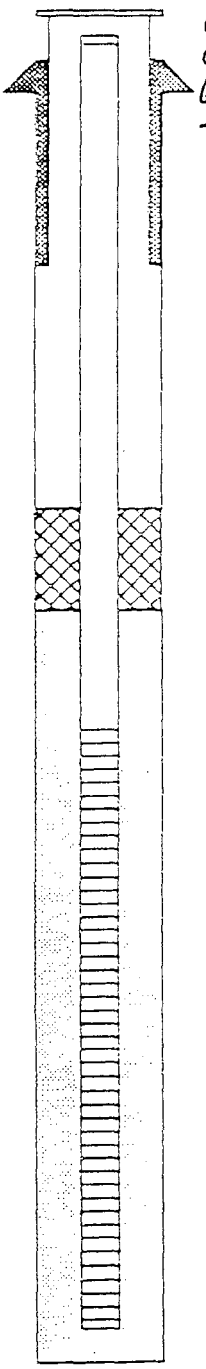
Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Elevations - .01 ft.

692.27 Top of Protective Casing
691.32 Top of Riser Pipe
688.98 Ground Surface
687.98 Top of Annular Sealant
-3.29 Casing Stickup



687.89 Top of Seal
1 Total Seal Interval
686.98 Top of Sand
685.98 Top of Screen
9 Total Screen Interval
676.98 Bottom of Screen
676.98 Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements

to .01 ft (where applicable)

Riser pipe length	~~10~~ ~4'
Screen length	9'
Screen slot size	0.01
Protective casing length	@ 5'
Depth to water	3.54
Elevation of water	687.78
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J. ELGIN

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-16-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 1-27-98

Drilling Contractor: Soilprobe, Inc Date Completed: 1-27-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements

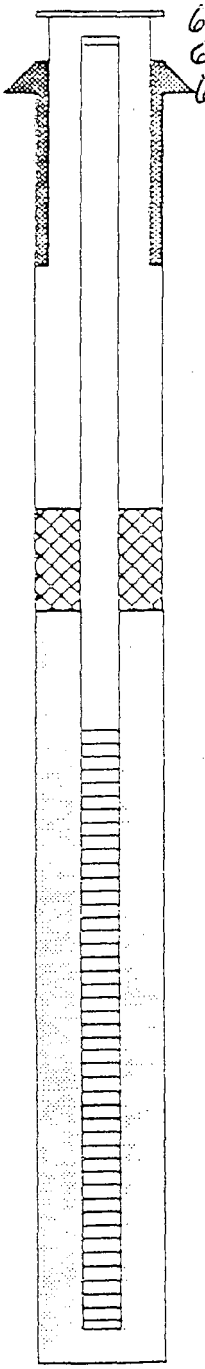
to .01 ft (where applicable)

Riser pipe length	27'
Screen length	8'
Screen slot size	0.01
Protective casing length	5'
Depth to water	4.34'
Elevation of water	685.92
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R. J. E

Elevations - .01 ft.

691.15 Top of Protective Casing
690.26 Top of Riser Pipe
687.93 Ground Surface
685.43 Top of Annular Sealant
3.22 Casing Stickup



685.93 Top of Seal
1 Total Seal Interval
684.93 Top of Sand
683.93 Top of Screen
8 Total Screen Interval
675.93 Bottom of Screen
675.93 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-17-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 1-28-98

Drilling Contractor: Soilprobe, Inc Date Completed: 1-28-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

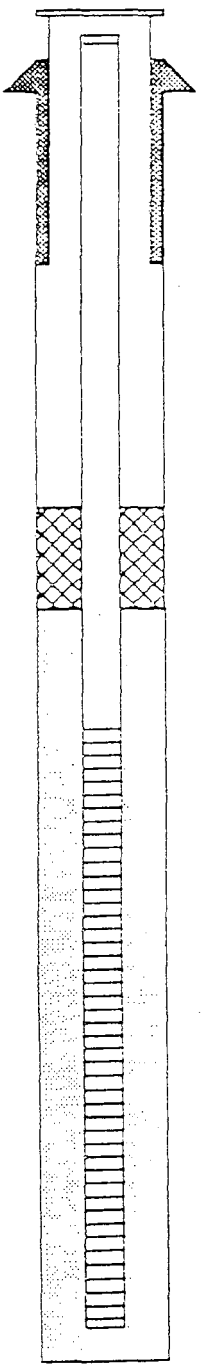
Measurements

to .01 ft (where applicable)

Riser pipe length	6'
Screen length	9'
Screen slot size	0.01
Protective casing length	5'
Depth to water	8.84'
Elevation of water	682.04
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



_____ Top of Protective Casing

_____ Top of Riser Pipe

_____ Ground Surface

_____ Top of Annular Sealant

_____ Casing Stickup

_____ Top of Seal

_____ Total Seal Interval

_____ Top of Sand

_____ Top of Screen

_____ Total Screen Interval

_____ Bottom of Screen

_____ Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-20-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 1-28-98

Drilling Contractor: Soilprobe, Inc Date Completed: 1-28-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

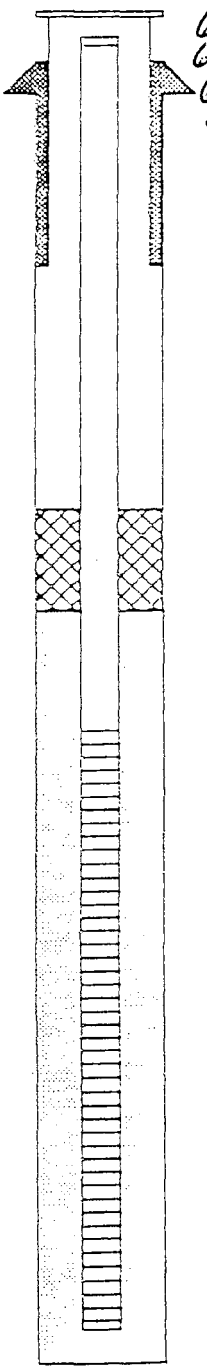
Measurements

to .01 ft (where applicable)

Riser pipe length	26.5'
Screen length	9'
Screen slot size	0.01
Protective casing length	5'
Depth to water	4.93'
Elevation of water	685.82
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



691.49 Top of Protective Casing

690.75 Top of Riser Pipe

688.03 Ground Surface

687.03 Top of Annular Sealant

3.46 Casing Stickup

687.03 Top of Seal

1 Total Seal Interval

686.03 Top of Sand

685.03 Top of Screen

9 Total Screen Interval

676.03 Bottom of Screen

676.03 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-25-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 1-29-98

Drilling Contractor: Soilprobe, Inc Date Completed: 1-29-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

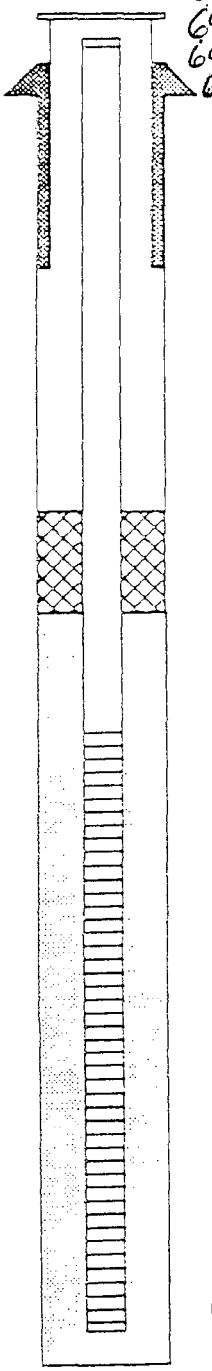
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements to .01 ft (where applicable)

Riser pipe length	6'
Screen length	10'
Screen slot size	0.01
Protective casing length	.75
Depth to water	7.23'
Elevation of water	682.99
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: RJE

Elevations - .01 ft.



690.45 Top of Protective Casing

690.22 Top of Riser Pipe

690.45 Ground Surface

688.45 Top of Annular Sealant

0 Casing Stickup

688.45 Top of Seal

3 Total Seal Interval

685.45 Top of Sand

684.45 Top of Screen

10 Total Screen Interval

674.45 Bottom of Screen

674.45 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-26-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 1-29-98

Drilling Contractor: Soilprobe, Inc Date Completed: 1-29-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

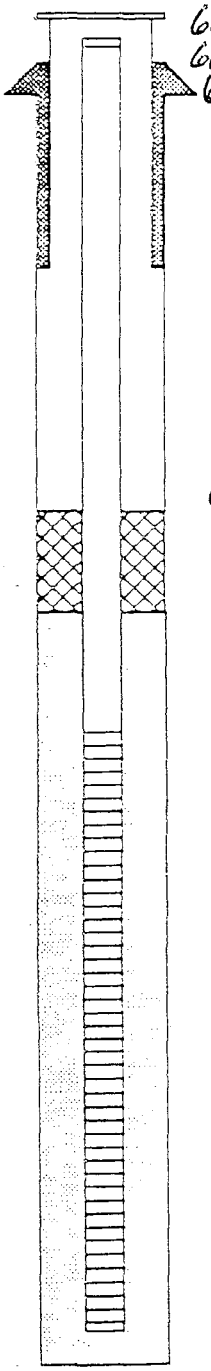
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements to .01 ft (where applicable)

Riser pipe length	3'
Screen length	9'
Screen slot size	0.01
Protective casing length	.75
Depth to water	-0.18
Elevation of water	684.36
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E

Elevations - .01 ft.



684.36 Top of Protective Casing

684.18 Top of Riser Pipe

684.36 Ground Surface

683.36 Top of Annular Sealant

0 Casing Stickup

683.36 Top of Seal

2 Total Seal Interval

681.86 Top of Sand

681.36 Top of Screen

9 Total Screen Interval

672.36 Bottom of Screen

672.36 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-29 -98

Site Name: Fire Fighting Training Unit Date Drilled Start: 1-30-98

Drilling Contractor: Soilprobe, Inc Date Completed: 1-30-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

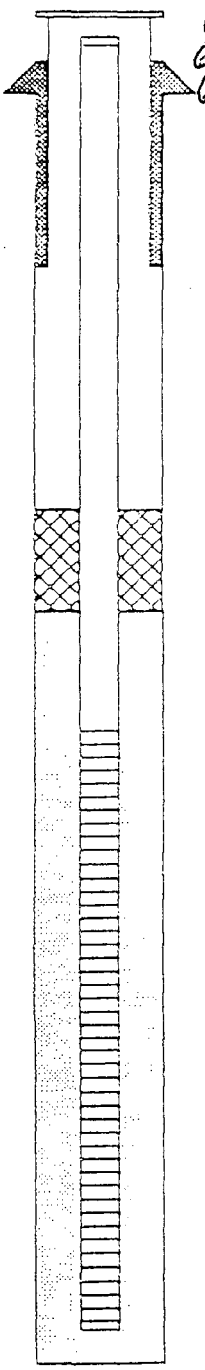
Measurements

to .01 ft (where applicable)

Riser pipe length	3'
Screen length	9'
Screen slot size	0.01
Protective casing length	.75'
Depth to water	2.76'
Elevation of water	686.04
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



689.14 Top of Protective Casing

688.80 Top of Riser Pipe

689.14 Ground Surface

688.14 Top of Annular Sealant

0 Casing Stickup

688.14 Top of Seal

1 Total Seal Interval

687.14 Top of Sand

686.14 Top of Screen

9 Total Screen Interval

677.14 Bottom of Screen

677.14 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: ______

Site Name: Fire Fighting Training Unit

Drilling Contractor: Soilprobe, Inc

Driller: Andrew

Drilling Method: Direct Push

Well No.: MW- 30 -98

Date Drilled Start: 1-30-98

Date Completed: 1-30-98

Geologist: Fred Lawrence/Rick Elgin

Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

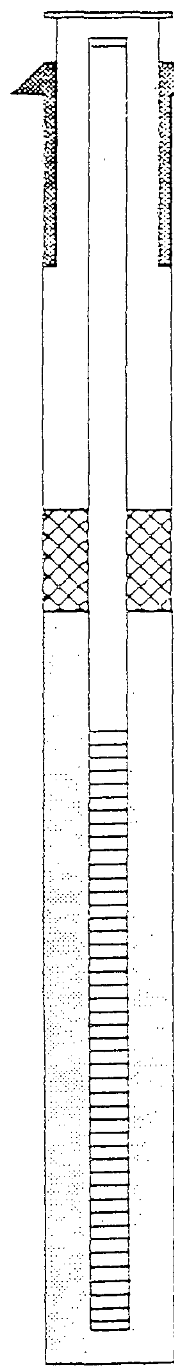
Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Elevations - .01 ft.

688.16 Top of Protective Casing
687.89 Top of Riser Pipe
688.16 Ground Surface
686.16 Top of Annular Sealant
0 Casing Stickup



686.16 Top of Seal
3 Total Seal Interval
683.16 Top of Sand
682.16 Top of Screen
10' Total Screen Interval
672.16 Bottom of Screen
672.16 Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements

to .01 ft (where applicable)

Riser pipe length	6'
Screen length	10'
Screen slot size	0.01"
Protective casing length	.75'
Depth to water	1.62'
Elevation of water	686.27
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-34-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 2-3-98

Drilling Contractor: Soilprobe, Inc Date Completed: 2-3-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

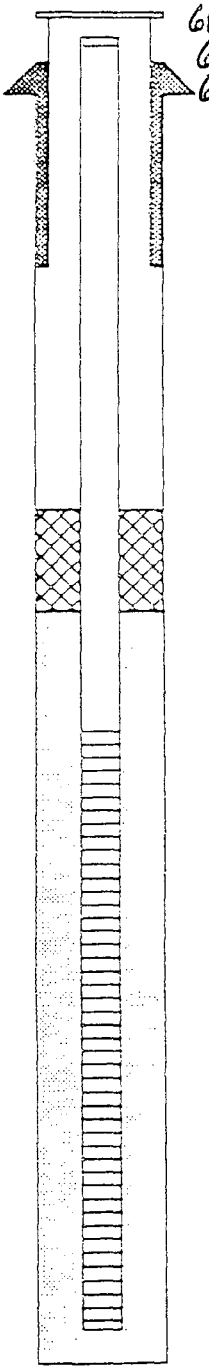
Measurements

to .01 ft (where applicable)

Riser pipe length	2'
Screen length	9'
Screen slot size	0.01
Protective casing length	.75
Depth to water	0.65'
Elevation of water	683.70
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



684.60 Top of Protective Casing

684.35 Top of Riser Pipe

684.60 Ground Surface

683.60 Top of Annular Sealant

0 Casing Stickup

683.60 Top of Seal

.5 Total Seal Interval

683.10 Top of Sand

682.60 Top of Screen

9 Total Screen Interval

673.60 Bottom of Screen

673.60 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-35-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 2-4-98

Drilling Contractor: Soilprobe, Inc Date Completed: 2-4-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

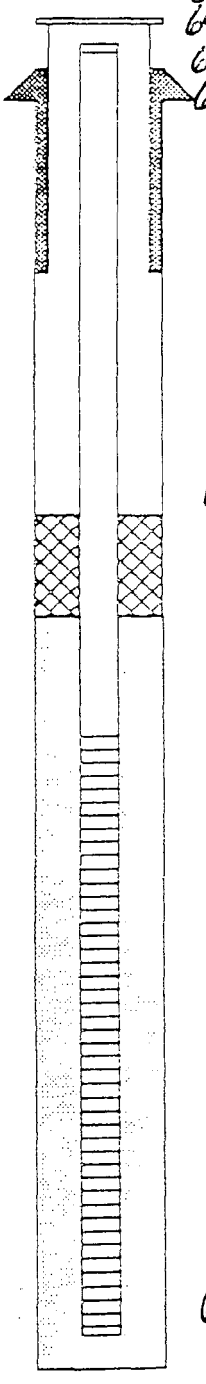
Measurements

to .01 ft (where applicable)

Riser pipe length	3'
Screen length	5'
Screen slot size	0.01"
Protective casing length	.75'
Depth to water	1.32
Elevation of water	689.56
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E

Elevations - .01 ft.



691.08 Top of Protective Casing

690.88 Top of Riser Pipe

691.08 Ground Surface

690.08 Top of Annular Sealant

0 Casing Stickup

690.08 Top of Seal

1.5 Total Seal Interval

688.58 Top of Sand

688.08 Top of Screen

5 Total Screen Interval

683.08 Bottom of Screen

683.08 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-36-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 2-3-98

Drilling Contractor: Soilprobe, Inc Date Completed: 2-3-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

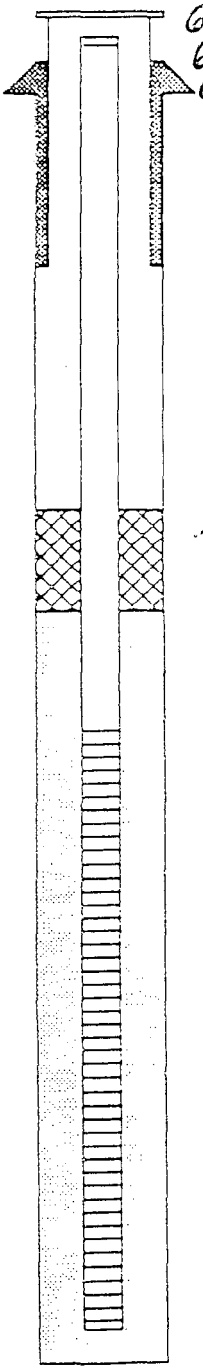
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements to .01 ft (where applicable)

Riser pipe length	3'
Screen length	5'
Screen slot size	0.01"
Protective casing length	3.75
Depth to water	2.44'
Elevation of water	693.46
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



696.13 Top of Protective Casing
695.90 Top of Riser Pipe
696.13 Ground Surface
695.13 Top of Annular Sealant
0 Casing Stickup

695.13 Top of Seal
~1.5 Total Seal Interval
693.53 Top of Sand

693.13 Top of Screen

5 Total Screen Interval

688.13 Bottom of Screen
688.13 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-39-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 2-4-98

Drilling Contractor: Soilprobe, Inc Date Completed: 2-4-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements

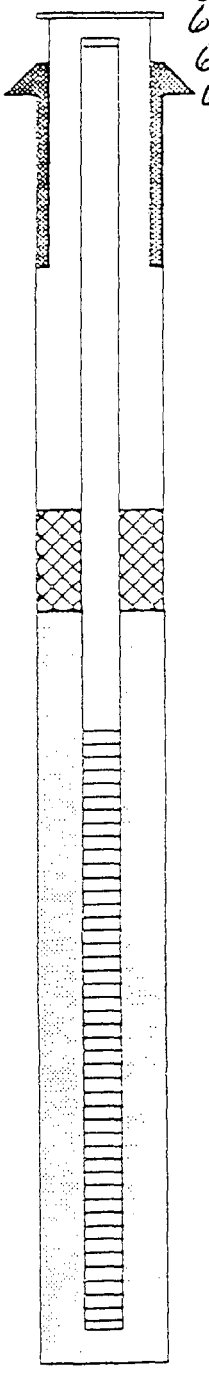
to .01 ft (where applicable)

Riser pipe length	3'
Screen length	9'
Screen slot size	0.01"
Protective casing length	.75'
Depth to water	2.24'
Elevation of water	690.83
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.

693.24 Top of Protective Casing
693.07 Top of Riser Pipe
693.24 Ground Surface
692.24 Top of Annular Sealant
0 Casing Stickup



692.24 Top of Seal
1.5 Total Seal Interval
690.74 Top of Sand

690.24 Top of Screen

9 Total Screen Interval

681.24 Bottom of Screen
681.24 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-38-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 2-4-98

Drilling Contractor: Soilprobe, Inc Date Completed: 2-4-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

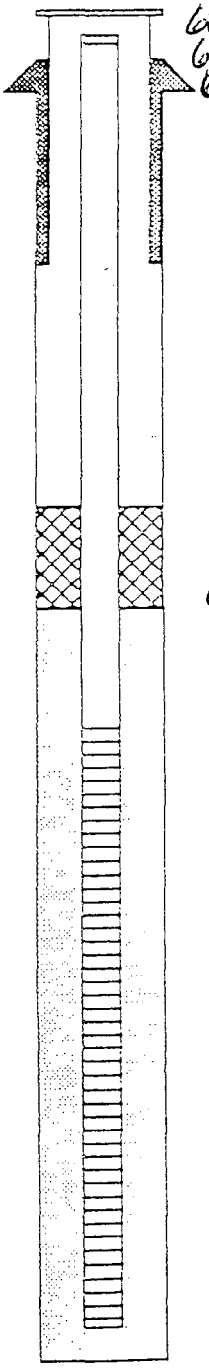
Measurements

to .01 ft (where applicable)

Riser pipe length	4'
Screen length	5'
Screen slot size	0.01"
Protective casing length	.75
Depth to water	0.8
Elevation of water	686.73
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



687.78 Top of Protective Casing

687.53 Top of Riser Pipe

687.78 Ground Surface

686.78 Top of Annular Sealant

0 Casing Stickup

686.78 Top of Seal

2 Total Seal Interval

684.78 Top of Sand

683.78 Top of Screen

5 Total Screen Interval

678.78 Bottom of Screen

678.78 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: MW-41-98

Site Name: Fire Fighting Training Unit Date Drilled Start: 2-5-98

Drilling Contractor: Soilprobe, Inc Date Completed: 2-5-98

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

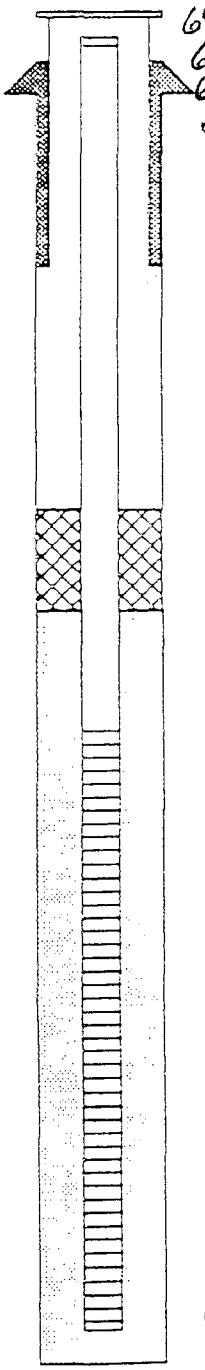
Measurements

to .01 ft (where applicable)

Riser pipe length	6.5'
Screen length	9'
Screen slot size	0.01"
Protective casing length	5'
Depth to water	4.08'
Elevation of water	689.16
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	1" PVC

Completed by: R.J.E.

Elevations - .01 ft.



693.58 Top of Protective Casing

693.24 Top of Riser Pipe

690.19 Ground Surface

689.19 Top of Annular Sealant

3.39 Casing Stickup

689.19 Top of Seal

1.6 Total Seal Interval

687.59 Top of Sand

687.19 Top of Screen

9 Total Screen Interval

678.19 Bottom of Screen

678.19 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: CPZ-001

Site Name: Fire Fighting Training Unit Date Drilled Start: _____

Drilling Contractor: Soilprobe, Inc Date Completed: _____

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

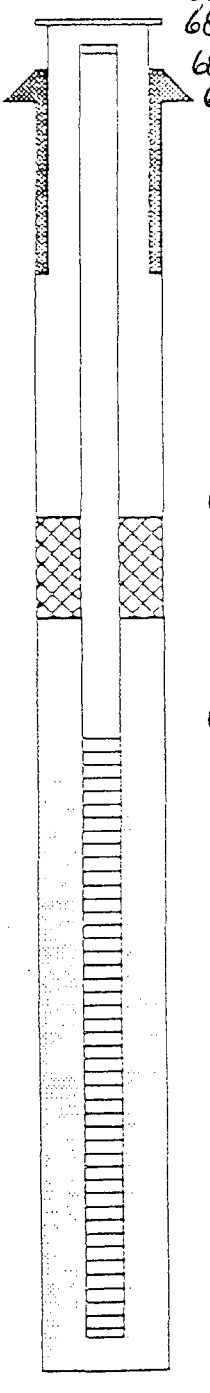
Measurements to .01 ft (where applicable)

Riser pipe length	35'
Screen length	5'
Screen slot size	0.01
Protective casing length	.75'
Depth to water	23.81'
Elevation of water	665.40
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	.75" PVC

Completed by: R.S.E

Elevations - .01 ft.

689.26 Top of Protective Casing
689.21 Top of Riser Pipe
689.26 Ground Surface
688.26 Top of Annular Sealant
0 Casing Stickup



688.26 Top of Seal
32 Total Seal Interval
656.26 Top of Sand
654.26 Top of Screen
5 Total Screen Interval
649.26 Bottom of Screen
649.26 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: ______

Well No.: CPZ-002

Site Name: Fire Fighting Training Unit

Date Drilled Start: ______

Drilling Contractor: Soilprobe, Inc

Date Completed: ______

Driller: Andrew

Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push

Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Elevations - .01 ft.

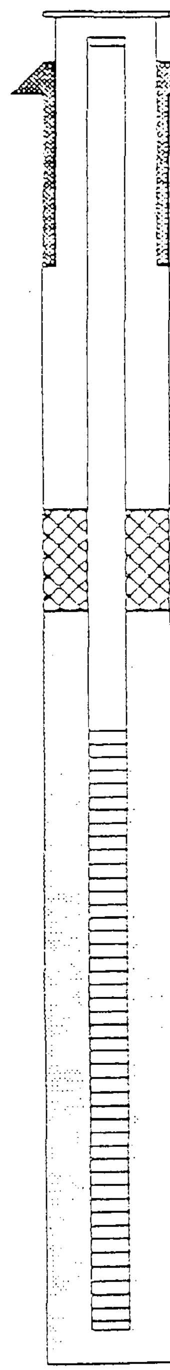
688.69 Top of Protective Casing

688.66 Top of Riser Pipe

688.69 Ground Surface

687.69 Top of Annular Sealant

0 Casing Stickup



687.69 Top of Seal

30 Total Seal Interval

657.69 Top of Sand

655.69 Top of Screen

5 Total Screen Interval

650.69 Bottom of Screen

650.69 Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements

to .01 ft (where applicable)

Riser pipe length	33'
Screen length	5'
Screen slot size	0.01"
Protective casing length	.75'
Depth to water	24.75'
Elevation of water	663.91
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	.75" PVC

Completed by: RJ.E

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: CPZ-005

Site Name: Fire Fighting Training Unit Date Drilled Start: _____

Drilling Contractor: Soilprobe, Inc Date Completed: _____

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

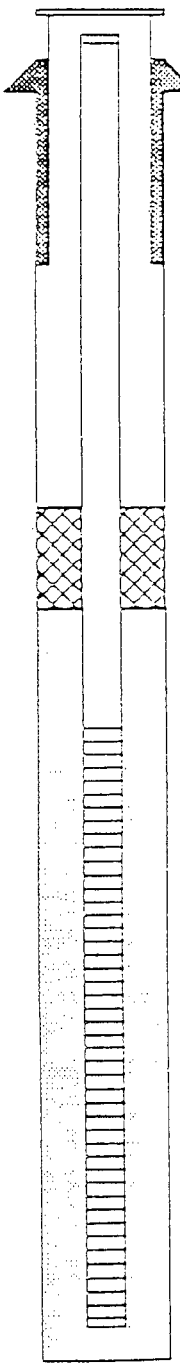
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements to .01 ft (where applicable)

Riser pipe length	42'
Screen length	5'
Screen slot size	0.01
Protective casing length	.75'
Depth to water	23.02
Elevation of water	666.36
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	.75" PVC

Completed by: R.J.E

Elevations - .01 ft.



689.59 Top of Protective Casing

689.38 Top of Riser Pipe

689.59 Ground Surface

688.59 Top of Annular Sealant

0 Casing Stickup

688.59 Top of Seal

39 Total Seal Interval

649.59 Top of Sand

647.59 Top of Screen

5 Total Screen Interval

642.59 Bottom of Screen

642.59 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: _____ Well No.: CPZ-008

Site Name: Fire Fighting Training Unit Date Drilled Start: _____

Drilling Contractor: Soilprobe, Inc Date Completed: _____

Driller: Andrew Geologist: Fred Lawrence/Rick Elgin

Drilling Method: Direct Push Drilling Fluids (type): None

Annular Space Details

Type of Surface Seal: Concrete

Type of Annular Sealant: Bentonite

Type of Bentonite Seal (Granular, Pellet): Granular-Hydrated

Type of Sand Pack: Silica

Well Construction Materials

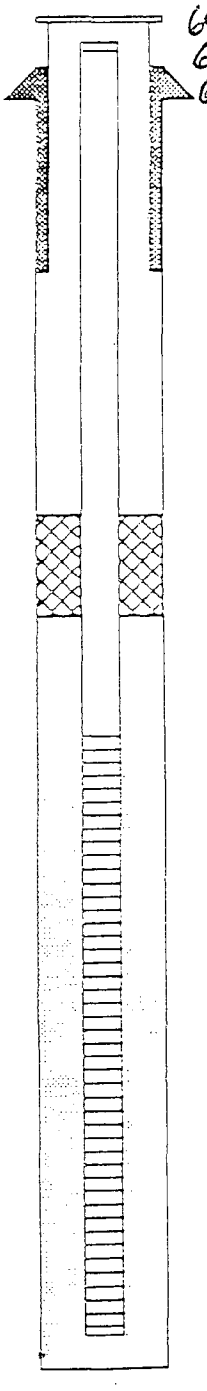
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		X	
Riser pipe below w.t.		X	
Screen		X	
Coupling joint screen to riser		X	
Protective casing	X		

Measurements to .01 ft (where applicable)

Riser pipe length	38'
Screen length	5'
Screen slot size	0.01"
Protective casing length	75'
Depth to water	27.63'
Elevation of water	663.95
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	
Other	.75" PVC

Completed by: R.J.E.

Elevations - .01 ft.



691.64 Top of Protective Casing

691.58 Top of Riser Pipe

691.64 Ground Surface

690.64 Top of Annular Sealant

0 Casing Stickup

690.64 Top of Seal

35 Total Seal Interval

655.64 Top of Sand

653.64 Top of Screen

5 Total Screen Interval

648.64 Bottom of Screen

648.64 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

IL 532-2274
LPC 500 Dec-96