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Installation Restoration Program
Phase II — Confirmation/Quantification
Stage 1

Dover Air Force Base
Dover, Delaware 19901

Science Applications International Corporation
8400 Westpark Drive, McLean, VA 22102

June 1986

Final Report 9/84 to 6/86
Volume 2 — Appendices

Prepared for
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APPENDIX A: Glossary

GLOSSARY

AFB: Air Force Base.

AFESC: Air Force Engineering and Services Center.

Ag: Silver.

Air Surging: A procedure for developing wells whereby compressed air is pumped down a well and allowed to bubble up through the water column in the well.

ALS: Above land surface.

Annular Space: The space between a borehole and the outside of a well screen or casing.

Aquifer: A geologic formation, group of formations, or part of a formation that is capable of yielding water to a well or spring.

As: Arsenic.

Auger: A screwlike boring tool resembling a carpenter's auger bit but much larger, usually motor-driven, designed for use in clay, soil, and other relatively unconsolidated near-surface materials.

Bailer Wash: A sample of distilled water poured through the bailer that is analyzed to evaluate decontamination procedures.

Blow Count: The total of the number of strikes with a freefalling weight needed to drive a sampler a given distance into the ground.

BLS: Below land surface.

Braided Channel: Channel created by a stream flowing in several dividing and reuniting channels, creating a netlike pattern.

BW: Bailer wash.

Cd: Cadmium.

Channel: An abandoned or buried water course represented by deposits of sand or gravel.

Clay: Fine-grained aggregate consisting wholly or dominantly of microscopic and submicroscopic mineral particles.

CN: Cyanide.

Coalesce: The union of individual streams into a single stream or braided stream.

Coastal Plains: Physiographic province of the Eastern United States characterized by a gently seaward sloping surface formed over exposed, unconsolidated, stratified marine fluvial sediments. Typical coastal plain features include low hills and ridges, organic deposits, flood-plains, and high water tables.

Cone of Depression: The depression, roughly conical in shape, produced in a water table or potentiometric surface, by pumping or artesian flow.

Confining bed, layer, or unit: Body of impermeable or distinctly less permeable material stratigraphically adjacent to one or more aquifers.

Cr: Chromium.

Cross-section: Geologic diagram or actual field exposure showing the geologic formations and structures transected by a given plane.

Cu: Copper.

CWA-WQC: Clean Water Act Quality Criteria for Human Health.

DAFB: Dover Air Force Base.

Differential Subsidence: The relative change in how materials subside over time which results in uneven surfaces developing.

Diffusion: The spreading out of molecules, atoms, or ions into a porous medium in a direction tending to equalize concentrations in all parts of the system.

Dip: Angle at which a stratum or any planar feature is inclined from the horizontal.

Discharge: As it pertains to groundwater; the flow of groundwater directly from the zone of saturation onto land or into a surface water body.

DNREC: Delaware Department of Natural Resources and Environmental Control.

DOD: Department of Defense.

Downgradient: In the direction of decreasing hydraulic static head; the direction in which groundwater flows.

Drawdown: A lowering of the water table or potentiometric surface caused by pumping of groundwater from wells.

EDM: Electronic distance meter.

Effective Porosity: The amount of interconnected pore space through which fluids can pass.

EPA: The U.S. Environmental Protection Agency.

EPA Method 601: GC test method for the determination of 29 purgeable halocarbons.

EPA Method 602: GC test method for determination of 7 purgeable aromatics.

EPA Method 624: GC/MS test method for the determination of volatile organic compounds amenable to the purge and trap method.

EPA Method 624 (modified): The same as the standard 624 test but with an extra purge and trap to detect hydrocarbons in fuels lighter than kerosene.

EPA Method 625 (extractables): GC/MS test method for the determination of organic compounds that are solvent extractable. Extractable fractions include base/neutral and acid extractables.

EPA Method 625 (Pesticides and PCB's): Same as for 625 (extractable) test but for pesticide and PCB extractables.

Facies: A stratigraphic body as distinguished from other bodies of different appearance or composition.

Fb: Field blank.

Fe: Iron.

FIT: Field investigation team.

Field Blank: A sample of distilled water that is analyzed to determine if the distilled water contains contaminants that could be introduced to sampling equipment and ultimately to the samples through decontamination processes.

Field Duplicate: A sample of any media collected at the same time and place as the identified media sample. Duplicate samples are analyzed to indicate the overall precision of sampling and analytical procedures.

Flow Path: The direction or movement of groundwater as governed principally by the hydraulic gradient.

Ft: Feet.

Ft/day: Feet/day.

Glauconitic Sand and Gravel: A mixture of sand, gravel, and glauconite, an iron-potassium silicate mineral which imparts a green color to the mixture.

gpd: Gallons per day.

gpm: Gallons per minute.

Groundwater: Subsurface water in a zone of saturation.

Groundwater Divide: A line on a water table on each side of which the water table slopes downward in a direction away from the line.

Hard Stand: Parking area or ramp adjacent to taxiway where aircraft are parked or stored.

HARM: Hazard Assessment Rating Methodology.

Head Level: The height of a vertical column of water; dependent upon hydrostatic pressure.

Hg: Mercury.

Hydraulic Conductivity: A coefficient of proportionality describing the rate at which water can move through a permeable medium.

Hydraulic Gradient: The change in total head with a change in distance in a given direction. The direction is that which yields a maximum rate of decrease in head.

Hydraulic Rotary: The hydraulically driven drilling method which rotates the drill pipe and bit while circulating fluid under pressure to force cuttings to the surface.

Hydrograph: A graph showing stage (level), flow or velocity of water with respect to time.

IRP: Installation Restoration Program.

IW: Industrial waste water.

JP-4: Jet propulsion fuel No. 4

K: Hydraulic conductivity.

Laboratory Replicate: An aliquot or split of an actual sample. Replicate or split samples are analyzed to document the precision of the analytical method.

Leachate: A solution resulting from the separation or dissolving of soluble or particulate constituents from solid waste or other man-placed medium by percolation of water.

Leaching: The process by which soluble materials in the soil, such as nutrients, pesticide chemicals, or contaminants, are washed into a lower layer of soil or are dissolved and carried away by water.

Lens: Body of rock material bounded by converging surfaces, at least one of which is curved.

MAC: Military Airlift Command.

Marl: Incoherent sands consisting of calcareous clays and particles of calcite or dolomite.

MATS: Military Air Transport Service.

MCL: Safe Drinking Water Act Maximum Contaminant Levels.

MGD: Million gallons per day.

mg/l: Milligrams per liter.

Miocene: The fourth of the five epochs of the Tertiary period. The Miocene occurred between approximately 12 and 26 million years ago.

ml: Milliliters.

Mn: Manganese.

MoGas: Motor gasoline.

Monitoring Well: A well used to measure groundwater levels and to obtain samples.

MSL: Mean Sea Level.

Net Precipitation: The amount of annual precipitation minus annual evaporation.

Ni: Nickel.

NPL: National Priorities List of Hazardous Waste Sites.

O&G: Oil and Grease.

Organic: Being, containing, or relating to carbon compounds, especially in which hydrogen is attached to carbon.

Outcrop: Part of a body of rock that appears bare and exposed at the surface of the ground.

Pb: Lead.

PCB: Polychlorinated Biphenyls; liquids used as a dielectric in electrical equipment.

PCE: Perchloroethylene, tetrachloroethylene, or tetrachloroethene.

PD-680: Cleaning solvent.

Permeability: The capacity of a porous rock, soil, or sediment for transmitting a fluid without damage to the structure of the medium.

pH: Negative logarithm of hydrogen ion concentration.

Pleistocene: First epoch of the Quaternary period, in general including the time and deposits of the last great glacial epoch.

Potentiometric Surface: A surface that represents the level to which water will rise in tightly cased wells. The water table is a particular potentiometric surface for an unconfined aquifer.

POC: Purgeable Organic Carbon.

Poorly Sorted: Having a poor degree of similarity in terms of grain size within a mass of material.

Porosity: Property of a rock containing interstices without regard to size, shape, intercommunication, or arrangement of openings.

ppb: Parts per billion.

ppm: Parts per million.

Priority Pollutant: One of 119 compounds that have been identified as hazardous in waters by EPA.

Priority Pollutant Scan: A series of tests to determine the presence of all priority pollutants.

Priority Pollutant Organics: The organic priority pollutant compounds identifiable by EPA methods 624 and 625.

Purging: Withdrawing a predetermined amount of water from a groundwater monitoring well prior to collecting samples. Purging is performed to ensure representative samples of the groundwater are collected.

Recharge: Processes by which water is absorbed and is added to the zone of saturation, either directly into a formation, or indirectly by way of another formation.

Regressing: The lowering of the sea level or retreating of the shoreline seaward.

SAC: Strategic Air Command.

SAIC: Science Applications International Corporation.

SNARLS: Safe Drinking Water Act Suggested No Adverse Response Limits Health Advisories.

SOW: Statement of Work.

Specific Capacity: An expression of the productivity of a well, obtained by dividing the rate of discharge of water from the well by the drawdown of the water level in the well.

Specific Gravity: The ratio of the mass of a body to the mass of an equal volume of water at 4°C or other specified temperature.

Specific Yield: The ratio of the volume of water a rock or soil will yield by gravity drainage to the volume of the rock or soil.

Split Spoon: A type of soil sampler consisting of a length of hollow tubing split lengthwise and threaded at both ends. A drive head and a coupling hold the two halves together. The sampler is pounded into the soil a set distance. The sample is examined by removing the drive head and coupling and opening the split barrel.

Strike: The direction of a horizontal line in the plane of an inclined stratum, joint, fault, cleavage plane, or other structure; perpendicular to the direction of dip.

Subcrop: Area within which a formation occurs directly beneath an unconformity.

TAC: Tactical Air Command.

TCE: Trichloroethylene or trichloroethene.

TOC: Total Organic Carbon.

TOX: Total Organic Halogens.

Transgressing: The raising of sea level or advancing of the shoreline landward.

Transmissivity: The rate at which water of a prevailing density and viscosity is transmitted through a unit width of an aquifer or confining bed under a unit hydraulic gradient. Transmissivity can be calculated by multiplying the hydraulic conductivity by the aquifer's saturated thickness.

ug/l: Micrograms per liter.

Undulating Surface: Smooth but irregular surface of bedding planes or contacts commonly formed by differential erosion or differential compaction.

Upgradient: In the direction of increasing hydraulic static head; the direction opposite to the prevailing flow of groundwater.

USAF: United States Air Force.

USAFOEHL: United States Air Force Occupational and Environmental Health Laboratory.

USAFOEHL LOC: USAFOEHL Levels of Concern.

USEPA CAG: USEPA Carcinogenic Assessment Group.

USGS: United States Geological Survey.

v: Velocity.

VOA: Volative Organics Analysis.

VOC: Volative Organic Compounds identified by EPA Methods 601 and 602.

Water Table: Upper surface of a zone of saturation except where that surface is formed by an impermeable body.

Well Log: Systematic and sequential record of geologic data obtained from a well.

Well Point: A well that is commonly installed by driving the casing and screen into the ground pneumatically or by the combined action of rotating the casing and screen while injecting water under pressure to flush out cuttings.

WTP: Waste water treatment plant.

Zn: Zinc.

APPENDIX B: Scope of Work

Installation Restora[illegible]

Phase II Field Eval[illegible]

Dover AFB DE

I. Description of Work

The purpose of this task is to determine if environmental [illegible] has resulted from waste disposal practices, fuel spills and fire training activities at Dover AFB DE; to provide estimates of the magnitude and extent of contamination, should contamination be found; to identify potential environmental consequences of migrating pollutants; to identify any additional investigations and their attendant costs necessary to properly evaluate the magnitude, extent, and direction of movement of discovered contaminants.

Ambient air monitoring of hazardous and/or toxic material for the protection of contractor and Air Force personnel shall be accomplished when necessary, especially during the drilling operation.

The presurvey report (mailed under separate cover) and Phase I IRP report (mailed under separate cover) incorporated background and description of the sites for this task. To accomplish the survey effort, the contractor shall take the following steps:

A. General

1. Determine the aerial extent of each site by reviewing available aerial photos of the base, both historical and the most recent panchromatic and infrared, and by field reconnaissance.

2. Locations where surface water, sediment, and core samples are collected shall be marked with a permanent marker, and the location recorded on a site map.

3. A total of 38 ground-water monitoring wells shall be installed. The exact location of the wells shall be determined in the field.

4. Columbia Aquifer Wells: Wells in the unconfined surficial aquifer shall be drilled using 6-inch hollow-stem augers or by rotary methods. Each ground-water monitoring well shall be constructed of 2-inch I.D. Schedule 40 PVC casing and screen. Ground-water monitoring wells shall be completed to the top of the Kirkwood confining layer, and the entire saturated interval shall be screened. The screened interval in each well shall consist of 0.010inch slotted PVC screen depending upon the geologic findings during the drilling operation. The annulus of the screened interval shall be gravel packed with #1 grade gravel or equivalent, as determined in the field as suitable for the soil formation. The gravel pack shall extend to 2 feet above the top of the screen. Heavy bentonite mud or pellets shall be placed above the gravel pack to form a seal of from 2- to 3-feet in thickness, and the seal shall be completed using a bentonite grout mixture to the surface. Each well shall be provided with a surface grout seal and protective steel casing with locking cap. All wells shall be developed until they produce

clear, sand-free water. Each well shall be clearly numbered with exterior paint and be provided with three guard posts placed radially away from each well.

5. Frederica Aquifer Wells: Wells in the Frederica Aquifer shall be drilled using hydraulic rotary methods. Each ground-water monitoring well shall be constructed of 4-inch I.D. Schedule 80 PVC casing and screen. A 10-inch diameter borehole shall be drilled from the surface, through the surficial aquifer, and extended to the top of the Kirkwood confining layer. An 8-inch steel casing shall be placed in the borehole, and bentonite grout shall be tremied down the casing until grout rises to the surface in the annular space between the 8-inch casing and the borehole. While circulating the bentonite-grout mixture in the 8-inch casing, the 8-inch casing shall be driven at least 3 feet into the Kirkwood confining layer. All grout and drilling mud shall be evacuated from inside the casing. After the bentonite grout mixture has set for at least 24 hours, a 6-inch diameter borehole shall be extended through the confining layer and into the upper 15 feet of the Frederica Aquifer. The 4-inch I.D. Schedule 80 PVC casing and screen shall be installed and 15 feet of screen shall be set. The screened interval in each well shall consist of 0.010 inch slotted PVC screen depending upon the geologic findings during the drilling operation. The annulus of the screened interval shall be gravel packed with #1 grade gravel or equivalent, as determined in the field as suitable for the soil formation. The gravel pack shall extend to 2 feet above the top of the screen. Heavy bentonite mud or pellets shall be placed above the gravel pack to form a seal of from 2- to 3-feet in thickness, and the seal shall be completed using a bentonite grout mixture to the surface. Each well shall be provided with a surface grout seal and protective steel casing with locking cap. All wells shall be developed until they produce clear, sand-free water. Each well shall be clearly numbered with exterior paint and be provided with three guard posts placed radially away from each well.

6. Well Point Installation: Each well point shall be constructed of 2-inch I.D. steel with 3-foot, 0.010 inch slotted stainless steel screen. A 6-inch augered borehole shall be drilled to 10-feet below the surface (BLS). The well point and casing shall be driven down the borehole to 15-20 feet BLS such that the screen is at least 5 feet below the water table surface. The annular space between the 6-inch borehole and well point casing shall be sealed with heavy bentonite mud or pellets, and the seal shall be completed using a bentonite grout mixture to the surface. The well casing shall extend to 2.5 feet above land surface (ALS) and be provided with a cap and lock. All well points shall be developed until they produce clear, and-free water. Each well point shall be clearly numbered with exterior paint and be provided with three guard posts placed radially away from each well point.

7. Ground-water monitoring wells shall comply with U.S. EPA publication 330/9-81-002 NEIC Manual for Groundwater/Subsurface Investigations at Hazardous Waste Sites, and State of Delaware requirements for monitoring well installation. All wells shall be developed, water levels measured, and locations surveyed and recorded on a site map. Only screw type joints shall be used. Glue fittings are not permitted.

8. All water samples shall be analyzed on site by the contractor for pH, temperature, and specific conductance. Sampling, maximum holding time,

and preservation of samples shall comply strictly with the following references: Standard Methods for the Examination of Water and Wastewater, 15th Ed. (1980), pp 35-42; ASTM, Section 11, Water and Environmental Technology; and Methods for Chemical Analysis of Waters and Wastes, EPA Manual 600/4-79-020, pp xiii to xix (1979). All water samples shall be analyzed using minimum detection levels, as specified in Attachment 1.

9. Field data collected for each site shall be plotted and mapped. The nature of contamination and the magnitude and potential for contaminant flow within each site to receiving streams and ground waters shall be determined or estimated. Upon completion of the sampling and analysis, the data shall be tabulated in the next R&D Status report, as specified in Item VI below.

10. The contractor shall split all water and soil samples. One set of samples shall be analyzed by the contractor and the other set of samples shall be forwarded for analysis through overnight delivery to:

USAF OEHL/SA
Bldg 140
Brooks AFB TX 78235

The samples sent to the USAF OEHL/SA shall be accompanied by the following information:

(a) Purpose of sample (analyte)

(b) Installation name (base)

(c) Sample number (on containers)

(d) Source/location of sample

(e) Contract Task Numbers and Title of Project

(f) Method of collection (bailer, suction pump, air-lift pump, etc.)

(g) Volumes removed before sample taken

(h) Special Conditions (use of surrogate standard, special nonstandard preservations, etc.)

(i) Preservatives used

This information shall be forwarded with each sample by properly completing an AF Form 2752 (copy of form and instructions on proper completion mailed under separate cover). In addition, copies of field logs documenting sample collection should accompany the samples. Chain-of-custody records for all samples, field blanks, and quality control duplicates shall be maintained. All contractor QA/QC program analysis results shall be included in the analytical results of draft final report (as specified in Item VI below).

B. In addition to items delineated in A above, conduct the following specific actions at sites identified on Dover AFB DE:

1. Site T-1. IW Basins

a. Install four ground-water monitoring wells in the Columbia Aquifer. One well shall be located 100 feet upgradient of the basins and three wells shall be placed directly downgradient of the basins. Wells shall be an average of 50 feet in depth; total footage drilled shall not exceed 200 feet.

b. Install three ground-water monitoring wells into the Frederica Aquifer. One well shall be located 100 feet upgradient of the basins and two wells shall be placed downgradient of the basins and under the known Columbia Aquifer plume. Wells shall be an average of 80 feet in depth; total footage drilled shall not exceed 240 feet.

c. Collect one groundwater sample from each of the seven new wells and the three existing wells at the IW basins.

d. Each ground-water sample shall be analyzed for Volatile Organic Compounds (VOC), Oil and Grease-Infrared Method (O&G/IR), cyanide, phenols, Total Organic Halogens (TOX), Total Organic Carbons (TOC), and selected metals as specified in Attachment 1.

e. Collect two surface water and two sediment samples from the basins.

f. Each surface water and sediment sample shall be analyzed for VOC, O&G/IR, cyanide, phenols, TOX, TOC, and selected metals as specified in Attachment 1.

2. Site DD-1. North Drainage Ditch

a. Three soil borings shall be drilled at this site to a depth of 5 feet BLS. Each soil boring shall be located adjacent to a surface water and sediment sample location. Soil samples shall be collected with a hand auger. Soil samples shall be retained for analysis at 2-3 feet BLS and 4-5 feet BLS. A maximum of 6 samples shall be analyzed.

b. Each soil sample shall be analyzed for O&G/IR, cyanide, phenols, TOX, TOC, and the selected metals specified in Attachment 1.

c. Collect 8 surface water and 8 sediment samples from the North Drainage Ditch, with exact locations of sampling points dependent upon influent points along the Ditch. Sediment samples shall be taken from between .5-1.5 feet below the top of the sediment layer.

d. Each surface water and sediment sample shall be analyzed for O&G/IR, cyanide, phenols, TOX, TOC, and the selected metals specified in Attachment 1.

3. Site D-10. Sanitary Landfill

a. Install one upgradient and four downgradient ground-water monitoring wells into the Columbia Aquifer. Wells shall be installed at locations adjacent to the site. Wells shall be an average of 50 feet in depth; total footage drilled shall not exceed 250 feet.

b. Collect one ground-water sample from each well.

c. Each ground-water sample shall be analyzed for O&G/IR, cyanide, phenols, TOX, TOC, and the selected metals specified in Attachment

4. Site D-4. Liquid Waste Disposal Site

a. Conduct additional reconnaissance activities to identify site boundaries. These activities shall consist of bringing DAFB personnel familiar with past disposal operations conducted at the site to the area to identify site location, taking soil samples with a hand auger to detect soil discoloration, odor, or waste material which will indicate past disposal operations, or conducting magnetometer surveys of the identified area in an effort to determine site location.

b. Install one upgradient and three downgradient ground-water monitoring wells into the Columbia Aquifer. Wells shall be installed at locations adjacent to the site. Wells shall be an average of 50 feet in depth; total footage drilled shall not exceed 200 feet.

c. Collect one ground-water sample from each well.

d. Each ground-water sample shall be analyzed for VOC, O&G/IR, cyanide, phenols, TOX, TOC, and the metals specified in Attachment 1.

5. Site FT-1. Fire Training Area 1

a. Conduct additional reconnaissance activities to identify site boundaries. These activities shall consist of bringing DAFB personnel familiar with past site operations to the area to identify site location, or contacting the engineering or construction organization responsible for golf course construction to review any available records which may indicate burn areas, area grading, or placement of fill material over site required to raise the land surface.

b. Install one upgradient and three downgradient ground-water monitoring wells into the Columbia Aquifer. Wells shall be installed at locations adjacent to the site. Wells shall be an average of 50 feet in depth; total footage drilled shall not exceed 200 feet.

c. Collect one ground-water sample from each well.

d. Each ground-water sample shall be analyzed for O&G/IR, TOX, TOC, and the selected metals specified in Attachment 1.

e. Collect one upstream surface water sample and one downstream surface water sample from the drainage ditch adjacent to the site.

f. Each surface water sample shall be analyzed for O&G/IR, TOX, TOC, and the selected metals specified in Attachment 1.

6. Site FT-3. Fire Training Area 3

a. Install one upgradient and two downgradient ground-water monitoring wells in the Columbia Aquifer. Wells shall be installed at locations in the immediate vicinity of the site. Wells shall be an average of 50 feet in depth; total footage drilled shall not exceed 150 feet.

b. Collect one ground-water sample from each well.

c. Each ground-water sample shall be analyzed for O&G/IR, TOX, TOC, and the selected metals specified in Attachment 1.

d. Collect four surface water and four sediment samples from the streams and wetland areas adjacent to the site.

e. Each surface water sample shall be analyzed for O&G/IR, TOX, TOC, and the selected metals specified in Attachment 1.

7. Site SP-4. JP-4 Pipeline Leak

a. Conduct additional reconnaissance activities to determine the exact location of the leak. This activity involves bringing DAFB personnel familiar with the JP-4 leak to the site to identify its location.

b. Install three well points at locations within the estimated spill area to a depth of at least 5 feet below the water table surface. Well points shall be installed to total depth of 15-20 feet BLS.

c. Collect one ground-water sample from each well point.

d. Each ground-water sample shall be analyzed for O&G/IR and TOC.

8. Site D-5. Sanitary Landfill

a. Conduct additional reconnaissance activities to identify site boundaries. These activities shall involve bringing DAFB personnel familiar with past disposal operations conducted at the site to the area to identify the exact site location and taking soil samples with a hand auger to confirm landfill location through soil discoloration, odor, or waste material.

b. Install three downgradient ground-water monitoring wells into the Columbia Aquifer. Wells shall be installed at locations adjacent to the site. The upgradient well installed for Site D-4, Liquid Waste Disposal Site, shall serve as a source of upgradient water quality samples for both Site D-4 and Site D-5. Wells shall be an average of 50 feet in depth; total footage drilled shall not exceed 150 feet.

c. Collect one ground-water sample from each well.

d. The ground-water sample shall be analyzed for VOC, [illegible] cyanide, phenols, TOX, TOC, and the metals specified in Attachment 1.

9. Site FT-2. Fire Training Area 2

a. Conduct additional reconnaissance activities to [illegible] the exact location of the site. The activity shall consist of interviews DAFB personnel familiar with past operations conducted on the site.

b. Install one wellpoint at the closest point suitable for drilling and downgradient from the site. Well point shall be driven to a depth of at least 3 feet below the water table surface and shall be installed to total depth of 15-20 feet BLS.

c. Collect one ground-water sample from the well point.

d. The ground-water sample shall be analyzed for O&G/IR, TOX and TOC.

10. Site S-1. Hazardous Waste Storage Yard

a. Install one upgradient and three downgradient ground water monitoring wells into the Columbia Aquifer. Wells shall be installed in locations adjacent to the site. Wells shall be an average of 50 feet in depth; total footage drilled shall not exceed 200 feet.

b. Collect one ground-water sample from each well.

c. Each ground-water sample shall be analyzed for VOC, O&G/IR, cyanide, phenols, TOX, TOC, the selected metals specified in Attachment 1 and PCB's.

d. Two soil borings shall be drilled at this site to a depth of 5 feet BLS. The borings shall be located in areas immediately adjacent to the Storage Yard. Soil samples shall be collected with a hand-auger. Soil samples shall be retained for analyses at 1-2 feet BLS and 4-5 feet BLS. A maximum of 4 samples shall be analyzed.

e. Each soil sample shall be analyzed for VOC, O&G/IR, cyanide, phenols, TOX, TOC, the selected metals specified in Attachment 1 and PCB's.

11. Site XYZ. Main Fuel Pumping Manholes

a. Install four well points around Building 950 to a depth at least 3 feet below the water table surface. Well points shall be installed to total depth of 15-20 feet BLS.

b. Collect one ground-water sample from each well point.

c. Each ground-water sample shall be analyzed for O&G/IR and TOC.

d. Collect three surface water and three sediment samples from manholes in this area.

e. Each surface water and sediment sample shall be analyzed for O&G/IR and TOC.

12. Site D-2. Sanitary Landfill

a. Four soil borings shall be drilled at this site to a depth of 5 feet BLS. The borings shall be located in areas adjacent to the site. Soil samples shall be collected with a hang-auger. Soil samples shall be retained for analysis at 4-5 feet BLS. A maximum of 4 samples shall be analyzed.

b. Each soil sample shall be analyzed for O&G/IR, TOX, TOC, and selected metals specified in Attachment 1.

c. Collect four surface water and four sediment samples from wet areas adjacent to the site.

d. Each surface water and sediment sample shall be analyzed for O&G/IR, TOX, TOC, and selected metals specified in Attachment 1.

C. Well Installation and Clean-up

The well and boring area shall be cleaned following the completion of each well and boring. Drill cuttings shall be removed and the general area clean. If hazardous waste is generated in the process of well installation, the contractor shall be responsible for proper containerization of drill cuttings for eventual government disposal. The contractor shall determine those drill cuttings suspected as being hazardous waste based upon discoloration, odor, or organic vapor detection instrument. The contractor shall test two samples of the suspected hazardous waste for EP Toxicity and Ignitability as specified in Attachment 1. Disposal of drill cuttings is not the responsibility of the contractor.

D. Results of all sampling and analysis shall be tabulated and incorporated in the Informal Technical Information report (Sequence 3, Atch 1 and Sequence 2, Atch 3 as specified in Item VI below) and forwarded to USAF OEHL/TS for review.

E. Reporting

1. A draft report delineating all findings of this field investigation shall be prepared and forwarded to the USAF OEHL, as specified in Item VI below, for Air Force review and comment. This report shall include a discussion of the regional site specific hydrogeology, well and boring logs, data from water level surveys, water quality and soil analysis results, available geohydrologic cross sections, groundwater and gradient vector maps, and laboratory quality assurance information. The report shall follow the USAF OEHL format (mailed under separate cover).

2. The recommendation section will address each site and list them by categories. Category I will consist of sites where no further action, including remedial action, is required. Data for these sites are considered sufficient to rule out unacceptable health or environmental risks. Category II sites are those requiring additional monitoring or work to quantify or further assess the extent of current or future contamination. Category III sites are sites that will require remedial actions (ready for IRP Phase IV actions). In each case the contractor will summarize or present the results of field data, environmental or regulatory criteria, or other pertinent information supporting these conclusions.

F. Cost Estimates

The contractor shall provide cost estimates for all additional work recommended to permit proper determination of contaminants. The recommendations provided shall include all efforts required to determine the magnitude and direction of movement of discovered contaminants along with an estimate of the time required to accomplish the proposed effort. This information shall be provided in a separately bound appendix to the final report.

G. Meetings

The contractor's project leader shall attend one meeting with Air Force officials and regulatory agency representatives to present and discuss results of this investigation. This meeting shall take place at Dover AFB DE for eight hours at a time to be specified by the USAF OEHL.

II. Site Location and Dates:

Dover AFB DE
Time and Dates
To be established

III. Base Support: None

IV. Government Furnished Property: None

V. Government Points of Contact:

1. 1Lt Maria R. LaMagna
USAF OEHL/TS
Brooks AFB TX 78235
(512) 536-2158
AV 240-2158

2. Capt Lindsey C. Waterhouse
USAF Hospital/SGPB
Dover AFB DE 19902
(302) 678-6605 Ext. 2598
AV 455-6605 Ext. 2598

3. Lt Col Edwin C. Banner III
HQ MAC/SGPB
Scott AFB IL 62225
(618) 256-2306
AV 638-2306

VI. In addition to sequence numbers 1, 5 and 10 which are applicable to all orders, the reference numbers below are applicable to this order. Also shown are data applicable to this order:

Sequence No.	Block 10	Block 11	Block 12	Block 13	Block 14
Atch 1					
4	ONE/R	85 MAR 30	85 MAY 15	85 SEP 15	*
3	O/TIME	**	**		2
Atch 5					
2	O/TIME	**	**		2

*Two draft reports will be required. After incorporating Air Force comments concerning the first draft report, the contractor shall supply the USAF OEHL with one copy of the second draft report. Upon USAF OEHL acceptance of the second draft report, the contractor shall distribute the remaining copies per a USAF OEHL prepared distribution list. The contractor shall supply the USAF OEHL with 20 copies of each draft report and 50 copies plus the original camera-ready copy of the final report.

**Upon completion

Attachment 1

Levels of Detection Required

Levels of Detection are for water unless shown otherwise:

Analyte	Analytical Method	Detection Limit	No. Samples
Oil and Grease (IR)	EPA 413.2	100 µg/L (waters); 100 µg/g (soil)	64 W; 35 S
Polychlorinated Biphenyls (PCB's)	EPA 608	0.25 µg/L (waters; 1 µg/g (soil)	4 W; 4 S
Phenols	EPA 420.1	1 µg/L (waters); 1 µg/g (soil)	36 W; 20 S
*Total Organic Carbon (TOC)	EPA 415.1	1000 µg/L	64 W; 35 S
*Total Organic Halogens (TOX)	EPA 9020	5 µg/L (waters); 5 µg/g (soil)	54 W; 32S
Volatile Organic Compounds (VOC)		**	23 W; 6 S
pH	EPA 150.1		64 W
Specific Conductance	EPA 120.1	1 µmho/cm	64 W
Arsenic (1)	EPA 206.2 or 206.3	10 µg/L	53 W; 32 S
Cadmium (1)	EPA 213.2	10 µg/L	53 W; 32 S
Chromium (1)	EPA 218.1	50 µg/L (waters); 5 µg/g (soil)	53 W; 32 S
Copper (2)	EPA 220.1	20 µg/L	53 W; 32 S
Cyanide	Standard 412	10 µg/L	36 W; 20 S
Iron (2)	EPA 236.1	100 µg/L	53 W; 32 S
Lead (1)	EPA 239.2	20 µg/L (waters); 2 µg/g (soil)	53 W; 32 S
Mercury (1)	EPA 245.1 and 245.5 (soils)	1 µg/L	53 W; 32 S
Nickel	EPA 249.1	100 µg/L	53 W; 32 S
Silver (1)	EPA 272.2	10 µg/L	53 W; 32 S
Zinc (2)	EPA 289.1	50 µg/L	53 W; 32 S
EP Toxicity	40 CFR 261.24	***	2
Ignitability	40 CFR 261.21	****	2

*Detection levels for TOX and TOC must be three times the noise level of the instrument. Laboratory distilled water must show no response. If so, correct of positive results must be made.

**Determine limits for Volatile Organic Compounds shall be as specified for the compounds by EPA Methods 601-603. Method: Federal Register, Vol. 44, No. 233, pp 69468-69473. This method should be strictly followed including these item:

Item 1.4 - This method is recommended by EPA for use only by experienced resi analysts or under the close supevision of such qualified persons.

Item 2.2 - This is most important. If interferences are encountered (as in earl peaks such as vinyl chloride), the method provides a secondary gas chromatographic column that will be helpful in resolving the compound of interest from interferences. This must be done in the case of vin chloride and so noted in analysis report.

Item 3.3 - 7.1-7.3 - These sections on interferences, contamination and QC shoul be strictly followed.

Item 8.3 - All samples must be analyzed within the recommended holding times. This must be followed without exception.

If questions are encountered about certain contaminants you may be asked to sho both chromatograms used to rule out possible interferences.

***

Metal	ug/L of Solution
As	10
Ba	200
Cd	10
Cr	50
Pb	20
Hg	1
Se	10
Ag	10

****Find if sample is ignitable at 140 degrees F or below. If so, it is a hazardo waste.

(1) = Primary Drinking Water Standard, 40 CFR 141.11.

(2) = Secondary Drinking Water Standard, 40 CFR 143.3.

APPENDIX C: Sample Locations and Identifications

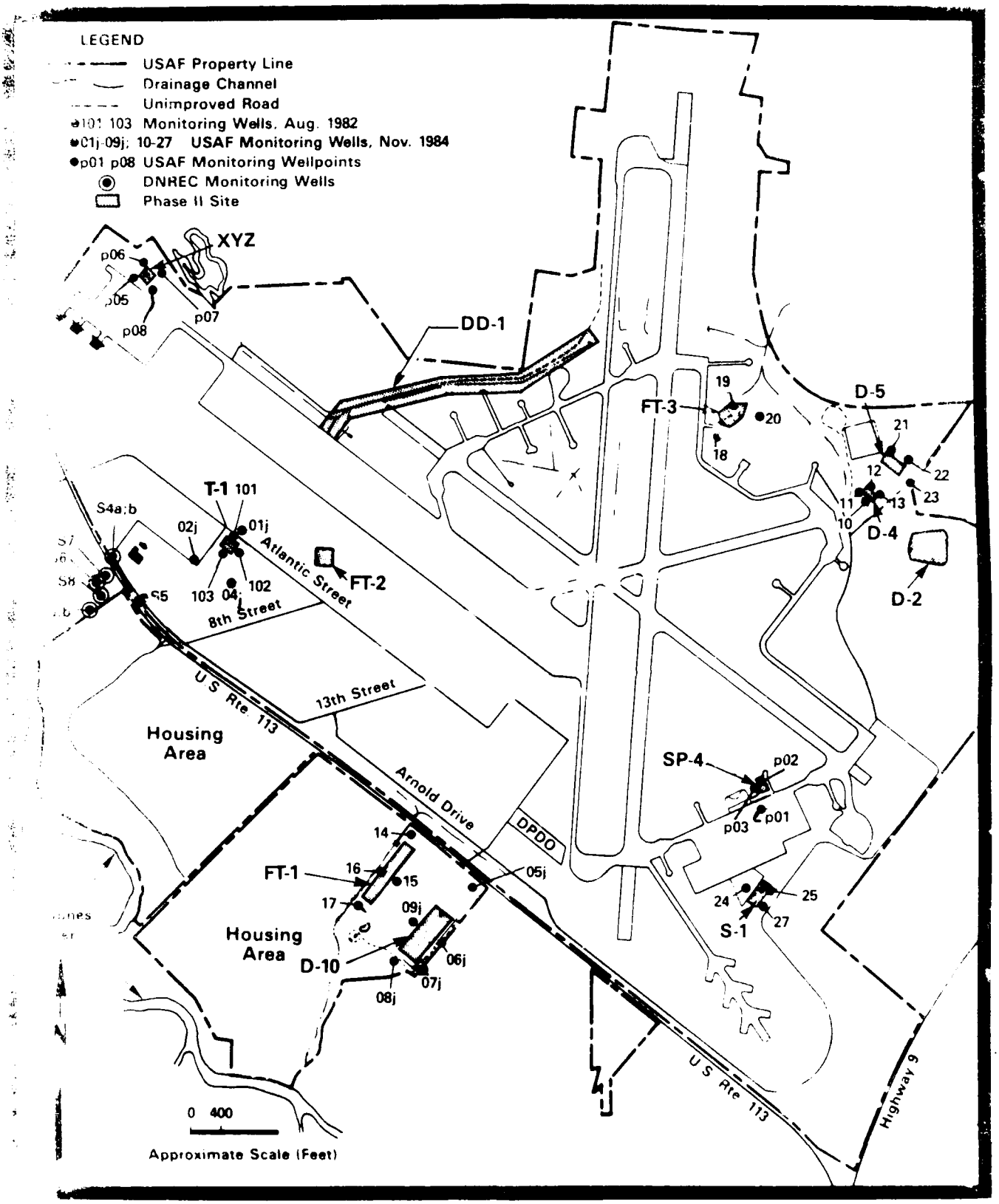


Figure C-1 Locations of Groundwater Monitoring Wells at Dover Air Force Base, December 1984

TABLE C-1

KEY TO SAIC/JRB SAMPLE NUMBER AND USAF SAMPLE NUMBERS
GROUNDWATER SAMPLES

JRB NO.	USAF SAMPLING SITE IDENTIFIER	USAF BASE SAMPLE NO.	DATE SAMPLED[1]
MW01j	0052-PG-001	GP-84-0479	12/6/84[1]
02j	0052-PG-002	GP-84-0480	12/6/84[1]
04j	0052-PG-004	GP-84-0481	12/6/84[1]
101	0052-PG-101	GP-84-0482	12/6/84[1]
102	0052-PG-102	GP-84-0483	12/6/84[1]
103	0052-PG-103	GP-84-0484	12/6/84[1]
05j	0052-PG-005	GP-84-0470	12/4/84
06j	0052-PG-006	GP-84-0471	12/4/84
07j	0052-PG-007	GP-84-0472	12/4/84
08j	0052-PG-008	GP-84-0473	12/4/84
09j	0052-PG-009	GP-84-0474	12/4/84
10	0052-PG-010	GP-84-0463	11/29/84[1]
11	0052-PG-011	GP-84-0464	11/29/84[1]
12	0052-PG-012	GP-84-0465	11/29/84[1]
13	0052-PG-013	GP-84-0466	11/30/84[1]
14	0052-PG-014	GP-84-0475	12/4/84
15	0052-PG-015	GP-84-0476	12/4/84
16	0052-PG-016	GP-84-0477	12/4/84
17	0052-PG-017	GP-84-0478	12/4/84
18	0052-PG-018	GP-84-0495	12/11/84
19	0052-PG-019	GP-84-0496	12/11/84
20	0052-PG-020	GP-84-0497	12/11/84
21	0052-PG-021	GP-84-0467	11/30/84[1]
22	0052-PG-022	GP-84-0468	11/30/84[1]
23	0052-PG-023	GP-84-0469	11/30/84[1]
24	0052-PG-024	GP-84-0498	12/11/84[1]
25	0052-PG-025	GP-84-0499	12/11/84[1]
27	0052-PG-027	GP-84-0500	12/11/84[1]
p01	0052-PG-901	GP-84-0501	12/11/84
p02	0052-PG-902	GP-84-0502	12/11/84
p03	0052-PG-903	GP-84-0503	12/11/84
p05	0052-PG-905	GP-84-0485	12/6/84
p06	0052-PG-906	GP-84-0486	12/6/84
p07	0052-PG-907	GP-84-0487	12/6/84
p08	0052-PG-908	GP-84-0488	12/6/84

[1] Samples for volatile organics analysis for these locations collected between 2/18 and 2/22/85

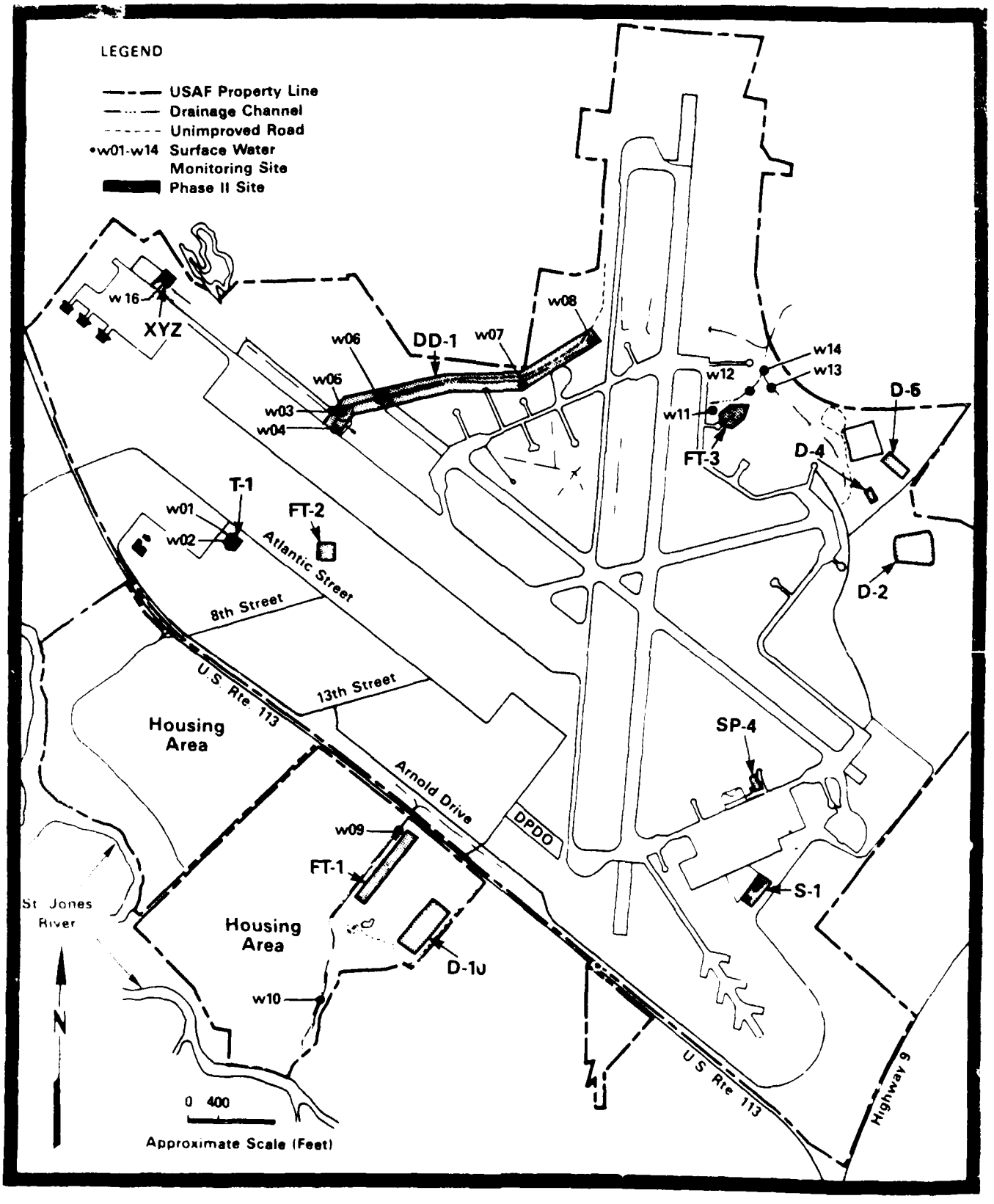


Figure C-2 Locations of Surface Water Monitoring at Dover Air Force Base, December 1984

TABLE C-2

KEY TO SAIC/JRB SAMPLE NUMBERS AND USAF SAMPLE NUMBER
SURFACE WATER SAMPLES

SAIC/ JRB NO.	USAF SAMPLING SITE IDENTIFIER	USAF BASE SAMPLE NO.	DATE SAMPLED
SW01	0052-NP-001	GN-84-0504	12/12/84[1]
02	0052-NP-002	GN-84-0505	12/12/84[1]
03	0052-NA-803	GN-84-0489	12/7/84
04	0052-NA-804	GN-84-0490	12/7/84
05	0052-NA-805	GN-84-0491	12/7/84
06	0052-NA-806	GN-84-0492	12/7/84
07	0052-NA-807	GN-84-0493	12/7/84
08	0052-NA-808	GN-84-0494	12/7/84
09	0052-NA-009	GN-84-0506	12/14/84
10	0052-NA-010	GN-84-0507	12/14/84
11	0052-NA-011	GN-84-0508	12/13/84
12	0052-NA-012	GN-84-0509	12/13/84
13	0052-NA-013	GN-84-0510	12/13/84
14	0052-NA-014	GN-84-0511	12/13/84
16	0052-NA-016	GN-84-0537	12/14/84

[1] Samples for volatile organics analysis for these locations collected between 2/18 and 2/22/85.

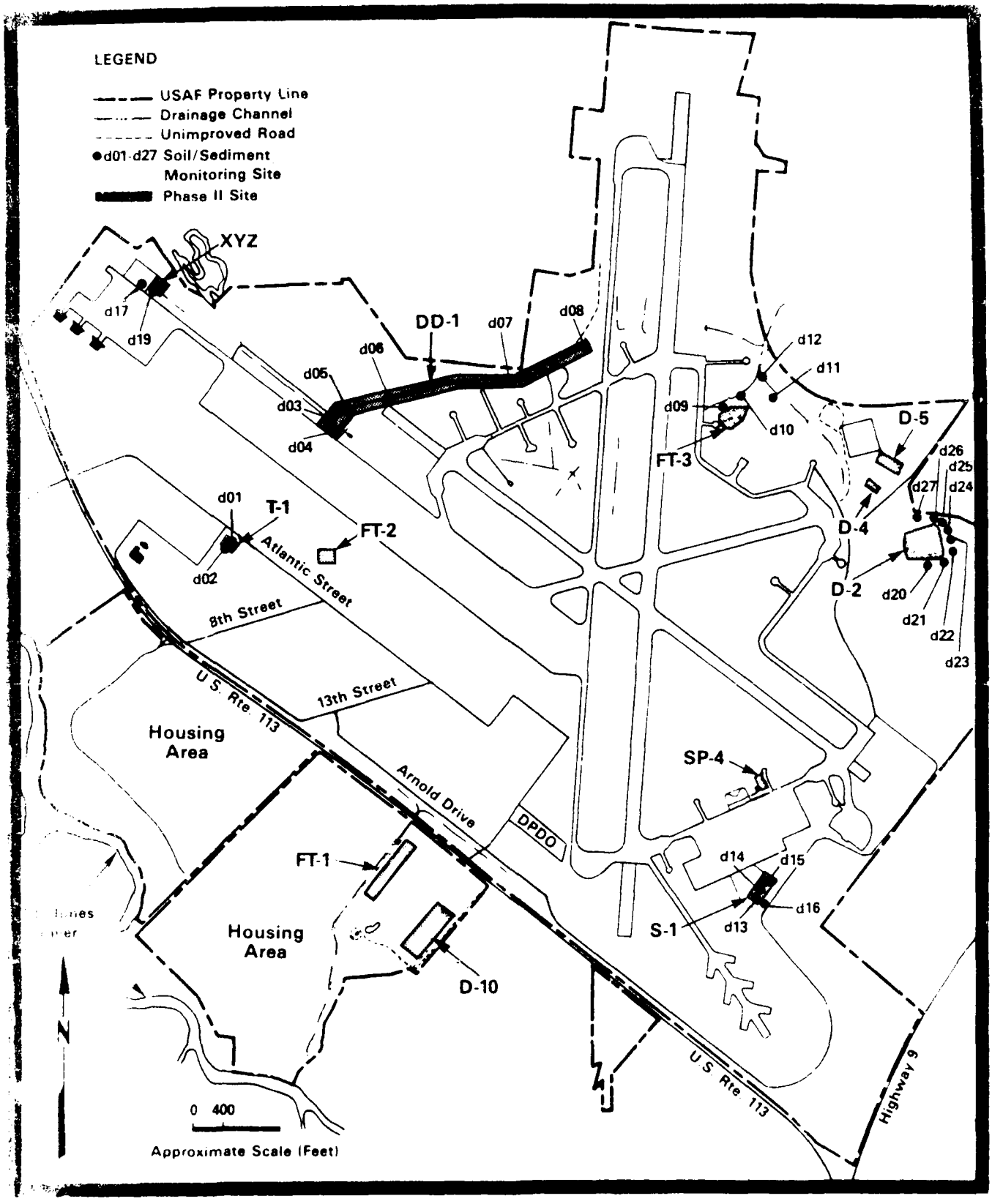


Figure C-3 Locations of Soil/Sediment Monitoring at Dover Air Force Base, December 1984

TABLE C-3

KEY TO SAIC/JRB SAMPLE NUMBERS AND USAF SAMPLE NUMBERS
SOIL AND SEDIMENT SAMPLES

JRB NO.	USAF SAMPLING SITE IDENTIFIER	USAF BASE SAMPLE NO.	DATE SAMPLED
SD/SL 01	0052-SO-001	GL-84-0516	12/12/84
02	0052-SO-002	GL-84-0517	12/12/84
03	0052-SO-003	GL-84-0523	12/13/84
04	0052-SO-004	GL-84-0522	12/13/84
05	0052-SO-005	GL-84-0515	12/13/84
06	0052-SO-006	GL-84-0514	12/13/84
07	0052-SO-007	GL-84-0513	12/13/84
08	0052-SO-008	GL-84-0512	12/13/84
09	0052-SO-009	GL-84-0518	12/12/84
10	0052-SO-010	GL-84-0519	12/12/84
11	0052-SO-011	GL-84-0520	12/12/84
12	0052-SO-012	GL-84-0521	12/12/84
13	0052-SO-013	SL-84-0524	12/13/84
14	0052-SO-014	SL-84-0525	12/13/84
15	0052-SO-015	SL-84-0526	12/13/84
16	0052-SO-016	SL-84-0527	12/13/84
17	0052-SO-017	GL-84-0540	12/14/84
19	0052-SO-019	GL-84-0541	12/14/84
20	0052-SO-020	GL-84-0528	12/14/84
21	0052-SO-021	GL-84-0529	12/14/84
22	0052-SO-022	GL-84-0530	12/14/84
23	0052-SO-023	GL-84-0531	12/14/84
24	0052-SO-024	GL-84-0532	12/14/84
25	0052-SO-025	GL-84-0533	12/14/84
26	0052-SO-026	GL-84-0534	12/14/84
27	0052-SO-027	GL-84-0535	12/14/84

APPENDIX D: Well Logs

TABLE D-1

SURVEYED WELL COORDINATES AND ELEVATIONS

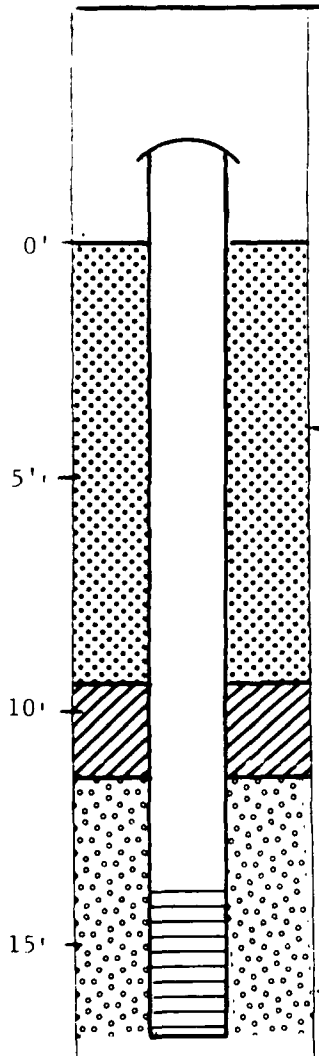
WELL NO.	COORDINATES(1) NORTH	COORDINATES(1) EAST	ELEVATION(2) TOP OF CASING	ELEVATION(2) LAND SURFACE
01j	411,263.4367	480,911.5413	21.39	19.44
02j	410,877.47792	480,260.69905	27.56	25.56
04j	410,681.95314	480,574.42018	25.40	23.20
05j	406,437.10226	484,152.66353	20.07	17.97
06j	405,605.89494	483,596.82766	17.40	15.35
07j	405,380.78541	483,396.98990	12.57	10.37
08j	405,582.8578	483,128.81236	14.20	12.50
09j	405,999.38374	483,448.94564	16.35	14.63
10	411,990.09969	489,274.84199	22.38	19.40
11	412,156.27189	489,330.03312	21.76	19.75
12	412,151.27359	489,423.92440	21.81	19.74
13	412,076.35991	489,441.33724	22.97	20.36
14	407,248.25277	483,347.51028	21.16	19.12
15	406,487.84036	483,018.25204	11.11	9.21
16	406,624.19895	482,807.17974	10.57	8.49
17	406,274.54671	482,630.46770	10.27	8.40
18	412,818.72363	487,417.78847	19.73	18.13
19	413,144.13525	487,643.98453	16.27	14.42
20	413,104.03656	487,854.71962	12.34	10.39
21	412,488.10025	489,590.92886	18.03	16.06
22	412,474.07947	489,879.96914	20.19	18.23
23	412,283.55836	489,935.34389	21.39	19.44
24	406,610.07279	487,952.89072	25.61	23.68
25	406,593.12117	488,217.56986	26.82	24.52
27	406,337.84156	488,016.30056	24.21	22.21
p01	407,837.86021	488,082.99658	28.02	25.92
p02	407,954.35868	488,123.87030	27.35	25.35
p03	407,815.61917	487,908.53666	26.99	25.79
p05	414,635.23693	479,552.02097	24.87	22.87
p06	414,692.70575	479,646.04471	28.87	26.87
p07	414,615.69372	479,826.02983	26.18	23.58
p08	414,372.82135	479,746.88764	26.84	24.84

(1) Delaware state grid system
(2) Feet mean sea level

JRB ASSOCIATES
A Company of Science Applications, Inc.
8400 Westpark Drive, McLean, Virginia 22102

WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MWP-01



Drilling Summary:

Total Depth: 17.0' Drillers: Gary Truver
Borehole Diameter's: 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 25.92' Bit's: Hollow Stem Auger
Top of Casing: 28.02' Drilling Fluid Type: None
Supervisory Geologist: R. Eades Amount Use:
Log Book No. 5 pp. 10-13, Water Level: 12.5' (11/6/84)

Well Design:

Casing: Material: Steel Screen: Material: Stainless Steel
Diameter: 2" ID 2⅜" OD Diameter: 2"
Length: 16.0' Slot: 0.01" 10 Slot/Inch
Filter: Material: 40 Sand Setting: 13.5-16.5'
Setting: 11.5-17.0' Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement Setting: 9.5-11.5'
Setting: LS-9.5' Surface Casing: Steel
Other:

Time Log:

	Started	Completed
Drilling:	11/6/84 0910 hr	11/6/84 1335 hr
Installation:	11/6/84 1350 hr	11/6/84 1420 hr
Water Level Reading:		11/6/84 1040 hr
Development:		

Well Development:

Method Equipment: Compressed air blown; bailed.

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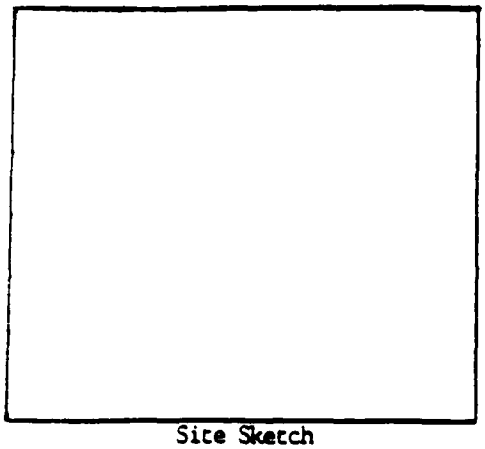
DRILLING LOG

Project: Dover AFB **Owner:** US Air Force **Well No.:** MWP-01



Site Sketch

Location: Site SP-4
Building 1310 Area

Reference Point: Land Surface

Reference Point Elevation: 25.92'

Field Book No.: 5 pp 10-13
Log By: Richard Eades
Driller: Gary Truver
Rig Type: CME Auger
Total Depth: 17.0'

	Date	Time
Drilling Started:	11/6/84	0910 hrs
Drilling Completed:	11/6/84	1335 hrs
Water Level:	11/6/84	1040 hrs

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION C=Cuttings
		C		0-2' BLS Dark grayish brown silt, some clay, trace sand; gravel layer at approximately 1.5' BLS.
		C		2-4' BLS Medium to light brown sand, some silt and gravel, trace clay.
		C		4-7' BLS Same as above.
		C		7-9.5' BLS Medium yellow to reddish brown silt, some sand.
				9.5-10' BLS Dark brown clay some silt.

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DRILLING LOG

MWP-01 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10'		C		10-13.5' BLS Dark brown to grayish brown clay and silt.
12'				
14'		C		13.5-17.0' BLS No cuttings returned.
16'				
18'				
20'				
22'				
24'				
26'				

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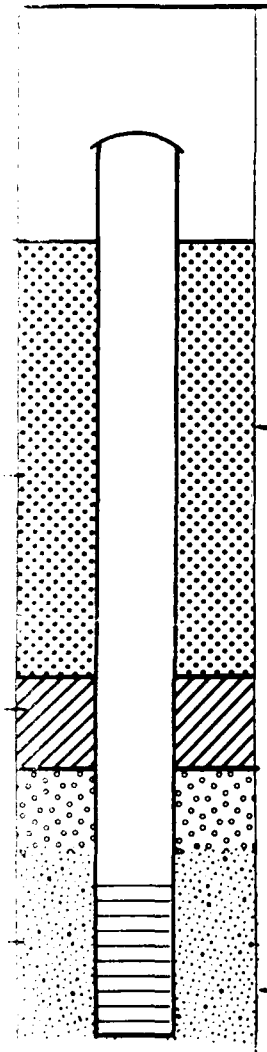
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: [illegible]



Drilling Summary:

Total Depth: 17.0' Drillers: Gary Truver
Borehole Diameter(s): 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 25.35' Bit(s): Hollow Stem Auger
Top of Casing: 27.35' Drilling Fluid Type: None
Supervisory Geologist: R. Eades Amount Use:
Log Book No. 5 pp. 14-15 Water Level: 12.5' BLS 11/6/84

Well Design:

Casing: Material: Steel Screen: Material: Stainless Steel
Diameter: 2" ID 2½" OD Diameter: 2"
Length: 16.0' Slot: 0.01" 10 Slot/Inch
Filter: Material: #Q Sand Setting: 13.5-16.5'
Setting: 11.3-13.0' Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement Setting: 9.3-11.3'
Setting: LS-9.4' Surface Casing: Steel
Other: Formation allowed to cave, providing natural sand pack from 13.0-17.0'

Time Log:

	Started	Completed
Drilling:	11/6/84 1052 hr	11/6/84 1448 hr
Installation:	11/6/84 1450 hr	11/6/84 1530 hr
Water Level Reading:		11/6/84 1106 hr
Development:		

Well Development:

Method/Equipment: Cmpressed Air Blown; Bailed.

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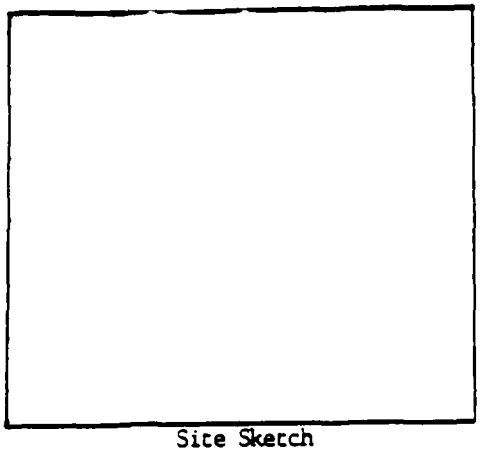
DRILLING LOG

Project: Dover AFB **Owner:** US Air Force **Well No.:** MW-02



Site Sketch

Location: Site SP-4
Building 1310 Area

Field Book No.: 5 pp 14-15
Log By: Richard Eades
Driller: Gary Truver
Rig Type: CME Auger

Reference Point: Land Surface
Total Depth: 17.0'

Reference Point Elevation: 25.35'

	Date	Time
Drilling Started:	11/6/84	1052 hrs
Drilling Completed:	11/6/84	1448 hrs
Water Level:	11/6/84	1106 hrs

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION (C=Cuttings)
0'		C		0-2.5' BLS Light brown fine sand, some silt, trace clay, trace gravel.
2'		C		2.5-4.0' BLS Dark brown to dark grayish brown sand, some silt.
4'		C		4.0-7.5' BLS Medium grayish brown silt, some clay.
6'				
8'		C		7.5-8.5' BLS Light gray sand.
10'		C		8.5-11.0' BLS Light grayish brown to medium brown silt and clay.

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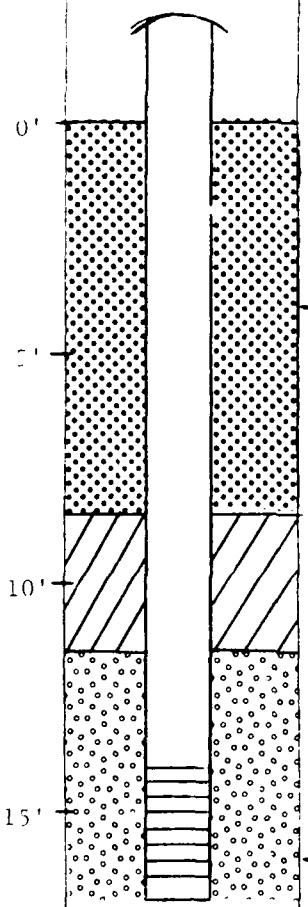
DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10'				
12'		C		11.5-12.5' BLS Gravel layer, moist at approximately 12.5' BLS.
				12.5-14' BLS No cutting returned.
14'		C		14.0-17.0' BLS Light to medium gray silt, some clay.
16'				
5'				
0'				
2'				
4'				
5'				

JRB ASSOCIATES
A Company of Science Applications, Inc.
8400 Westpark Drive, McLean, Virginia 22102

WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-[illegible]



Drilling Summary:

Total Depth: 17' BLS Drillers: Gary Truver (Walton)
Borehole Diameter: 6¼" Calvin Wallace (Delmarva)
Rig Type: CME-55/Failing 1250
Elevation: Land Surface: 25.79' Bits: Auger/Drag
Top of Casing: 26.99' Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Andris Lapins Amount Use:
Log Book No. 2 pp. 42-50 Water Level:

Well Design:

Casing: Material: Steel Screen: Material: Stainless Steel
Diameter: 2" ID 2¾" OD Diameter: 2"
Length: 16' Slot: .010", 10 Slot/Inch
Filter: Material: 4Q Sand Setting: 14-17' BLS
Setting: 11.5-17' BLS Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement Setting: 8.4-11.5' BLS
Setting: LS-8.4' BLS Surface Casing: Steel
Other:

Time Log:

	Started		Completed	
Drilling:	11/6/84	0910 hrs	11/6/84	1343 hrs
Installation:	11/6/84	1415 hrs	11/6/84	1500 hrs
Water Level Reading:				
Development:				

Well Development:

Method Equipment: [illegible]

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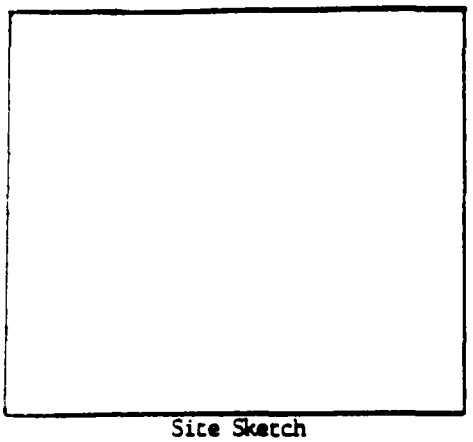
DRILLING LOG

Project: Dover AFB **Owner:** US Air Force **Well No.:** MWP-03



Site Sketch

Location: Site SP-4
Building 1310 Area

Field Book No.: 2 pp 42-45
Log By: Andris Lapins
Driller: Calvin Wallace (Delmar)
Rig Type: CME-55 Failing 1250

Reference Point: Land Surface
Total Depth: 17 BLS

Reference Point Elevation: 25.79'

	Date	Time
Drilling Started:	11/6/84	09[illegible]
Drilling Completed:	11/6/84	15[illegible]
Water Level:		

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0		Cuttings		0-3' BLS Dark brown silty fine sand, trace clay and gravel; heavy gravel layer at @ 0.5' BLS; moist.
				3-4' BLS Olive gray silty clay, trace fine sand; soft; moist.
				4-5' BLS Very dark gray to black silty fine sand; trace clay; moist.
				5-8' BLS Olive gray very fine sand, some silt, trace clay; moist.
				8-9' BLS Light gray silty clay, trace very fine sand; dark brown to yellow mottling; soft; moist.
				9-10' BLS Pale yellow silty clay, trace very fine sand; soft; moist.

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DRILLING LOG

MWP-03 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10'		CUTTINGS		10-12' BLS Dark olive gray silty clay; soft; moist.
12'				12-13.5' BLS Dark gray silty clayey medium to coarse sand; wet to saturated. Small gravel seam at @ 13' BLS.
				Water table estimated at @ 12' BLS.
14'				
16'				
18'				
20'				
22'				
24'				
26'				

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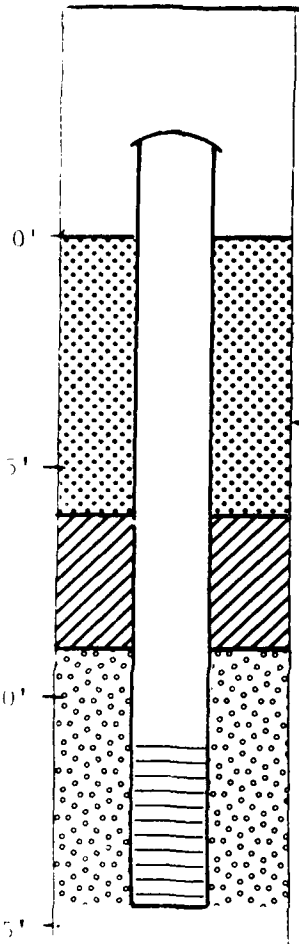
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: [illegible]



Drilling Summary:

Total Depth: 15.0' Drillers: Gary Truver
Borehole Diameter(s): 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 22.87' Bit(s): Hollow Stem Auger
Top of Casing: 24.87' Drilling Fluid Type: None
Supervisory Geologist: R. Eades Amount Use:
Log Book No. 5 pp. 25-27 Water Level: 7.6' BLS 11/7/84

Well Design:

Casing: Material: Steel Screen: Material: Stainless Steel
Diameter: 2" ID 2½" OD Diameter: 2"
Length: 19.5' Slot: 0.01" 10 Slot/Inch
Filter: Material: #1 Well Gravel Setting: 11.5-14.5'
Setting: 9.0-14.5' Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement Setting: 6.0-9.0'
Setting: LS-6.0' Surface Casing: Steel
Other:

Time Log:

	Started	Completed
Drilling:	11/07/04 1214 hr	11/07/84 1230 hr
Installation:	11/07/84 1232 hr	11/07/84 1300 hr
Water Level Reading:		11/07/84 1310 hr
Development:		

Well Development:

Method/Equipment: Compressed Air Blown; Bailed.

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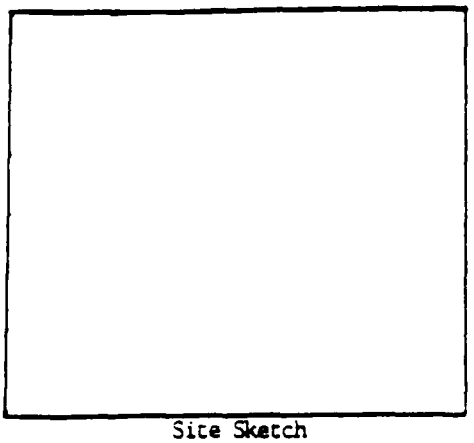
DRILLING LOG

Project: Dover AFB **Owner:** US Air Force **Well No.:** MW-05



Site Sketch

Location: Main Fuel Pump Station
Field Book No.: 5 pp 25-27
Log By: Richard Eades
Driller: Gary Truver
Rig Type: CME Auger
Reference Point: Land Surface
Total Depth: 15.0'
Reference Point Elevation: 22.87'

	Date	Time
Drilling Started:	11/7/84	1214 hr
Drilling Completed:	11/7/84	1230 hr
Water Level: 7.6' BLS	11/7/84	1310 hr

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION (C= Cuttings)
0'		C		0-3' BLS Medium brown fine sand, some silt, some gravel, trace clay.
2'				
4'		C		4-7' BLS Dark brownish to dark gray fine sand, some silt; gravel layer at approximately 6.5' BLS.
6'		C		7-12' BLS Medium gray sand, some silt, trace clay.
8'				
10'				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10'				
12'		C		12.0-12.5' BLS Gravel layer.
		C		12.5-15.0' BLS Dark gray sand, some silt, trace clay.
14'				
16'				
18'				
20'				
22'				
24'				
26'				

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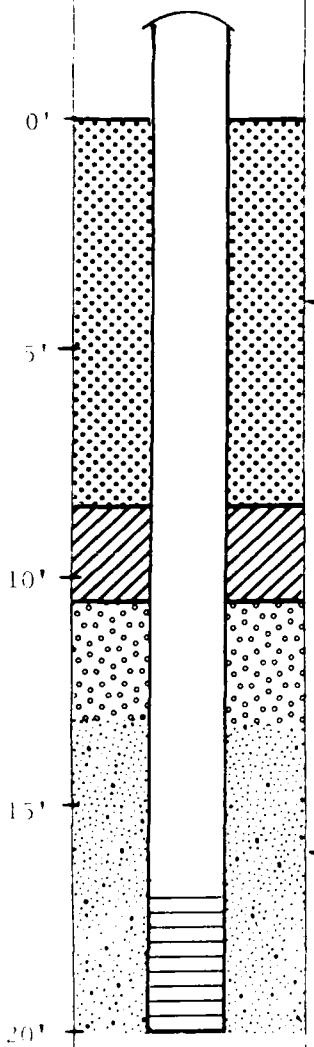
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-06



Drilling Summary:

Total Depth: 20.5' Drillers: Gary Trower
Borehole Diameter's: 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 26.87' Bit's: Hollow Stem Auger
Top of Casing: 28.87' Drilling Fluid Type: None
Supervisory Geologist: R. Eades Amount Use:
Log Book No. 5 pp. 22-24 Water Level: 12.0' BLS 11/7/84

Well Design:

Casing: Material: Steel Screen: Material: Stainless Steel
Diameter: 2" ID 2¼" OD Diameter: 2"
Length: 14.0' Slot: 0.01" 10 Slot/inch
Filter: Material: 40 Sand Setting: 17.0-20.0'
Setting: 10.5-13.0' Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement Setting: 8.5-10.5'
Setting: LS-8.5' Surface Casing: Steel
Other: Formation allowed to cave from 13.0-20.5' BLS

Time Log:

	Started	Completed
Drilling:	11/7/84 1011 hr	11/7/84 1100 hr
Installation:	11/7/84 1112 hr	11/7/84 1150 hr
Water Level Reading:		11/7/84 1310 hr
Development:		

Well Development:

Method Equipment: Compressed Air Blowing Bailing

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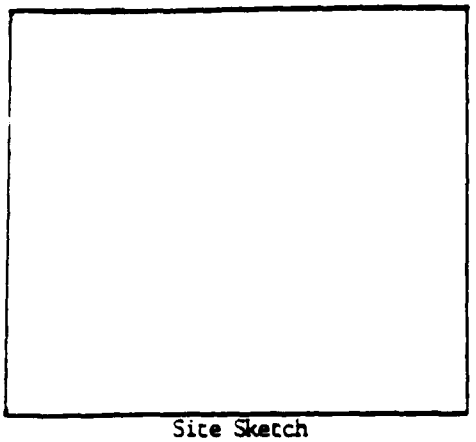
DRILLING LOG

Project: Dover AFB **Owner:** US Air Force **Well No.:** MW-06



Site Sketch

Location: Main Fuel Pump Station Bldg. 950

Reference Point: Land Surface

Reference Point Elevation: 26.87'

Field Book No.: 5 pp 22-24

Log By: Richard Eades

Driller: Gary Trover

Rig Type: CME Auger

Total Depth: 20.5'

	Date	Time
Drilling Started:	11/7/84	1011 hr
Drilling Completed:	11/7/84	1100 hr
Water Level:	11/7/84	1310 hr

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	C=Cuttings **DESCRIPTION**
0'		C		0-3' BLS Medium yellowish brown fine sand, some silt, trace clay.
2'		C		3-9' BLS Light brown grading downward to light grayish brown, fine sand, some silt.
4'				
6'				
8'				
10'		C		9-14' BLS Medium to light yellow brown, fine to medium sand, trace silt; moist at approximately 13.0' BLS.

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DRILLING LOG

MP-106 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10'				
12'				
14'		C		14-19' BLS Light brown coarse to medium sand, some fine sand; very wet at 16.5' BLS.
16'				
18'				
20'				19-20.5' BLS No cuttings returned.
22'				
24'				
26'				

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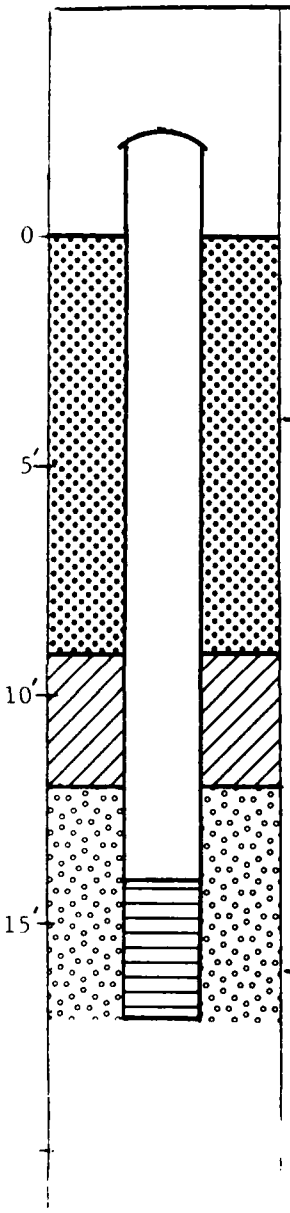
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-



Drilling Summary:

Total Depth: 17' BLS
Drillers: Calvin Walace
Delmarva Drilling
Borehole Diameter(s): 6½"
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 23.61'
Bit(s): Drag
Top of Casing: 26.18'
Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Andris Lapins
Amount Use: @ 50 gals.
Log Book No. 2 pp. 50-55
Water Level: 7.15' BLS 11/14/84

Well Design:

Casing: Material: Steel
Screen: Material: Stainless Steel
Diameter: 2" ID 2 1/4" OD
Diameter: 2"
Length: 16'
Slot: 0.010; 10/inch
Filter: Material: 4Q Sand
Setting: 14-17' BLS
Setting: 12-17' BLS
Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben
Setting: 8.9-12' BLS
Setting: LS-8.9' BLS
Surface Casing: Steel
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	11/7/84	0857 hrs	11/7/84	0910 hrs
Installation:	11/7/84	0920 hrs	11/7/84	1010 hrs
Water Level Reading:			7.15' BLS	11/14/84
Development :				

Well Development:

Method/Equipment: Compressed Air Blown; Bailed.

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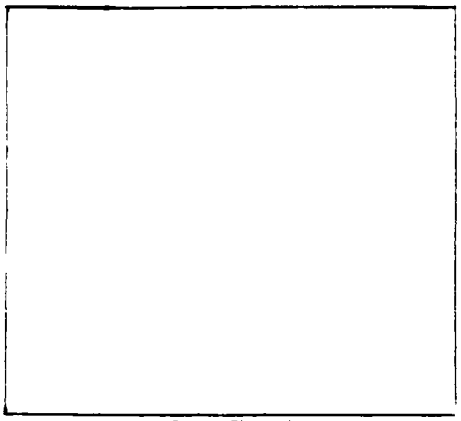
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-07



Site Sketch

Location: XYZ- Fuel Storage Area

Reference Point: Land Surface

Reference Point Elevation: 23.61'

Field Book No.: 2 pp 50-55

Log By: Andris Lapins

Driller: Calvin Wallace (Delmarva)

Rig Type: Failing 1250 Hydraulic Rotary

Total Depth: 17' BLS

	Date	Time
Drilling Started:	11/7/84	0830hrs
Drilling Completed:	11/7/84	0910
Water Level: 7.15' BLS	11/14/84	

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				Legend SI: Sampling Interval RE: Recovery SS: Split Spoon C: Cuttings Gradation Trace 1-12% Little 12-20% Some 20-30% And "Y" 30%
5		C		Pale yellow fine to medium sand, some silt.
				Faint hydrocarbon odor emminating from borehole at @ 6' bLS.
10				

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DRILLING LOG

MP-07 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		C		Light gray medium to coarse sand, trace silt;
				trace gravel.
		C		Olive gray medium sand, trace silt and gravel;
15				trace pieces of sea shells. Strong hydrocarbon
				odor; @ 8ppm on OVA.
		C		Pale yellow medium to coarse sands, trace silt
				and gravel.
0				
5				

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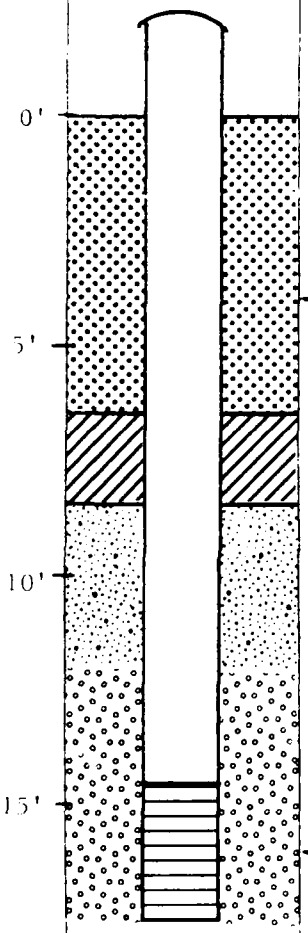
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-18



Drilling Summary:

Total Depth: 18.0' Drillers: Gary Trover
Borehole Diameter: 8" Wilton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 24.84' Bits: Hollow Stem Auger
Top of Casing: 26.84' Drilling Fluid Type: None
Supervisory Geologist: R. Eades Amount Use:
Log Book No. 5 pp. 19-21 Water Level: 9.2' 11/7/84

Well Design:

Casing: Material: Steel Screen: Material: Stainless Steel
Diameter: 2" ID 2⅜" OD Diameter: 2"
Length: 17.0' Slot: 0.01 10 Slot/Inch
Filter: Material: 40 Sand Setting: 14.5-17.5'
Setting: 12.0-18.0' Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement Setting: 6.5-8.5'
Setting: LS-6.5' Surface Casing: Steel
Other: Formation caved above sand pack from 8.5-12.0'

Time Log:

	Started	Completed
Drilling:	11/7/84 0835 hr	11/7/84 0855 hr
Installation:	11/7/84 0920 hr	11/7/84 0955 hr
Water Level Reading:		11/7/84 1305 hr
Development:		

Well Development:

Method Equipment: Compressed Air Blow, Bail

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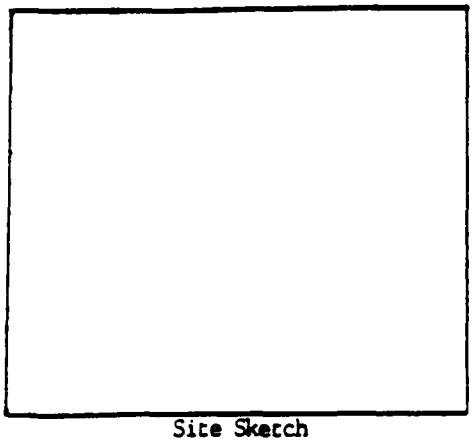
DRILLING LOG

Project: Dover AFB **Owner:** US Air Force **Well No.:** MW-08



Site Sketch

Location: Main Fuel Pump Station
Field Book No.: 5 pp 19-21
Log By: Richard Eades
Driller: Gary Trusler
Rig Type: CME Auger
Reference Point: Land Surface
Total Depth: 18.0'
Reference Point Elevation: 24.28'

	Date	Time
Drilling Started:	11/7/84	0835 hr
Drilling Completed:	11/7/84	0855 hr
Water Level:	11/7/84	1305 hr

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION (C=Cuttings)
0'		C		0-4' BLS Medium brown grading downward to dark brown silt, some sand, some clay.
2'				
4'		C		4-8' BLS Medium gray brown sand, some silt, moist at 6.5' BLS.
6'				
8'		C		8-8.5' BLS Gravel layer.
		C		8.5-11' BLS Light blueish gray sand, some silt.
10'				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10'				
		C		11.0-11.3' BLS Gravel layer.
12'				11.3-14' BLS Medium brown fine sand, some silt, trace clay; hit wet zone at approximately 12' BLS.
		C		14-18' BLS Medium brown fine to medium sand, some silt, trace clay.
14'				
16'				
18'				
20'				
22'				
24'				
26'				

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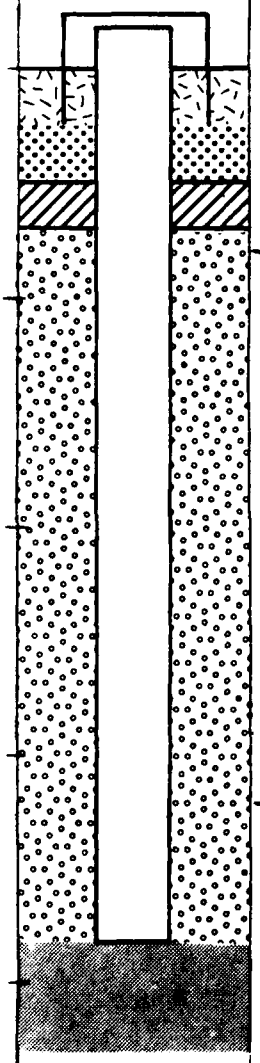
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: [illegible]



Drilling Summary:

Total Depth: 38' Drillers: Calvin Wallace
Borehole Diameter(s): 6" Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 19.44' Bit(s): Drag
Top of Casing: 21.39' Drilling Fluid Type: Water
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 4 pp. 93-105 Water Level: 10.9' 11/14/84

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2" ID 2 3/8"OD Diameter: 2"
Length: 11' Slot: 0.010; 5/inch
Filter: Material: 4Q Sand Setting: 9'-38'
Setting: 7'-38' Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 5'-7'
Setting: LS-5.0' Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	10/31/84	1020 hrs	10/31/84	1200 hrs
Installation:	10/31/84	1300 hrs	10/31/84	1500 hrs
Water Level Reading:			11/14/84	1510 hrs
Development:				

Well Development:

Method/Equipment: Air Blown Minimum 4 hours, pumped at 10 gpm minimum 4 hours and until clear.

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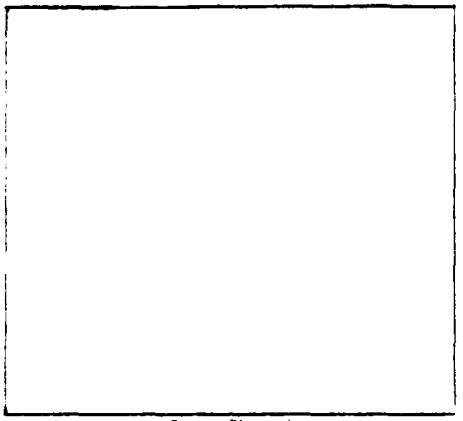
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-011



Site Sketch

Location: Industrial Waste Basins
Field Book No.: 4 pp93-105
Log By: Rick Eades
Driller: Calvin Wallace
Rig Type: Failing 1205 Hydraulic Rotary
Reference Point: Land Surface
Total Depth: 38'
Reference Point Elevation: 19.44'

	Date	Time
Drilling Started:	10/31/84	1020hr
Drilling Completed:	10/31/84	1200
Water Level: 10.9'	11/14/84	1510

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" 30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Gray silt, very dense, well compacted.
		C		Light brown fine sand, trace clay.
5		SS#1		SI: 5-7' BLS RE: 1.2'
			6	1.2' - Light gray (5YR 7/1) fine to medium sand,
			13	some silt, some clay, trace pebbles, thin
			20	orange laminations near bottom of sample.
			30	
10				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	7	SI: 10-12' BLS RE: 1.2'
			8	1.3' - Light gray (5YR 7/1) coarse to medium sand,
			10	some fine sand, trace silt, trace clay, trace
			13	pebbles.
		C		Brown, coarse sand and pebbles, some medium sand, trace f
		SS#3		SI: 15-17' BLS RE: 1.1'
15			8	1.1' - Dark orange brown (10YR 5/6) fine to medium
			15	sand, some silt, trace clay, trace pebbles.
			16	
			20	
		SS#4		SI: 20-22' BLS RE: 1.1'
			11	1.1' - Dark orange brown (10YR 5/6) medium sand,
			14	some fine sand, trace clay, trace pebbles.
			10	
			15	
		C		Medium to light brown, coarse to medium sand, trace f
				sand, some pebbles.

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DRILLING LOG

MW-01j

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	13	SI: 25-27' BLS RE: 1.1'
			14	1.1' - Medium orange brown (10YR 6/8) fine to medium
			8	sand, some silt, trace clay, thin black laminations
			13	in interval.
		C		Brown, coarse to medium sand, trace silt.
		SS#6		SI: 30-32' BLS RE: 1.7'
30			11	1.7' - Medium to dark orange brown (10YR 5/6) with thin
			17	black laminations, medium sand, some coarse sand,
			23	trace silt, trace clay.
			26	
		C		Light brown medium to fine sand, some silt, trace clay.
		SS#7		SI: 35-37' BLS RE: 1.3'
35			28	1.3' - Medium to dark reddish brown (10YR 5/6) coarse to
			24	medium sand, some fine sand, some pebbles, trace
			23	silt.
			24	
		C		Reddish brown, coarse to medium sand.
		C		Reddish brown sand with some dark gray clay.
				Driller indicated that top of the clay layer was contacted at
				approximately 38' BLS.
40				

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DRILLING LOG

NW-01j

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8		SI: 40-42' BLS RE: 2.0'
				2.0' - Dark gray (5Y 4/1) clay, silty, dense, finely laminated.
45				
50				
55				

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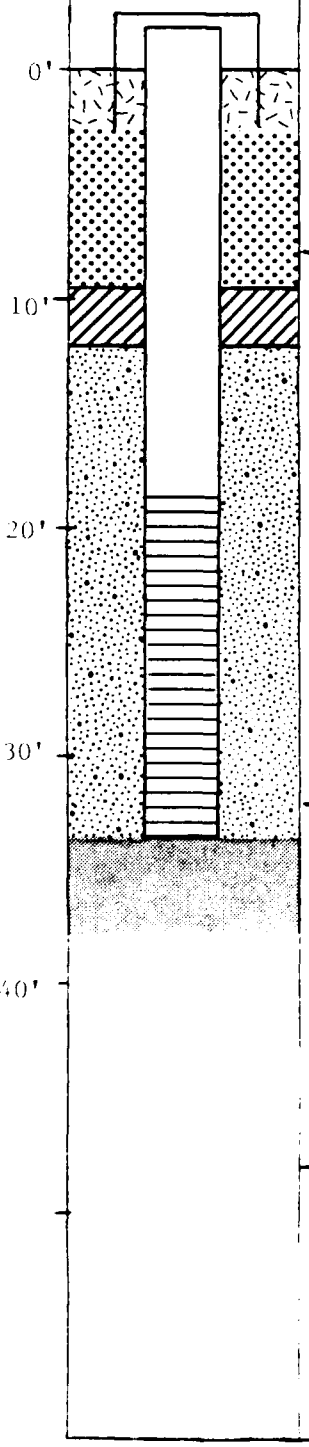
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: [illegible]-024



Drilling Summary:

Total Depth: 33.5' Drillers: Gary Truver
Borehole Diameter's : 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 25.56' Bit's : Hollow Stem auger
Top of Casing: 27.56' Drilling Fluid Type: None
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 5 pp. 61-67 Water Level: 18' 11/14/84

Well Design:

Casing: Material: Schedule 40 PVC Screen: Material: Schedule 40 PVC
Diameter: 2" ID 2 3/8"OD Diameter: 2"
Length: 10' Slot: 0.010; 5 slots/inch
Filter: Material: None Setting: 18-33.5'
Setting: Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 9.5'-11.5'
Setting: LS-9.5' Surface Casing: Steel/PVC
Other: Formation caved into 11.5' providing natural sand pack from 11.5' - 33.5'. Protective steel casing cemented into land surface.

Time Log:

	Started		Completed	
Drilling:	11/14/84	0900 hrs	11/14/84	1030 hrs
Installation:	11/14/84	1030 hrs	11/14/84	1139 hrs
Water Level Reading:			11/14/84	1030 hrs
Development :				

Well Development:

Method, Equipment: Air Blown for 8 hours, halted because of low recovery.

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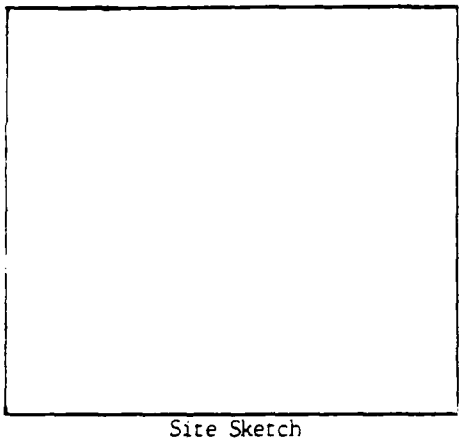
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-02J



Site Sketch

Location: Industrial
Waste Basins
Site T-1

Reference Point: Land Surface

Reference Point Elevation:

Field Book No.: 5 pp 61-67

Log By: Rick Eades

Driller: Gary Truver

Rig Type: CME Auger

Total Depth: 33.5'

	Date	Time
Drilling Started:	11/14/84	0900
Drilling Completed:	11/14/84	1[illegible]
Water Level: 18'	11/14/84	1[illegible]

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				Legend: SI: Sampling Interval; RE: Recovery; SS: Split Spoon; C: Cuttings. Gradation: Trace 1-12%; Little 12-20%; Some 20-30%; Add "Y" 30%
0				
		C		Medium to light brown, silt, some clay, trace sand, trace
				pebbles.
		SS#1		SI: 4-6' BLS RE: 1.5'
			4	0.7' - Brown (10YR 5/6) clay, some silt.
5			3	0.4' - Yellowish brown (10YR 6/6) sand, some silt, trace clay.
			3	0.4' - Yellowish brown (10YR 6/8) clay, trace silt.
			4	
		C		Silt, some clay, some sand.
		SS#2		SI: 9-11' BLS RE: 2.0'
			5	0.6' - Yellowish brown (10YR 6/8) clay, some silt.
10			10	1.4' - Clay, trace silt grading downward in color from

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DRILLING LOG

TB-02J cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	12	light gray (5YR 7/1) to brown (10YR 5/6).
			15	
		C		Clay, trace silt, brown to grayish brown.
		SS#3		SI: 14-16' BLS RE: 2.0'
			3	0.2' - Brown (10YR 5/6) sand, some clay.
			6	1.8' - Clay, color variable from gray (5YR 7/1) to
15			9	yellowish brown (10YR 6/8) with black streaks.
			11	
		C		Hit gravel layer, approximately 0.5' thick.
		C		Sand, some clay, wet.
		SS#4		SI: 19-21' BLS RE: 2.0'
			1	2.0' - Light yellowish brown (10YR 7/8) fine sand,
			1	some silt, trace clay, wet.
20			2	
			3	
		C		Gravel, approximately 0.5' thick.
		C		Gravel, approximately 0.5' thick.
		SS#5		SI: 24-26' BLS RE: 1.5'
			5	1.5' - Medium to dark yellowish brown (10YR 5/8)
25			6	coarse to medium sand, some pebbles, trace

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	5	fine sand.
			7	
		SS#6		SI: 29-31' BLS RE: 1.3'
			6	1.3' - Dark yellowish brown (7.5YR 5/8) coarse to
			6	medium sand, trace fine sand, trace pebbles.
30			7	
			11	
				Driller indicated top of clay layer contacted at 33' BLS.
		SS#7		SI: 34-36' BLS RE: 2.0'
			3	2.0' - Medium to dark gray (5Y 4/1) clay,
			3	silty, dense, finely laminated.
35			4	
			4	
		SS#8		SI: 37.5-38.5' BLS RE: 1.0'
			2	1.0' - Dark gray (5Y 4/1) silty clay.
			3	
40				

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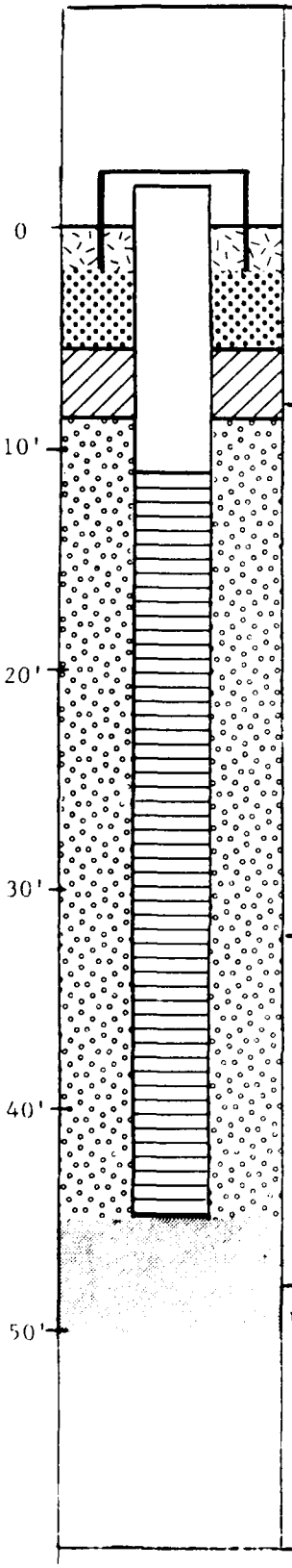
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-04J



Drilling Summary:

Total Depth: 44.8' BLS
Drillers: Calvin Wallace
Borehole Diameter(s): 6½"
Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 23.2'
Bit(s): Drag
Top of Casing: 25.4'
Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 3 pp. 16-28
Water Level: 12.76' BLS 1/9/85

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2" ID 2 1/4"OD
Diameter: 2"
Length: 13'
Slot: 0.010; 5/inch
Filter: Material: 4Q sand
Setting: 10.8 - 44.8' BLS
Setting: 8.8-44.8' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement/Ben
Setting: 5.25-8.8' BLS
Setting: 3-5.25' BLS
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started	Completed
Drilling:	11/9/84 0845 hrs.	11/9/84 1250 hrs.
Installation:	11/9/84 1300 hrs.	11/9/84 1442 hrs.
Water Level Reading:		1/9/85 12.76' BLS
Development :		

Well Development:

Method/Equipment: Air [illegible]
[illegible]
until clear.

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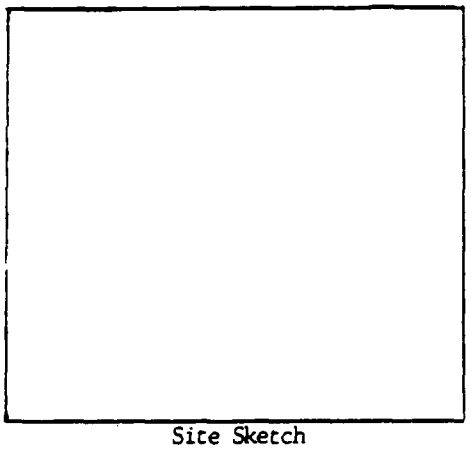
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-[illegible]



Site Sketch

Location: IW Basins, Site T-1

Field Book No.: 3 pp 16-2[illegible]

Log By: Andris Lapins

Driller: Calvin Wallace (Delm[illegible]

Rig Type: Failing 1250 Hydra[illegible] Rotary

Reference Point: Land Surface

Total Depth: 44.8' BLS

Reference Point Elevation: 23.2'

	Date	Time
Drilling Started:	11/9/84	084[illegible]
Drilling Completed:	11/9/84	12[illegible]
Water Level:	12.76' BLS	1/9/8[illegible]

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Heavy gravel (crushed stone) from large crushed stone pile located @ 15' away.
		C		Grayish brown medium sand, some silt and gravel.
5		SS#1		SI: 5-7' BLS RE: 1.1'
			12	1.1' - Light gray to white (5Y 8/2 - 7/2) clayey very fine
			21	sand, some silt; dense; firm, dry; brown to yellow
			22	mottling at top.
			35	
10				

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DRILLING LOG

MW-04J cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	14	SI: 10-12' BLS RE: 1.5'
			11	0.4' - Brownish yellow (10YR 6/6) coarse sand, some silt,
			14	trace light gravel; poorly sorted; moist.
			20	1.1' - White (5Y 8/2) silty very fine sand, trace clay and
				light gravel; loose; wet.
		SS#3		SI: 15-17' BLS RE: 1.15'
15			13	0.75' - White (2.5Y 8/2) medium to coarse sand, trace clay
			15	and light gravel; poorly sorted; firm; wet.
			40	0.4' - Yellow (2.5Y 8/6) fine to coarse sand, some silt,
			44	trace clay and light gravel; wet.
		SS#4		SI: 20-22' BLS RE: 1.1'
20			5	1.1' - Brownish yellow (10YR 6/8) fine to medium sand,
			7	some silt, trace clay and light gravel; light gravel
			8	laminations every several inches; loose; wet.
			10	
25				

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DRILLING LOG

MW - [illegible] cont.

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	13	SI: 25-27' BLS RE: 0.8'
			43	0.35' - Pale yellow (2.5Y 8/4) fine to medium sand some
			18	silt, trace light gravel; poorly sorted; loose; wet.
			43	0.45' - Strong brown (7.5YR 5/8) fine to medium sand, some
				silt, trace light gravel; few rounded quartz pebbles
				at bottom; poorly sorted; wet.
		SS#6		SI: 30-32 BLS' RE: None
30			11 12	Two attempts for sample yielded no recovery. Much
			12 22	heavy gravel accumulated in bottom of bore hole. Drilling
			14 23	mud thickened and hole flushed to bring up gravel.
			20 25	
		SS#7		SI: 35-37' BLS RE: 0.7'
35			21	0.7' - Strong brown (7.5YR 5/8) fine sand, some silt; wet.
			18	
			21	
			26	
40				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	22	SI: 40-42' BLS RE: 0.4'
			20	0.4' - Same as above
			26	
			36	
		SS#9		SI: 45-47' BLS RE: 1.3'
45			17	0.5' - Same as above
			17	0.8' - Yellowish red (5YR 5/8) silty clay, trace very fine
			20	sand and silt laminations throughout; few black to
			25	dark brown laminations; firm; dense. Ironed stained
				Kirkwood Fm.
		SS#10		SI: 48-50' BLS RE: 2.0'
			16	2.0' - Very dark gray (2.5Y 3/0) silty, clay, trace very
			21	fine sand; light gray very fine sand and silt
50			50	laminations throughout; firm; dense.
			54	
55				

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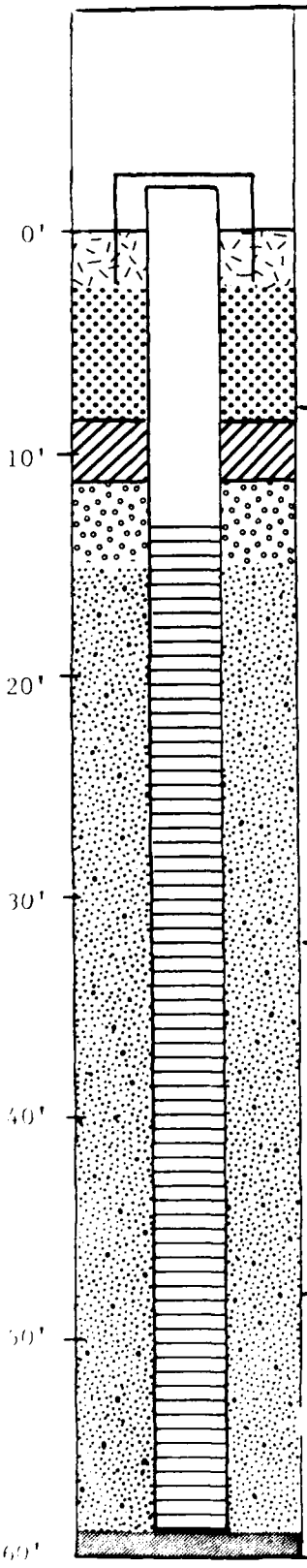
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-[illegible]



Drilling Summary:

Total Depth: 58.5' Drillers: Gary Truver
Borehole Diameter(s): 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 17.97' Bit(s): Hollow stem auger
Top of Casing: 20.07' Drilling Fluid Type: None
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 5 pp. 52-61 Water Level: 13' 11/13/84

Well Design:

Casing: Material: Schedule 40 PVC Screen: Material: Schedule 40 PVC
Diameter: 2" ID 2 3/8"OD Diameter: 2"
Length: 15' Slot: 0.010; 5 slots/inch
Filter: Material: 4Q Sand Setting: 13-58.5'
Setting: 11-14' Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/BenSetting: 9-11'
Setting: LS-9.0' Surface Casing: Steel/PVC
Other: Formation allowed to cave, providing natural sand pack from 14.0' - 58.5'. Protective steel casing cemented into land surface.

Time Log:

	Started		Completed	
Drilling:	11/13/84	0900 hrs	11/13/84	1230 hrs
Installation:	11/13/84	1332 hrs	11/13/84	1522 hrs
Water Level Reading:			11/13/84	1000 hrs
Development:				

Well Development:

Method/Equipment: Air blown for 8 hours; pumped at 10 gpm for minimum 2 hours and until clear

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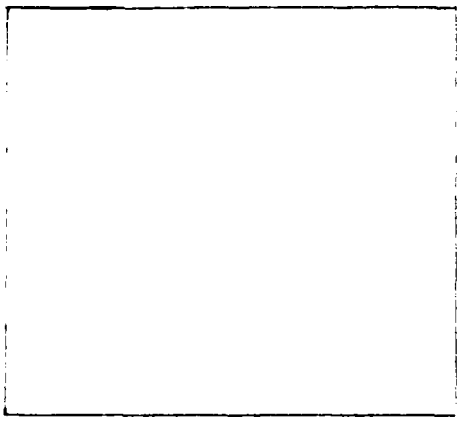
DRILLING LOG

Project: Dover AFB Owner: [illegible] Well No.: [illegible]



Site Sketch

Location: Disposal Area #10 Field Book No.: 5 pp 52-61
Log By: Rick Eades
Driller: Gary Traver
Rig Type: CME Auger
Reference Point: [illegible]
Total Depth: 58.5'
Reference Point Elevation: [illegible]

	Date	Time
Drilling Started:	11/13/84	0900hr
Drilling Completed:	11/13/84	1230
Water Level: 13'	11/13/84	1000

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Recovered SI: Sampling Interval RE: Recovery SS: Split Spoon C: Cuttings DESCRIPTION Graphic Log Trace: 1-5% Little: 15-20% Some: 20-35%	
0					
		C		Medium to dark brown silt, some clay	
		SS#1		SI: 4-6' BLS RE: 1.3'	
			2	1.3' - Light brown (10YR 6/4) fine to medium sand,	
			2	trace silt.	
			3		
			3		
		C		Pale brown sand, trace pebbles	
		C		Bit gravel layer, approximately 0.5' thick	
		SS#2		SI: 9-11' BLS RE: 1.4'	
			3	0.6' - Pale brown [illegible]	
			3	0.7' - White [illegible]	

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	6	
			5	
		C		Light brown to grayish brown coarse sand and cobbles.
		SS#3		SI: 14-16' BLS RE: 1.3'
			3	1.3' - Light grayish brown (2.5Y 7/2) fine to coarse
			4	sand, some pebbles, trace silt, moist.
15			3	
			2	
		C		Light to medium brown, coarse to medium sand, some
				pebbles, trace silt.
		SS#4		SI: 19-21' BLS RE: 0.7'
			4	0.7' - Light grayish brown (2.5Y 7/2) coarse sand
			3	and cobbles, moist.
20			2	
			3	
		C		Brown fine to coarse sand, some pebbles, trace silt, wet.
		SS#5		SI: 24-26' BLS RE: 1.7'
			5	0.3' - Light grayish brown (2.5Y 7/2) coarse to
			5	medium sand, some pebbles.
25				

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DRILLING LOG

cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	10	0.7' - Reddish brown (5YR 3/4) fine to medium sand,
			4	some silt, trace clay, trace pebbles.
				0.7' - Yellowish brown (10YR 6/8) fine to medium sand,
				some cobbles.
		C		Coarse to medium sand, some silt, some pebbles.
		SS#6		SI: 29-31' BLS RE: 1.3'
			12	0.2' - Dark Brown (7.5YR 5/8) sand, some pebbles.
30			6	0.2' - Dark Brown (7.5YR 3/4) sand, trace silt.
			3	0.5' - Yellowish brown (10YR 6/6) sand, some pebbles.
			10	0.4' - Dark brown (7.5YR 5/8) sand, trace silt.
		C		Medium to dark brown, coarse to medium sand, some pebbles.
		SS#7		SI: 34-36' BLS RE: 0.8'
			8	0.8' - Yellowish brown (10YR 6/6) fine to medium sand,
35			5	some silt, trace clay, trace pebbles.
			6	
			6	
		SS#8		SI: 39-41' BLS RE: 1.1'
			6	1.1' - Yellowish brown (10YR 5/6) fine sand, some silt,
40			4	trace clay.

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DRILLING LOG

[illegible]-05] cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	5	
			11	
		SS#9		SI: 44-46' BLS RE: 1.7'
			2	1.7' - Light (10YR 5/6) to medium yellowish brown
			2	(10YR 6/8) fine sand, some silt, some clay.
45			3	
			6	
		SS#10		SI: 49-51' BLS R[illegible]: 1.0'
			5	1.0' - Dark yellowish brown (7.5YR 4/6) fine to
			5	medium sand, some silt.
50			9	
			11	
		C		Light to medium brown, fine to coarse sand.
		SS#11		SI: 54-56' BLS RE: 1.5'
			8	1.5' - Dark yellowish brown (10YR 5/6) fine to coarse
55			8	sand, trace silt.

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DRILLING LOG

cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	9	
			11	
				Driller noted top of clay contact at approximately 58.5' BLS.
		C		Brown coarse to medium sand, with dark gray clay.
		SS#12		SI: 59-61' BLS RE: 1.0'
			6	1.0' - Dark gray (5YR 4/1) clay, silty, dense,
60			6	finely laminated.
			9	
			11	
65				
70				

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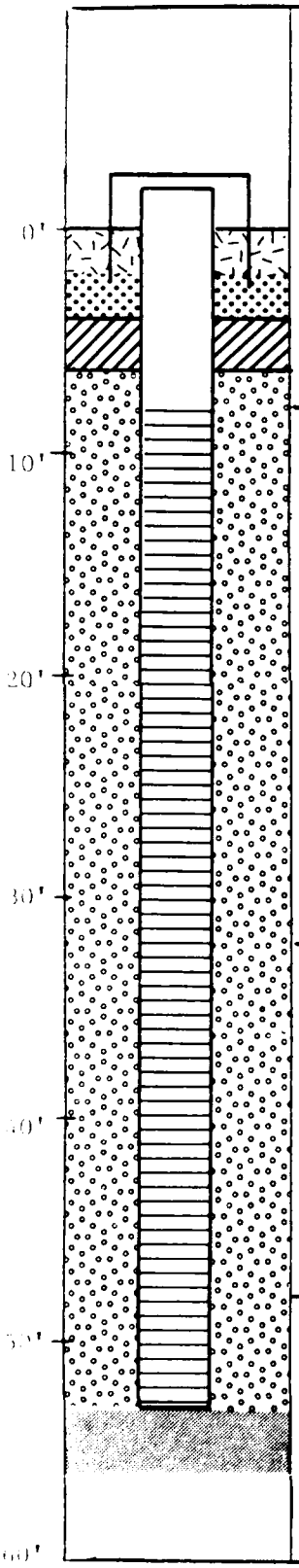
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-06



Drilling Summary:

Total Depth: 53' Drillers: Calvin Wallace
Borehole Diameter(s): 8" Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 15.35' Bit(s): Drag
Top of Casing: 17.40' Drilling Fluid Type: Water
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 4 pp. 115-120 Water Level: 13.1' 11/14/84

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2" ID 2 3/8" OD Diameter: 2"
Length: 10' Slot: 0.010; 5/inch
Filter: Material: 40 Sand Setting: 8'-53'
Setting: 6'-53' Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 4'-6'
Setting: LS-4.0' Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	11/2/84	0710 hrs	11/2/84	0940 hrs
Installation:	11/2/84	1020 hrs	11/2/84	1155 hrs
Water Level Reading:			11/14/84	1550 hrs
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10 gpm for minimum 2 hours and until clear.

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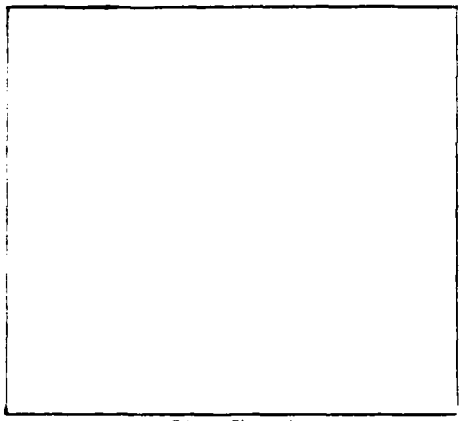
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-06i



Site Sketch

Location: Disposal Area #10
Reference Point: Land Surface
Reference Point Elevation:

Field Book No.: 4 pp 115-120
Log By: Rick Eades
Driller: Calvin Wallace
Rig Type: Failing 1250 Hydraulic Rotary
Total Depth: 53'

	Date	Time
Drilling Started:	11/2/84	0710hrs
Drilling Completed:	11/2/84	0940
Water Level:	13.1' 11/14/84	1550

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				Legend SI: Sampling Interval RE: Recovery SS: Split Spoon C: Cuttings Gradation Trace 1-12 Little 12-20% Some 20-30% Add "Y" 30
		C		Medium brown, clay, some silt.
		SS#1		SI: 5-7' BLS RE: 1.5'
			3	1.5' - Interbedded yellow brown (10YR 6/8) silt
			6	and gray (5YR 7/1) clay
			8	
			10	
		C		Light brown gravel, some sand.
50				

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DRILLING LOG

MW-06j

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	11	SI: 10-12' BLS RE: 0.5'
			10	0.5' - Light gray (5YR 7/1) to white, coarse sand,
			8	cobbly, trace fine sand.
			15	
		C		Light yellow brown, coarse to medium sand, some fine
				sand, trace silt.
		SS#3		SI: 15-17' BLS RE: 0.2'
15			7	0.2' - Tan to grayish brown (2.5Y 6/2) coarse sand,
			5	some fine sand, trace silt.
			6	
			11	
		C		Light grayish brown, coarse to fine sand, some pebbles.
		SS#4		SI: 20-22' BLS RE: 0.6'
20			5	0.6' - Light grayish brown (2.5Y 6/2) coarse to fine
			6	sand, some silt.
			8	
			13	
		C		Yellowish brown, coarse sand, some pebbles, some fine sand.
25				

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DRILLING LOG

MW-06 | cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	6	SI: 25-27' BLS RE: 2.0'
			8	2.0' - Yellowish red (5YR 6/8) medium sand, some fine
			6	sand, trace silt, trace pebbles.
			12	
		C		Yellow brown coarse sand, some cobbles, trace silt.
30		SS#6		SI: 30-32' BLS RE: 0.2'
			11	0.2' - Brownish yellow (10YR 6/8) medium to fine
			9	sand, trace silt.
			13	
			20	
		C		Yellow brown coarse sand, some pebbles.
		SS#7		SI: 35-37' BLS RE: 0.7'
35			16	0.7' - Brownish yellow (10YR 6/8) medium to coarse
			14	sand, some fine sand.
			11	
			15	
		C		Yellow brown, coarse to medium sand.
40				

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DRILLING LOG

MW-06j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	17	SI: 40-42' BLS RE: 0.7'
			23	0.7' - Yellowish brown (10YR 6/8) very coarse sand
			21	and cobbles, up to 1.0" in diameter, some
			36	fine sand.
		C		Yellowish brown, medium sand, some pebbles.
45		SS#9		SI: 45-47' BLS RE: 0.7'
			18	0.7' - Dark reddish brown (10YR 5/6) coarse sand,
			20	some pebbles.
			24	
			29	
		C		Yellowish, red brown, coarse sand, some pebbles.
50		SS#10		SI: 50-52' BLS RE: 0.7'
			25	0.7' - Yellowish brown (10YR 6/8) cobbles, some
			33	coarse sand.
			36	
			39	
				Driller identified top of layer at approximately 53' BLS.
		C		Coarse sand with trace dark gray clay.
55				

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DRILLING LOG

MW-06j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	13	SI: 55-57' BLS RE: 2.0'
			14	2.0' - Dark gray (5Y 4/1), dense, finely laminated
			38	clay, silty.
			30	
60				
65				
70				

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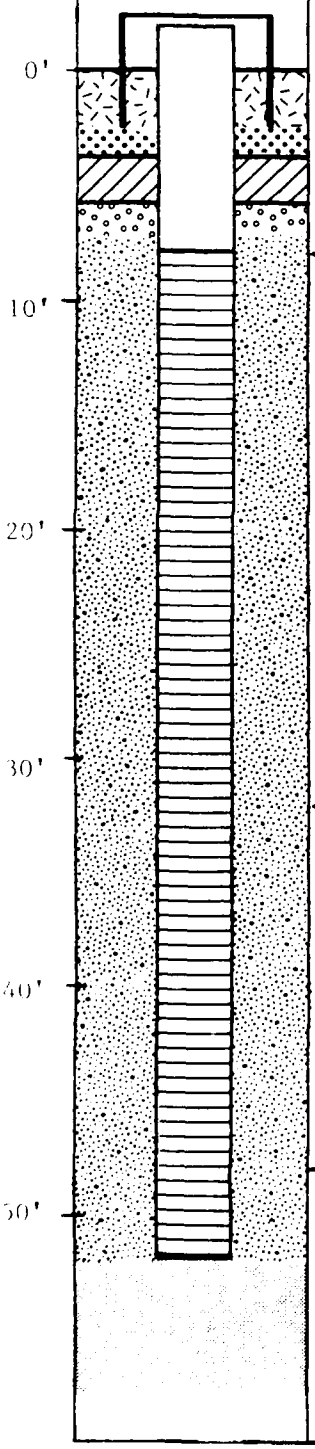
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-07



Drilling Summary:

Total Depth: 52' BLS
Drillers: Gary Truver
Borehole Diameter(s): 6"
Walton Drilling
Rig Type: CME-55/Auger
Elevation: Land Surface: 10.37'
Bit(s): Auger
Top of Casing: 12.57'
Drilling Fluid Type: Water
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 2 pp. 6-19
Water Level: 6.5' BLS 11/8/84

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2" ID 2 1/4" OD
Diameter: 2"
Length: 10'
Slot: 0.010; 5/inch
Filter: Material: Formation/4Q Sand
Setting: 8'-52' BLS
Setting: 7.3'-52' BLS/5.8'-7.3' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement/Ben
Setting: 3.8' - 5.8' BLS
Setting: 2.5' - 3.8' BLS
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	11/31/84	1440 hrs.	11/1/84	0945 hrs.
Installation:	11/01/84	1038 hrs.	11/1/84	1300 hrs.
Water Level Reading:	7' BLS	11/1/84	6.5' BLS	11/8/84
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours; pumped at 10 gpm for minimum 2 hours and until clear.

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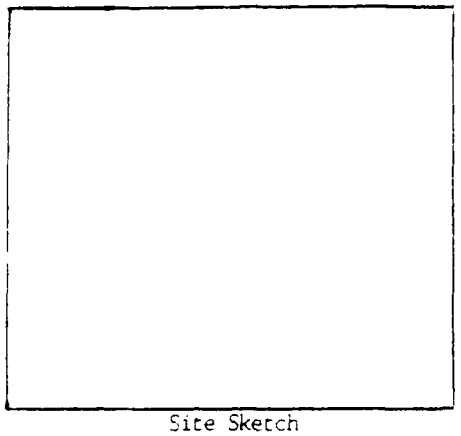
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** [illegible]



Site Sketch

Location: Disposal Site
[illegible]
Log By: Andris Lapins
Driller: Gary Truver (Walton)
Rig Type: CME-55 : Auger
Reference Point: Land Surface
Total Depth: 52' BLS
Reference Point Elevation: 10.37'

	Date	Time
Drilling Started:	10/31/84	1440
Drilling Completed:	11/1/84	1300
Water Level:	6.5' BLS 11/8/84	0859

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Heavy gravel layer at 2-3' BLS: large subangular quartz
				pebbles 0.1-0.2' in diameter.
		SS#1		SI: 4-6' BLS RE: 0.8'
			5	0.8' - Dark grayish brown (2.5Y 4/2) silty sand, some gravel
			5	and clay; poorly sorted; dry to moist; large rounded
5			5	quartz pebbles.
			5	
		C		Dark gray (2.5Y 4/0) fine to coarse silty sand, some gravel
				and clay; poorly sorted, moist to wet. Strong hydrocarbon odor
				in cuttings from 7-6' BLS. Sediments submerged in water
				leave sheen on water surface.
		SS#2		SI: 9-11' BLS RE: 1.8'
			1	1.8' - Gray (5Y 5/1) fine sand, some silt, trace clay;
10			1	loose to medium dense; saturated; [illegible]

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	1	water surface when submerged.
		SS#3		SI: 14-16' BLS RE: 1.2'
			1	0.1' - Same as above
			2	1.1' - Pale yellow (5Y 8/4) fine sand; some silt; trace
15			2	clay; loose; wet; no hydrocarbon odor or sheen as
			2	previously observed.
		SS#4		SI: 19-21' BLS RE: 1.0
			2	1.0' - Brownish yellow (10YR 6/8) fine sand, some silt;
20			3	wet.
			3	
			2	
		SS#5		SI: 24-26 BLS' RE: 0.4'
			3	0.4' - Brownish yellow (10YR 6/8) fine sand, trace silt and
25			3	gravel; loose; wet.

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DRILLING LOG

MW-07j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	3	
			4	
		C		Gray silty clayey sand.
		SS#6		SI: 29-31' BLS RE: 1.4'
			3	0.65' - Same as 24-26' BLS
30			4	0.75' - Brownish yellow (10YR 6/8) coarse sand and gravel,
			5	trace silt; loose: wet.
			5	
				Sands heaved in auger @ 34' ; no sample taken at 34' BLS.
35				
		SS#7		SI: 39-41' BLS RE: 0.9'
			7	0.9' - Strong brown (7.5YR 5/8) fine sand, little silt;
40			8	well sorted; wet.

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DRILLING LOG

MW-07j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#7	11	
			13	
		SS#8		SI: 44-46' BLS RE: 0.8'
			8	0.8' - Same as above
			8	
45			12	
			14	
		SS#9		SI: 49-51' BLS RE: 0.9'
			8	0.9' - Strong brown fine sand, some silt, trace gravel; wet.
			11	
50			17	
			27	
				Driller reports entering top of clay layer at @ 52' BLS.
		SS#10		SI: 54-56' BLS RE: 1.9'
			2	1.9' - Very dark gray (5Y 3/1) silty clay; trace very fine
55			4	sand with light to dark gray (2.5Y 4/0) very fine

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DRILLING LOG

MW-07j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#10	6	sand and silt laminations throughout; firm; dense;
			8	moist.
60				
65				
70				

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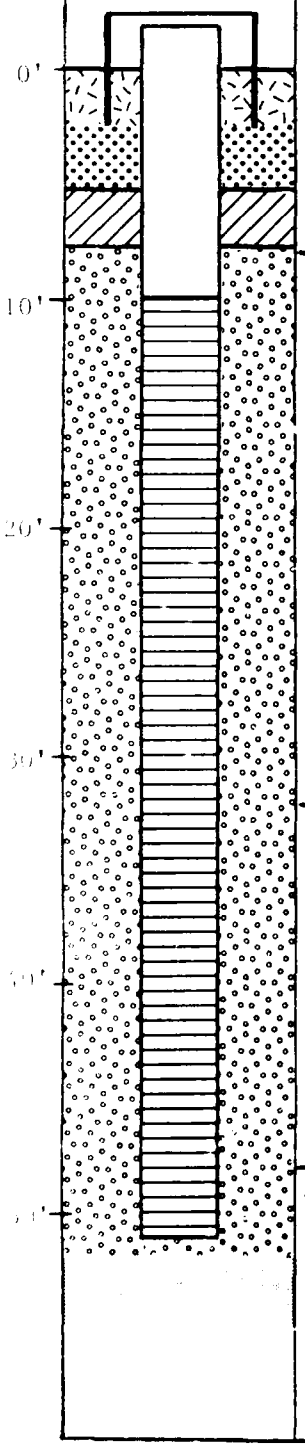
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-08J



Drilling Summary:

Total Depth: 51' BLS Drillers: Calvin Wallace
Borehole Diameter(s): 6 ½" Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 12.5' Bit(s): Drag
Top of Casing: 14.2' Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Andris Lapins Amount Use:
Log Book No. 3 pp. 1-16 Water Level: 8.9' BLS 1/9/85

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2" ID 2 1/4" OD Diameter: 2"
Length: 12' Slot: 0.010; 5/inch
Filter: Material: 4Q Sand Setting: 10-51' BLS
Setting: 7.9-51' BLS Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement/Ben Setting: 5.1-7.9' BLS
Setting: 2.3-5.1' BLS Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	11/7/84	1310 hrs	11/8/84	1546 hrs
Installation:	11/8/84	1600 hrs	11/8/84	1711 hrs
Water Level Reading:			1/9/85	8.9' BLS
Development:				

Well Development:

Method/Equipment: Air blown for 5 hours; purged at 10gpm for minimum 2 hours and until clear.

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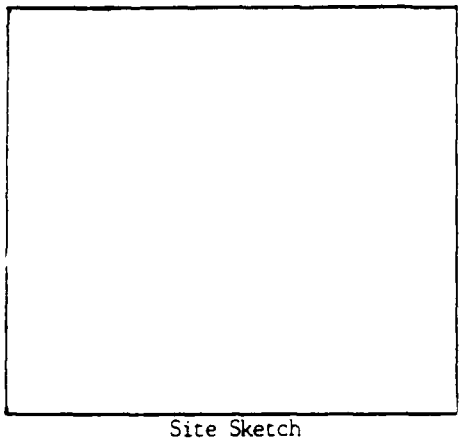
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-08j



Site Sketch

Location: Disposal Site D-10
Reference Point: Land Surface
Reference Point Elevation: 12.5'

Field Book No.: 3 pp 1-14
Log By: Andris Lapins
Driller: Calvin Wallace (Delmarva)
Rig Type: Failing 1250 Hydraulic Rotary
Total Depth: 51' BLS

	Date	Time
Drilling Started:	11/7/84	1310 hrs
Drilling Completed:	11/8/84	1546
Water Level:	8.9' BLS	1/9/85

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				Legend: SI: Sampling Interval; RE: Recovery; SS: Split Spoon; C: Cuttings. Gradation: Trace 1-12%; Little 12-20%; Some 20-30%; Add "Y" >30%
0				
		C		Rig shimmied at 3-4 BLS. Heavy gravel layer; rounded pebbles in cuttings.
5		SS#1		SI: 5-7' BLS RE: 1.1'
			20	0.6' - Yellow fine to medium sand, trace silt, clay and
			51	gravel; moist.
			99	0.4' - White very fine sand, some gravel, trace silt;
			75	firm; dry.
				0.1' - Light olive gray fine to coarse sand, some silt and gravel, trace clay; poorly sorted; firm; dry.
10				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	8	SI: 10-12' BLS RE: 0.4'
			7	0.4' - Light to dark gray fine sand, some silt, trace
			7	gravel; wet; emits distinct hydrocarbon odor.
			10	
		SS#3		SI: 15-17' BLS RE: 1.0'
15			8	0.7' - Pale yellow fine sand, trace silt and gravel; wet.
			10	0.3' - Yellow fine sand, trace silt; wet.
			7	
			9	
		SS#4		SI: 20-22' BLS RE: 1.2'
20			9	0.85' - Brown silty very fine sand; wet.
			9	0.35' - Yellow very fine sand, some silt; medium dense; wet.
			7	
			9	
25				

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DRILLING LOG

MW-08j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	9	SI: 25-27' BLS RE: 0.7'
			11	0.7' - Reddish yellow very fine to fine sand, some
			11	silt, trace fine gravel; wet.
			13	
		SS#6		SI: 30-32' BLS RE: 0.9'
30			19	0.9' - Yellow to reddish yellow medium to coarse sand,
			18	little silt, some gravel; loose; wet.
			21	
			24	
		SS#7		SI: 35-37' BLS RE: 1.1'
35			26	0.8' - Medium to coarse sand, some silt, trace light gravel;
			14	loose; wet.
			18	0.3' - Yellow to pale yellow fine sand, some silt; wet.
			29	
40				

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DRILLING LOG

MW-08j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	12	SI: 40-42' BLS RE: 1.4'
			16	0.65' - Brown silty very fine sand; wet.
			21	0.75' - Pale yellow to yellow very fine sand, some silt.
			29	
		SS#9		SI: 45-47' BLS RE: 0.3'
45			23	0.3' - Reddish yellow medium to coarse sand, little silt,
			37	trace light gravel. Large pebble in cave material in
			24	top of sample inhibited penetration.
			25	
		SS#10		SI: 50-51' BLS RE: 0.3'
50			61	0.2' - Dark brown fine sand, trace silt; dense; firm; iron rich
			100/1.5"	0.1' - Yellow to reddish yellow fine sand, trace silt. Heavy
				gravel in cave material at top.
				Driller indicates penetrating clay layer at @ 52' BLS.
		SS#11		SI: 53.5-55' BLS RE: 1.7'
			25	1.7' - Very dark gray silty clay, trace very fine sand; light
			32	gray very fine sand and silt laminations throughout;
55			100/4"	firm; dense.

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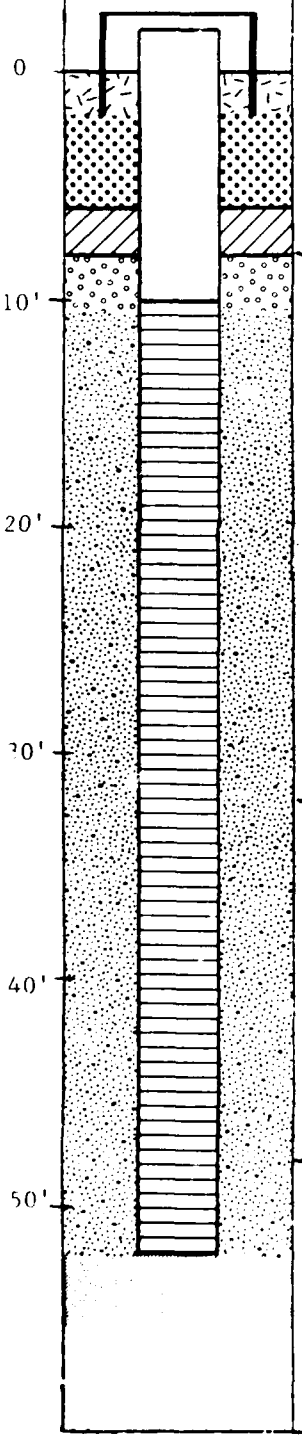
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-99



Drilling Summary:

Total Depth: 52' BLS
Drillers: Gary Truver
Borehole Diameter(s): 6"
(Walton Drilling)
Rig Type: CME-55 : Auger
Elevation: Land Surface: 14.55'
Bit(s): Auger
Top of Casing: 16.35'
Drilling Fluid Type: Water
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 2 pp. 19-30
Water Level: 10' BLS 11/1/84
9.96' BLS 11/8/84

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2" ID 2 1/4"OD
Diameter: 2"
Length: 12'
Slot: 0.010; 5/inch
Filter: Material: Formation/#0 Sand
Setting: 10'-52' BLS
Setting: 10.4-52'/8-10.4' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement/Ben
Setting: 6-8' BLS
Setting: 2.4'-6' BLS
Surface Casing: steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started	Completed
Drilling:	11/1/84 1524 hrs	11/2/84 0829 hrs
Installation:	11/2/84 0837 hrs	11/2/84 1027 hrs
Water Level Reading:	10' BLS 11/1/84 1552	9.96' BLS 11/8/84
Development :		

Well Development:

Method/Equipment: Air blown for 8 hours, surged for 1 hour
8 hours and until clear.

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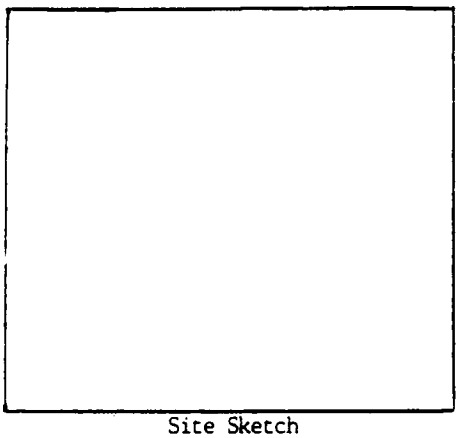
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-09i



Site Sketch

Location: Disposal Site D-10
Log By: Andris Lapins
Driller: Gary Truver (Walton)
Rig Type: CME 55 : Auger
Reference Point: Land Surface
Total Depth: 52.2' BLS
Reference Point Elevation: 14.55'

	Date	Time
Drilling Started:	11/1/84	1524hrs
Drilling Completed:	11/2/84	1045hrs
Water Level:	9.96' BLS 11/8/84	0925hrs

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Yellowish brown clay and silt, some sand. Rig shimmied at
				@ 2.5 BLS - heavy gravel layer; large (0.1-0.2' diameter)
				rounded pebbles; small piece of fibre glass (@ 1").
		SS#1		SI: 4-6' BLS RE: 1.8'
			4	1.4' - Light gray (5Y 7/2) clay, some silt, little sand and
5			8	gravel; firm; dense; moist.
			14	0.4' - Light gray to white (5Y 7/2-8/2) very fine sand; some
			17	silt, trace gravel; dry to moist.
				Heavy gravel layer at @ 7' BLS; rig shimmied
		SS#2		SI: 9-11' BLS RE: 1.3'
			6	1.3' - Pale yellow (5Y 7/3) fine to coarse sand and gravel,
10			7	some silt, few large pebbles; poorly sorted; wet.

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DRILLING LOG

MW-09j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	7	Reworked "urban land".
			8	
				Static water level in auger - 10' BLS.
		SS#3		SI: 14-16' BLS RE: 1.8'
			1	1.8' - White (5Y 8/2) very fine sand, some silt, trace clay
15			1	and gravel; loose; saturated.
			1	
			2	
		SS#4		SI: 19-21' BLS RE: 1.1'
			3	1.1' - same as above
20			2	
			1	
			1	
		SS#5		SI: 24-26' BLS RE: 1.6'
			2	0.6' - same as above
			2	1.0' - Brownish yellow (10YR 6/8) fine to medium sand, some
25			2	silt, little gravel; loose; wet. 1" coarse sand and

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DRILLING LOG

MW-09j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	3	gravel layer at top and bottom of sample.
		SS#6		SI: 29-31' BLS RE: 0.8'
			5	0.8' - Brownish yellow very fine to fine silty sand; large
30			2	iron concretion at top of sample; wet.
			3	
			4	
		SS#7		SI: 34-36' BLS RE: 1.8'
			2	1.8' - Strong brown (7.5YR 5/8) coarse sand and gravel,
35			3	some silt, few rounded quartz pebbles; loose;
			5	wet.
			5	
		SS#8		SI: 39-41' BLS RE: 0.3'
			12	0.3' - same as above
			11	
40			10	

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DRILLING LOG

MW-09j cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	11	
				Static water level in auger - 12.1' BLS.
		SS#9		SI: 44-46' BLS RE: 0.6'
			5	0.6' - Strong brown (7.5YR 5/8) medium sand, some silt
45			6	and gravel; few rounded pebbles; wet.
			10	
			12	
		SS#10		SI: 49-51' BLS RE: 0.85'
			7	0.85' - Yellowish brown (10YR 5/8) fine sand, some silt,
50			8	trace clay; wet.
			10	
			12	
				Driller indicates entering clay layer at @ 52.5' BLS.
		SS#11		SI: 53-55' BLS RE: 1.4'
			2	0.2' - Brownish yellow (10YR 6/8) silty clay with light gray
			5	laminations throughout; soft; dense.
			1	1.2' - Very dark gray silty clay, trace very fine sand; light
			7	gray very fine sand and silt laminations throughout;
55				firm; dense.

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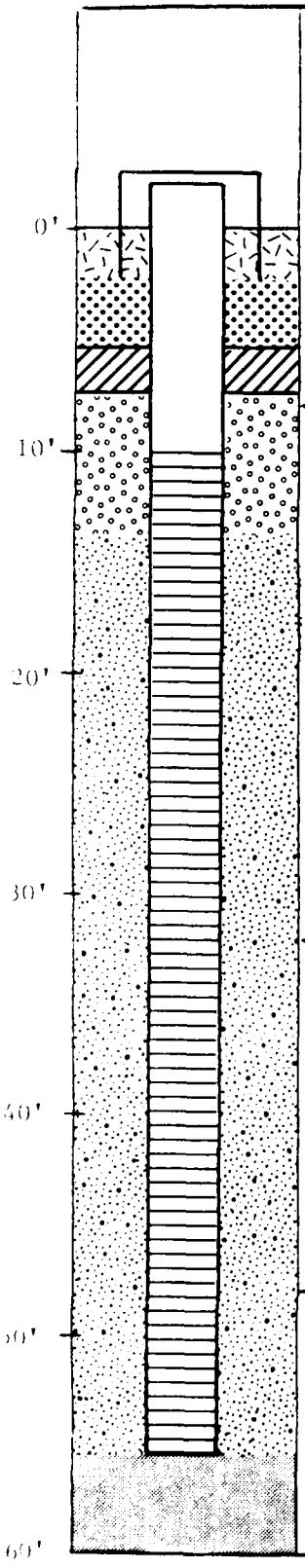
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW-10



Drilling Summary:

Total Depth: 56' Drillers: Gary Truver
Borehole Diameter(s): 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 19.40' Bit(s): Hollow stem auger.
Top of Casing: 22.38' Drilling Fluid Type: None
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 4 pp. 50-65 Water Level: 11' BLS 10/25/84

Well Design:

Casing: Material: Schedule 40 PVC Screen: Material: Schedule 40 PVC
Diameter: 2" ID 2 3/8"OD Diameter: 2"
Length: 12.0' Slot: 0.010; 5 slots/inch
Filter: Material: 40 Sand Setting: 10-56' BLS
Setting: 8-13' BLS Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 6-8' BLS
Setting: LS-6' Surface Casing: Steel/PVC
Other: Formation allowed to cave, providing natural sand pack from 13.0 - 56.0'. Protective steel casing cemented into land surface.

Time Log:

	Started		Completed	
Drilling:	10/25/84	0839 hrs	10/25/84	1152 hrs
Installation:	10/25/84	1152 hrs	10/25/84	1510 hrs
Water Level Reading:			10/25/84	1155 hrs
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped for 2 hours and until clear

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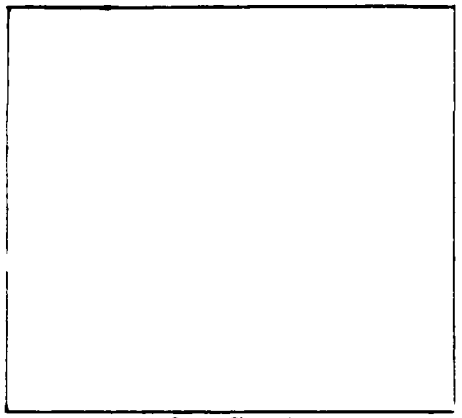
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW- 10



Site Sketch

Location: Disposal Area #4
Reference Point: Land Surface
Reference Point Elevation: 19.40'

Field Book No.: 4 pp 50-65
Log By: Rick Eades
Driller: Gary Truver
Rig Type: CME Auger
Total Depth: 56'

	Date	Time
Drilling Started:	10/25/84	0839hr
Drilling Completed:	10/25/84	1152
Water Level: 11'	10/25/84	1155

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				Legend: SI: Sampling Interval; RE: Recovery; SS: Split Spoon; C: Cuttings. Gradation: Trace 1-12%, Little 12-20%, Some 20-30%, Add "Y" 30%
0				
		C		Orange brown sand and gravel, with grayish brown sand.
		SS#1		SI: 4-5.5' BLS RE: 1.4'
			3	0.7' - Orange brown (7.5YR 5/8) sand, some silt, trace clay.
5			2	0.7' - Dark grayish brown (5Y 4/1) clay, some silt with
			2	thin reddish orange laminations.
		C		Medium to light gray silt, some clay.
		SS#2		SI: 9-10.5' BLS RE: 1.4'
			3	1.4' - Dark gray (5Y 4/1) clay grading down to clay
10			4	interbedded with thin reddish brown silt stringers.

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DRILLING LOG

MW- 10 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	4	
		C		Light gray sand, wet.
		SS#3		SI: 14-15.5' RE: 1.4'
			3	0.9' - Light gray (5YR 7/1) medium to coarse sand, some silt.
			3	0.5' - Interbedded yellow brown (5YR 5/8) and brownish gray
15			4	(5YR 6/3) sand, wet.
		C		Gray to grayish brown, medium to coarse sand, some silt.
		SS#4		SI: 19-20.5' BLS RE: 1.4'
			2	0.3' - Light gray (5YR 7/1) medium to coarse sand.
			6	0.7' - Interbedded light gray (5YR 6/2) silt and reddish
20			6	brown (5YR 6/8) clay.
				0.4' - Light gray (5YR 7/1) coarse sand.
		C		Tan, medium to coarse sand, some silt, some clay.
		SS#5		SI: 24-25.5' BLS RE: 0.9'
			3	0.2' - Grayish brown (7.5YR 7/2) medium sand.
25			6	0.3' - Interbedded red brown (5YR 6/8) clay and light

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DRILLING LOG

MW- 10 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	8	gray (5YR 7/1) silt.
				0.4' - Light gray (5YR 7/1) medium to coarse sand.
		C		Gravel layer, approximately 1.0' thick.
		SS#6		SI: 29-30.5' BLS RE: 0.5'
			5	0.5' - Light gray gravel (5YR 7/1) with orange brown
30			7	streaks (5YR 6/8) of coarse sand. Quartz cobbles
			9	up to 1.2" in diameter.
		SS#7		SI: 34-35.5' BLS RE: 0.5'
			5	0.3' - Brown (7.5YR 7/2) coarse sand, some gravel, some
			5	fine sand.
35			7	0.2' - Reddish brown (7.5YR 5/8) coarse sand, some fine sand.
		C		Brownish gray, coarse sand.
		SS#8		SI: 39-40.5' BLS RE: 0.3'
			4	0.3' - Light gray (5YR 7/1) medium to coarse sand, trace
40			5	silt, trace gravel. Disseminated very fine

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DRILLING LOG

MW- 10 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	9	black grains.
		C		Light brownish gray, fine sand.
		SS#9		SI: 44-45.5' BLS RE: 0.0'
			8	Attempted split spoon sample, no recovery, considered
45			10	interval to be composed of clean sand.
			12	
		C		Light brown to yellowish brown, fine sand, very wet.
		SS#10		SI: 49-50.5' BLS RE: 0.5'
			12	0.5' - Greenish brown (2.5Y 5/6) coarse to medium sand,
50			10	some pebbles, some fine sand, trace silt.
			9	
		SS#11		SI: 54-55.5' BLS RE: 0.0'
			28	Attempted split spoon sample, no recovery, considered
55			20	interval to be composed of clean sand.

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DRILLING LOG

MW- 10 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	8	
				Driller indicated change in lithology at approximately
				56' BLS probably hit top of the clay layer.
		C		Sand, some clay.
		SS#12		SI: 59-60.5' BLS RE: 1.5'
			4	1.5' - Dark gray (5Y 4/1) clay, silty, dense,
			5	finely laminated.
60			7	
65				
70				

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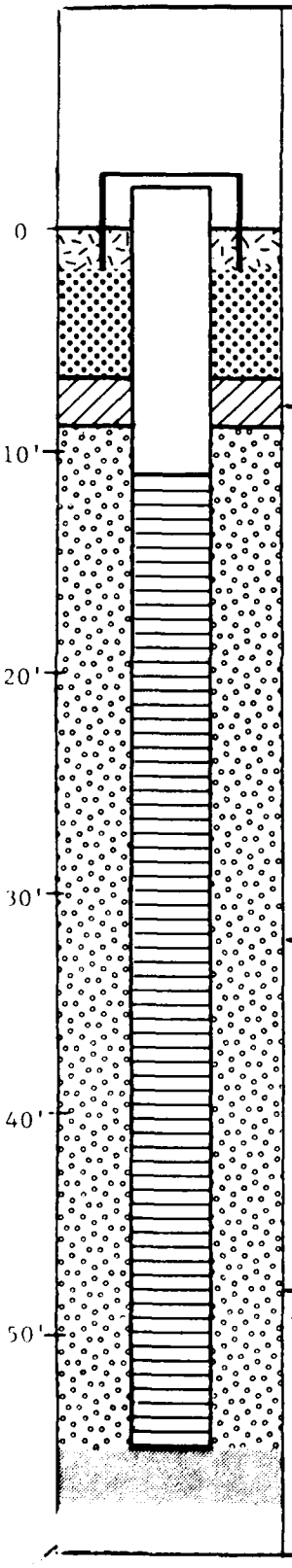
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW- 11



Drilling Summary:

Total Depth: 55' BLS
Drillers: Calvin Wallace
Borehole Diameter(s): 6½"
Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 19.75'
Bit(s): Drag
Top of Casing: 21.76'
Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 1 pp. 31-44
Water Level: 10.7' BLS 10/29/84

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2" ID 2 1/4" OD
Diameter: 2"
Length: 13'
Slot: 0.010; 5/inch
Filter: Material: 4Q Sand
Setting: 11'-55' BLS
Setting: 8.8'-55' BLS
Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben
Setting: 6.5'-8.8' BLS
Setting: 3.5'-6.5' BLS
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	10/25/84	1200 hrs	10/26/84	1008 hrs
Installation:	10/26/84	1021 hrs	10/26/84	1150 hrs
Water Level Reading:			10.7' BLS	10/29/84
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped for minimum 2 hours and until clear.

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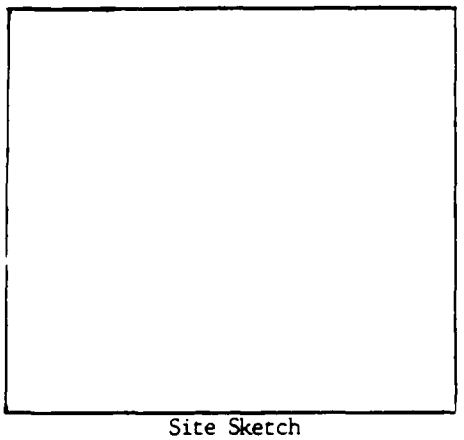
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW - 11



Site Sketch

Location: Disposal Site D-4
Field Book No.: 1 pp 31-44
Log By: Andris Lapins
Driller: Calvin Wallace (Delmarva)
Rig Type: Hydraulic Rotary Falling 1250
Reference Point: Land Surface
Total Depth: 55' BLS
Reference Point Elevation: 19.75'

	Date	Time
Drilling Started:	10/25/84	1200 hrs
Drilling Completed:	10/26/84	1150
Water Level:	10.7' BLS	10/29/84

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Brown fine sand, some silt.
5		SS#1		SI: 5-7' BLS RE: 1.4'
			7	0.8' - Olive yellow (5Y 6/6) silty clay, trace very fine sand
			9	grading to olive yellow clay, some silt; brown to
			8	yellow brown mottling throughout; moist; firm.
			11	0.2' - Light olive brown (2.5Y 5/4) clay, some silt; strong
				brown mottling; moist; soft; dense.
				0.4' - Gray medium sand, some clay, few pebbles; brown
				mottling; moist; firm.
10				

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DRILLING LOG

MW- 11 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	9	SI: 10-12' BLS RE: 1.4'
			19	0.5' - Gray (5Y 6/1) clay; moist; soft, dense.
			26	0.45' - Gray (2.5Y 5/5) fine to medium sand, trace silt and
			40	clay, few rounded quartz pebbles. Cement-like in
				appearance.
				0.45' - Yellowish brown (10YR 5/8) fine to medium sand, trace
				silt and clay.
		SS#3		SI: 15-16.5' BLS RE: 1.5'
15			9	1.2' - Brownish yellow (10YR 6/8) fine sand, trace silt; wet.
			6	0.3' - Pale yellow (2.5Y 7/4) fine sand; wet.
			10	
		SS#4		SI: 20-22' BLS RE: 0.6'
20			10	0.6' - Pale yellow (5Y 7/3) fine to coarse sand, some
			8	gravel; poorly sorted; few emerald green spots -
			10	mineral.
			11	
25				

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DRILLING LOG

MW- 11 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	12	SI: 25-27' BLS RE: 0.7'
			15	0.7' - Same as above
			14	
			16	
30		SS#6		SI: 30-32' BLS RE: 0.5'
			12	0.5' - Same as above
			13	
			15	
			12	
35		SS#7		SI: 35-37' BLS RE: 0.75'
			11	0.75 - Same as above
			8	
			15	
			21	
40				

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DRILLING LOG

MW - 11 cont

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	12	SI: 40-42' BLS RE: 0.7'
			16	0.7' - Same as above
			23	
			26	
		SS#9		SI: 45-47' BLS RE: 0.5'
45			22	0.5' - Brownish yellow (10YR 6/8) fine to coarse sand, trace
			30	silt, few rounded quartz pebbles; wet.
			27	
			33	
		SS#10		SI: 50-52' BLS RE: 0.5'
50			32	0.5' - Same as above
			38	
			39	
			49	
				Driller reports hitting clay layer at @ 55' BLS.
55				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	15	SI: 55-57' BLS RE: 2.0'
			15	2.0' - Very dark olive gray silty clay, trace very
			13	fine sand; dry to moist; dense; stiff; light
			30	gray very fine sand and silt laminations
				throughout.
60				
65				
70				

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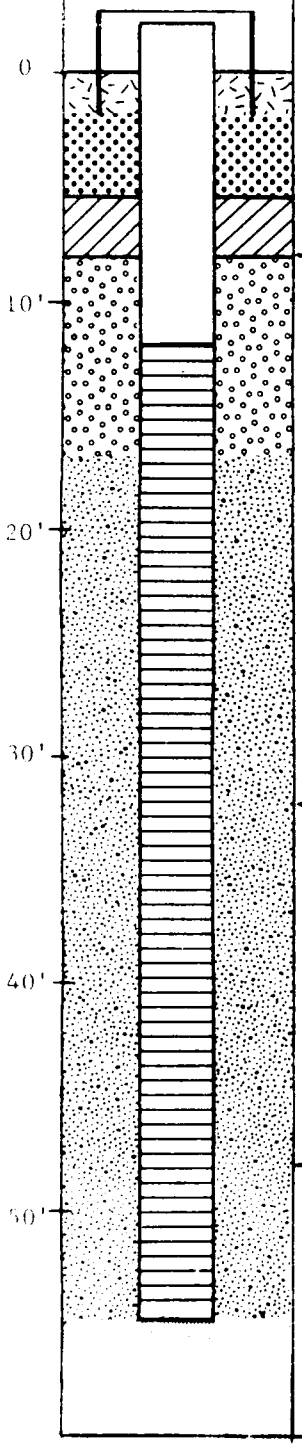
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW- 12



Drilling Summary:

Total Depth: 55' BLS
Drillers: Gary Truver
Borehole Diameter(s): 6"
Walton Drilling
Rig Type: CME-55 : Auger
Elevation: Land Surface: 19.74'
Bit(s): Auger
Top of Casing: 21.81'
Drilling Fluid Type: Water
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 1 pp. 46-54
Water Level: 10.91' BLS 1/9/85

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2" ID 2 1/4"OD
Diameter: 2"
Length: 13'
Slot: 0.010; 5/inch
Filter: Material: Formation /4Q San
Setting: 11'-55' BLS
Setting: 13.5'-55' BLS/9'-13.5' BLS
Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben
Setting: 6.5'-9' BLS
Setting: 2.5'-6.5' BLS
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	10/26/84	1510 hrs	10/29/84	1220 hrs
Installation:	10/29/84	1309 hrs	10/29/84	1337 hrs
Water Level Reading:			1/9/85	10.91 BLS
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10 gpm for minimum 2 hours and until clear.

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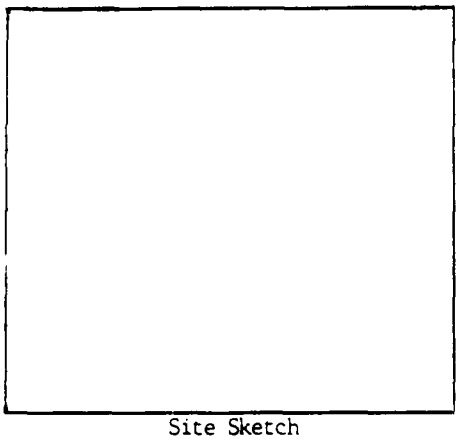
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-12



Site Sketch

Location: Disposal Site D-4
Field Book No.: 1 pp 46-54
Log By: Andris Lapins/Rick Eades
Driller: Gary Truver (Walton)
Rig Type: CME-55 : Auger
Reference Point: Land Surface
Total Depth: 55' BLS
Reference Point Elevation: 19.74'

	Date	Time
Drilling Started:	10/26/84	1510
Drilling Completed:	10/29/84	1337
Water Level:	10.91' BLS	1/9/85

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		SS#1		SI: 4-5.5' BLS RE: 1.35'
			5	0.85' - Light to dark gray clay, some silt, trace gravel;
5			10	vertical streaks of staining; black laminations.
			10	0.5' - Reddish brown medium sand, some silt.
		SS#2		SI: 9-10.5' BLS RE: 1.35'
			3	0.35' - Gray clay, some silt, trace heavy gravel.
10			5	1.0' - Light gray clay; streaks of iron staining.

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	6	
		C		Light brown clay
		SS#3		SI: 14-15.5' BLS RE: 1.4'
			2	0.5' - Dark gray clay, some silt, trace sand, streaks of
			1	iron staining.
15			2	0.3' - Reddish brown fine sand, trace silt.
				0.6' - Light gray medium sand, trace silt; wet.
		SS#4		SI: 19-20.5' BLS RE: 1.0'
			2	1.0' - Light gray (5Y 7/1) fine sand, trace silt; wet.
20			3	
			4	
		SS#5		SI: 24-25.5' BLS RE: 1.2'
			8	1.2' - Brownish yellow (10YR 6/8) fine to coarse sand,
			7	trace gravel, few rounded pebbles; wet.
25			7	

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25				
		SS#6		SI: 29-31' BLS RE: 1.0'
			7	0.2' - Brownish yellow (10YR 6/8) fine to coarse sand, trace
			5	silt; wet.
30			8	0.05' - Very pale brown clay stringer.
			9	0.5' - Light gray fine to coarse sand, trace silt; loose;
				wet; small green spots-mineral.
				0.25' - Brownish yellow coarse sand and light gravel;
				poorly sorted; wet.
		SS#7		SI: 34-35.5' BLS RE: 1.2'
			7	0.8' - Gray fine sand (cave-in material)
			7	0.4' - Gray to olive fine to coarse sand, some light gravel;
35			10	few rounded pebbles; emerald green spots as in
				previous sample; wet.
		SS#8		SI: 39-41' BLS RE: 0.65'
			7	0.65' - Yellow fine to medium sand grading to fine to coarse
			7	sand with little light gravel; few rounded pebbles;
40				

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DRILLING LOG

MW- 12 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	10	wet.
			13	
		SS#9		SI: 44-46' BLS RE: 0.6'
			6	0.6' - Yellow (2.5Y 7/6) fine to coarse sand, trace silt;
45			7	few quartz pebbles; poorly sorted; loose; wet.
			9	
			16	
		SS#10		SI: 49-51' BLS RE: 0.6'
			8	0.6' - Yellow (2.5Y 7/6) fine to coarse sand, some light
50			8	gravel; poorly sorted; wet.
			13	
			16	
		SS#11		SI: 54-56' BLS RE: 0.85'
			10	0.75' - Strong brown (7.5YR 5/8) medium to coarse sand,
			11	trace silt and clay; loose; wet.
55			11	0.10' - Very dark gray (5Y 3/1) silty clay, trace very

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DRILLING LOG

MW - 12 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	16	fine sand; light gray silt and very fine sand laminations throughout; firm; dense.
60				
65				
70				

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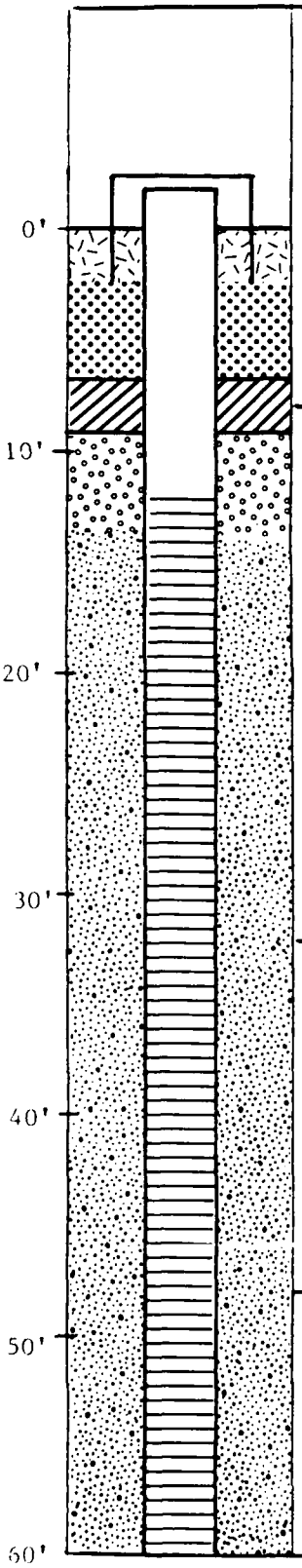
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW- 13



Drilling Summary:

Total Depth: 61.5' Drillers: Gary Truver
Borehole Diameter(s): 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 20.36' Bit(s): Hollow stem auger
Top of Casing: 22.97' Drilling Fluid Type: None
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 4 pp. 65-83 Water Level: 11.5' BLS 10/26/84

Well Design:

Casing: Material: Schedule 40 PVC Screen: Material: Schedule 40 PVC
Diameter: 2" ID 2 3/8"OD Diameter: 2"
Length: 13.5' Slot: 0.010; 5 slots/inch
Filter: Material: 4Q Sand Setting: 11.5-61.5'
Setting: 9.0-13.5' Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 7.0-9.0'
Setting: LS-7.0' Surface Casing: Steel/PVC
Other: Formation allowed to cave, providing natural sand pack from 13.5 - 61.5'. Protective steel casing cemented into land surface.

Time Log:

	Started	Completed
Drilling:	10/25/84 1630 hrs	10/26/84 1020 hrs
Installation:	10/26/84 1030 hrs	10/26/84 1405 hrs
Water Level Reading:		10/26/84 1150 hrs
Development :		

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10gpm for minimum 2 hours and until clear.

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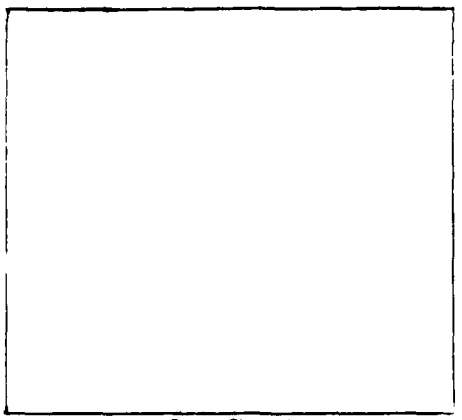
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** M-13



Site Sketch

Location: Disposal Area #4
Reference Point: Land Surface
Reference Point Elevation: 20.36'

Field Book No.: 4 pp 65-83
Log By: Rick Eades
Driller: Gary Truver
Rig Type: CME Auger
Total Depth: 61.5'

	Date	Time
Drilling Started:	10/25/84	1630hr
Drilling Completed:	10/26/84	1020
Water Level:	11/5' 10/26/84	1150

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				Legend SI: Sampling Interval RE: Recovery SS: Split Spoon C: Cuttings Gradation Trace 1-12% Little 12-20% Some 20-30% Add "Y" 30%
0				
		C		Dark brown silt, some sand, some pebbles.
		SS#1		SI: 4-5.5' BLS RE: 1.2'
			4	0.2' - Dark brown (7.5YR 5/4) silt, some clay, trace sand.
5			6	0.8' - Dark gravish brown (5YR 6/2) sand, some silt,
			8	trace clay.
				0.2' - Brown (10YR 5/2) fine sand, some silt, trace clay.
		C		Hit clay layer.
		SS#2		SI: 9-10.5' BLS RE: 1.5'
			4	0.3' - Brownish gray (7.5YR 5/2) silt, some clay.
10			5	1.2' - Dark gray brown (7.5YR 5/0) clay, some silt,

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	8	some pebbles.
		C		Light gray sand, moist.
		SS#3		SI: 14-15.5' BLS RE: 1.0'
			3	0.8' - Light gray (7.5YR 7/1) sand, some silt.
			4	0.2' - Interbedded light gray silt and light brown
15			5	sand, wet.
		C		Light gray sand, some silt, trace clay, moist.
		C		Brownish gray sand.
		SS#4		SI: 19-20.5' BLS RE: 1.2'
			2	0.5' - Brown (10YR 6/6) sand, some silt, trace clay.
			3	0.7' - Light gray (7.5YR 7/0) coarse sand, trace silt.
20			3	
		C		Light brownish gray sand, trace silt, wet.
		SS		Upon lowering split spoon sampler, discovered over 2.0' of
				heave (rock debris) lodged inside auger, determined sample
25				recovery would be impossible.

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DRILLING LOG

MW- 13 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25				
		C		Light grayish brown, coarse sand.
		SS#5		SI: 29-30.5' BLS RE: 0.9'
			6	0.3' - Light gray (5YR 7/1) sand, trace silt.
			8	0.6' - Light gray (10YR 6/1) coarse sand, with
30			13	disseminated very fine black grains.
		C		Light brown to light grayish brown, coarse sand.
		SS#6		SI: 34-35.5' BLS RE: 0.0'
			6	Attempted split spoon sample, no recovery, considered
			5	interval to be composed of clean sand.
35			7	
		C		Light grayish brown sand.
		SS#7		SI: 39-40.5' BLS RE: 0.0'
			5	Attempted split spoon sample, no recovery, considered
40			6	interval to be composed of clean sand.

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DRILLING LOG

MW- 13 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#7	10	
		C		Light grayish brown sand.
		SS#8		SI: 44-45.5' BLS RE: 0.3'
			4	0.3' - Light brown to tan, coarse sand and cobbles.
45			4	
			7	
		SS		Upon lowering split spoon sampler discovered over 2.0' of
				heave in augers, decided sample recovery would be impossible.
50				
		C		Brown, coarse sand and pebbles.
		SS#9		SI: 54-55.5' BLS RE: 0.0'
			12	Attempted split spoon sample, no recovery, considered
55			18	interval to be composed of clean sand.

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#9	19	
		C		Tan to brown sand.
		SS#10		SI: 59-60.5' BLS RE: 0.2'
			13	0.2' - Medium to dark brown (10YR 5/4) cobbles and
60			13	coarse sand
			19	
				Drilling rate changed at approximately 61.5' BLS, probably
				hit clay layer.
		C		Brown sand with some dark gray clay.
		SS#11		SI: 63-64.5' BLS RE: 0.7'
			9	0.7' - Dark gray (5Y 4/1) clay, silty, dense.
			11	finely laminated.
			14	
65				
70				

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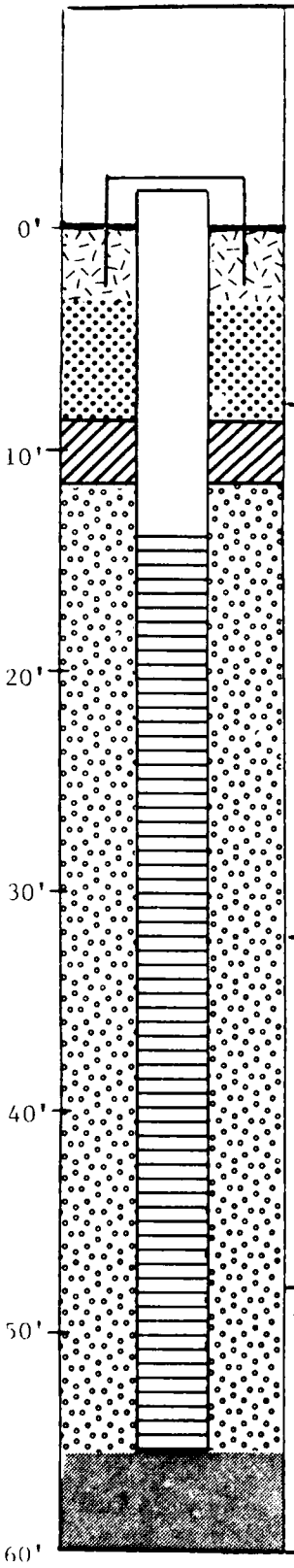
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW- 14



Drilling Summary:

Total Depth: 56' Drillers: Calvin Wallace
Borehole Diameter(s): 8" Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 19.12' Bit(s): Drag
Top of Casing: 21.16' Drilling Fluid Type: Water
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 4 pp. 106-115 Water Level: 15.2' 11/14/84

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2" ID 2 3/8" OD Diameter: 2"
Length: 15' Slot: 0.010; 5/inch
Filter: Material: 40 Sand Setting: 13-56'
Setting: 11-56' Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 9-11'
Setting: LS-9.0' Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	11/1/84	0800 hrs	11/1/84	1145 hrs
Installation:	11/1/84	1250 hrs	11/1/84	1509 hrs
Water Level Reading:			11/14/84	1532 hrs
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10gpm for minimum 2 hours and until clear.

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DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW- 14

Site Sketch

Location: Fire Training Area #1
Reference Point: Land Surface
Reference Point Elevation:

Field Book No.: 4 pp 106-115
Log By: Rick Eades
Driller: Calvin Wallace
Rig Type: Failing 1250 Hydraulic Rotary
Total Depth: 56'

	Date	Time
Drilling Started:	11/1/84	0800hrs
Drilling Completed:	11/1/84	1145
Water Level: 15.2'	11/14/84	1532

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" 30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Brown medium to coarse sand, some silt, some pebbles.
5		SS#1		SI: 5-7' BLS RE: 0.9'
			13	0.4' - Light gray (5YR 7/1) cobbles, some coarse sand,
			28	trace silt.
			31	0.5' - White medium sand.
			34	
		C		Light brown medium sand, some fine sand, trace silt.

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DRILLING LOG

MW- 14 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	9	SI: 10-12' BLS RE: 0.0'
			9	Attempted split spoon sample, no recovery, considered
			7	interval to be composed of clean sand.
			11	
		C		Tan to light brown, very coarse sand, some pebbles.
		SS#3		SI: 15-17' BLS RE: 0.5'
15			8	0.5' - Light gray (5YR 7/1) medium sand, some fine sand,
			3	trace silt.
			3	
			4	
		C		Tan cobbles, very coarse sand.
		SS#4		SI: 20-22' BLS RE: 0.5'
20			6	0.5' - Gray brown to tan (7.5YR 7/2) coarse sand,
			5	cobbly, trace fine sand.
			9	
			16	
		C		Light gray brown pebbles, some cobbles.
25				

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DRILLING LOG

MW- 14 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	7	SI: 25-27' BLS RE: 0.0'
			10	Attempted split spoon sample, no recovery, considered
			12	interval to be composed of clean sand.
			15	
		C		Tan to white, coarse sand, some pebbles
		SS#6		SI: 30-32' BLS RE: 0.0'
30			14	Attempted split spoon sample, no recovery, considered
			17	interval to be composed of clean sand.
			19	
			25	
		C		Light gravish brown cobbles, some pebbles.
		SS#7		SI: 35-37' BLS RE: 0.0'
35			10	Attempted split spoon sample, no recovery, considered
			11	interval to be composed of clean sand.
			12	
			22	
		C		White to brown cobbles.
40				

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DRILLING LOG

MW- 14 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	22	SI: 40-42' BLS RE: 0.5'
			28	0.5' - Medium to dark orange brown (10YR 6/8), very
			24	coarse sand, some cobbles, trace fine sand.
			33	
		C		Medium orange brown, coarse sand, some pebbles.
		SS#9		SI: 45-47' BLS RE: 0.5'
45			16	0.5' - Dark reddish brown (10YR 5/6) coarse sand,
			17	some pebbles, trace silt, trace clay.
			23	
			30	
		C		Orange brown pebbles and coarse sand.
		SS#10		SI: 50-51' BLS RE: 0.4'
50			51	0.4' - Yellowish brown (10YR 6/8) coarse sand,
			200	trace fine sand, trace cobbles.
				Note: Only sampled 1.0' interval because cobble became
				lodged in sampler.
		C		Pebbles and coarse sand, trace silt, trace clay.
55				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	100	SI: 55-55.6' BLS RE: 0.2'
			100*	0.2' - Dark orange brown (10YR 5/6) coarse sand, trace fine sand.
				*Note: Cobble lodged in sampler and rejected sampler at 55.6'.
		C		Coarse sand with very dark gray clay at 57.0'
				Drilling rate changed at approximately 56' BLS, probably hit top of the clay layer.
		SS#12		SI: 60-62' BLS RE: 2.0'
60			18	2.0' - Dark gray (5Y 4/1) clay, silty, dense,
			14	finely laminated.
			27	
65				
70				

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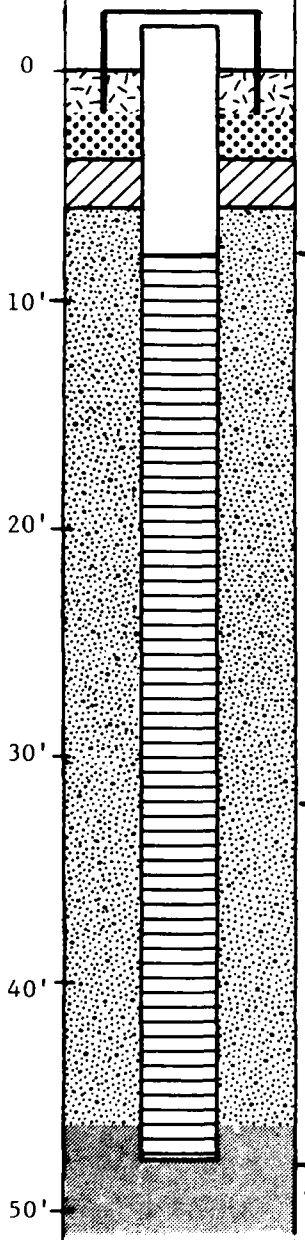
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW- 15



Drilling Summary:

Total Depth: 48' BLS
Drillers: Gary Truver (Walton Drilling)
Borehole Diameter(s): 6"
Rig Type: CME-55 : Auger
Elevation: Land Surface: 9.21'
Bit(s): Auger
Top of Casing: 11.11'
Drilling Fluid Type: Water
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 2 pp. 30-42
Water Level: 6.7' BLS 11/2/83

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2" ID 2 1/4"OD
Diameter: 2"
Length: 10'
Slot: 0.010; 5/inch
Filter: Material: Formation/4Q Sand
Setting: 8-48' BLS
Setting: 6.3-48' BLS/5.9-6.3' BLS
Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben
Setting: 3.9'-5.9' BLS
Setting: 2.5'-3.9' BLS
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	11/2/84	1312 hrs	11/5/84	1432 hrs
Installation:	11/5/84	1446 hrs	11/5/84	1648 hrs
Water Level Reading:	6.7' BLS	1344 hrs	11/8/84	4.92' BLS
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10gpm for minimum 2 hours and until clear.

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DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-15

Site Sketch

Location: Fire Training Area #1
Field Book No.: 2 pp 30-42
Log By: Andris Lapins
Driller: Gary Fruver (Walton)
Rig Type: CME-55 : Auger
Reference Point: Land Surface
Total Depth: 48' BLS
Reference Point Elevation: 9.21'

	Date	Time
Drilling Started:	11/2/84	1312 hrs
Drilling Completed:	11/5/84	1432

Water Level: 6.7' BLS 11/2/84

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				Legend: SI: Sampling Interval; RE: Recovery; SS: Split Spoon; C: Cuttings. Gradation: Trace 1-12%; Little 12-20%; Some 20-30%; Add "Y" >30%
0				
		C		Light brown fine sand and silt. Heavy gravel layer at @ 3' BLS.
		SS#1		SI: 4-6' BLS RE: 1.6
			8	1.6' - White to pale yellow (5Y 8/2-8/3) medium to
5			7	coarse sand, some silt, trace clay, trace heavy
			8	gravel (rounded pebbles at top of sample); poorly
			8	sorted; reworked "urban" soils; moist; lower half
				of sample wet.
				Cuttings saturated at ≈ 8' BLS.
		SS#2		SI: 9-11' BLS RE: 1.8'
			1	1.8' - White (5Y 8/2) fine sand, some silt, trace clay
10			1	and gravel; few pebbles; emerald green specs

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DRILLING LOG

MW - 15 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	1	(mineral) throughout; loose; saturated.
			3	
				Water level in auger 6.7' BLS.
		SS#3		SI: 14-16' BLS RE: 1.7'
			2	1.7' - Same as above
			1	
15			1	
			2	
		SS#4		SI: 19-21' BLS RE: 1.0'
			3	0.8' - Same as above
			3	0.4' - Pale yellow (2.5Y 8/4) coarse sand and light gravel,
20			5	some silt, trace clay; poorly sorted; loose; wet.
			6	
		SS#5		SI: 24-26' BLS RE: 0.8'
			5	0.8' - Same as above with few large rounded pebbles
25			3	near top.

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DRILLING LOG

MW - 15 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	4	
			5	
		SS#6		SI: 29-31' BLS RE: 0.4'
			9	0.4' - Strong brown (7.5YR 5/8) medium to coarse sand and
			9	gravel, some silt, trace clay; poorly sorted; wet.
30			11	
			11	
		SS#7		SI: 34-36' BLS RE: 0.8'
			10	0.2' - Same as above
			9	0.4' - Pinkish white (7.5YR 8/2 medium to coarse sand,
35			9	some gravel and silt, trace clay; poorly sorted; wet.
			22	0.2' - Same as 0.2' above with several large rounded quartz
				pebbles
		SS#8		SI: 39-41' BLS RE: 1.3'
			23	1.3' - Reddish yellow (7.5YR 6/8) fine sand, some silt;
40			33	gravel stringer at top, bottom and middle; wet.

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DRILLING LOG

MW- 15 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	50	
			110/4"	
				Water level in auger 8.1' BLS.
		SS#9		SI: 44-46' BLS RE: None
			7	Sands heaved/filled in auger @ 4'. Unable to flush out
			9	and obtain clean sample.
45			13	
			10	Note: Estimated depth to top of Kirkwood Fm. - 45' BLS.
		SS#10		SI: 49-51' BLS RE: 1.0'
			3	1.0' - Very dark gray to black silty clay, trace very fine
			4	sand; light gray very fine sand and silt laminations;
50			5	firm; dense.
			6	
				Last auger flight (5') covered with Kirkwood clay. See
				note above.
55				

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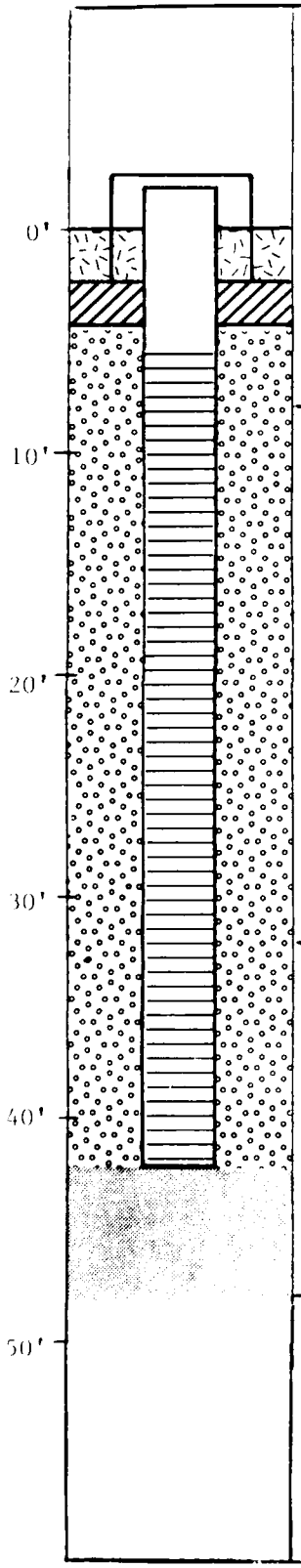
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW- 16



Drilling Summary:

Total Depth: 42.5' Drillers: Calvin Wallace
Borehole Diameter(s): 8" Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 8.49 Bits: Drag
Top of Casing: 10.57' Drilling Fluid Type: Water
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 5 pp. 2-8 Water Level: 6.5' BLS 11/14/84

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2" ID 2 3/8" OD Diameter: "
Length: 8' Slot: 0.010; 5/4 gh
Filter: Material: 4Q Sand Setting: 6-42.5'
Setting: 4-42.5' Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 2-4'
Setting: LS-4.0' Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started	Completed
Drilling:	11/5/84 0935 hrs	11/5/84 1325 hrs
Installation:	11/5/84 1330 hrs	11/5/84 1515 hrs
Water Level Reading:		11/14/84 1620 hrs
Development:		

Well Development:

Method/Equipment: Air blown for 8 hours, purged at least for minimum 2 hours and until clear.

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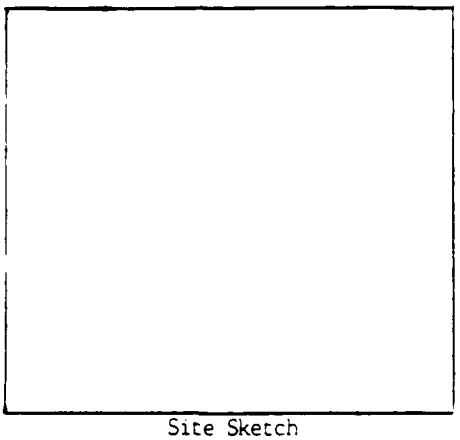
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW- 16



Site Sketch

Location: Fire Training Area #1
Field Book No.: 5 PP 2-8
Log By: Rick Eades
Driller: Calvin Wallace
Rig Type: Failing 1250 Hydraulic Rotary
Reference Point: Land Surface
Total Depth: 42.5
Reference Point Elevation: 8.49'

	Date	Time
Drilling Started:	11/5/84	0935hr
Drilling Completed:	11/5/84	1325
Water Level: 6.5'	11/14/84	1620

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Light brown, cobbles, some sand, trace silt, trace clay.
5		SS#1		SI: 5-7' BLS RE: 0.6'
			5	0.6' - Light brown to whitish brown (10YR 7/3) coarse
			5	sand, cobbly, trace silt, trace clay.
			4	
			6	
		C		Light brown, coarse sand, cobbly, trace silt, trace clay.
10				

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DRILLING LOG

MW- 16 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	8	SI: 10-12' BLS RE: 0.0'
			8	Attempted split spoon sample, no recovery, considered
			7	interval to be composed of clean sand.
			11	
		C		Light brown, coarse to medium sand, trace silt, trace pebbles.
		SS#3		SI: 15-17' BLS RE: 0.0'
15			6	Attempted split spoon sample, no recovery, considered
			6	interval to be composed of clean sand.
			9	
			13	
		C		Light yellowish brown, coarse to medium sand.
		SS#4		SI: 20-22' RE: 0.0'
20			10	Attempted split spoon sample, no recovery, considered
			5	interval to be composed of clean sand.
			10	
			15	
		C		Light to medium brown, coarse sand, some pebbles.
25				

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DRILLING LOG

MW- 16 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	16	SI: 25-27' BLS RE: 1.5'
			18	1.5' - Yellowish brown (10YR 5/8) coarse to medium sand,
			20	trace silt, trace pebbles.
			31	
		C		Yellowish brown coarse sand.
30		SS#6		SI: 30-32' BLS RE: 0.0'
			18	Attempted split spoon sample, no recovery, considered
			21	interval to be composed of clean sand.
			20	
			23	
		C		Yellowish brown, coarse sand and pebbles.
35		SS#7		SI: 35-37' BLS RE: 0.0'
			21	Attempted split spoon sample, no recovery, considered
			19	interval to be composed of clean sand.
			17	
			18	
		C		Yellowish brown, coarse sand and pebbles.
40				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	44	SI: 40-41' BLS RE: 0.6'
			100	0.6' - Dark brown (7.5YR 5/8) coarse to medium
				sand, cobbly
				Note: Only penetrated 1.0' since cobble became lodged
				in sampler.
				Driller indicated contact with clay layer at 42.5' BLS
		C		Light brown, coarse to medium sand and dark gray clay.
45		SS#9		SI: 45-47' BLS RE: 2.0'
			8	2.0' - Dark gray (5Y 4/1) clay, silty, dense.
			14	finely laminated.
			23	
			32	
50				
55				

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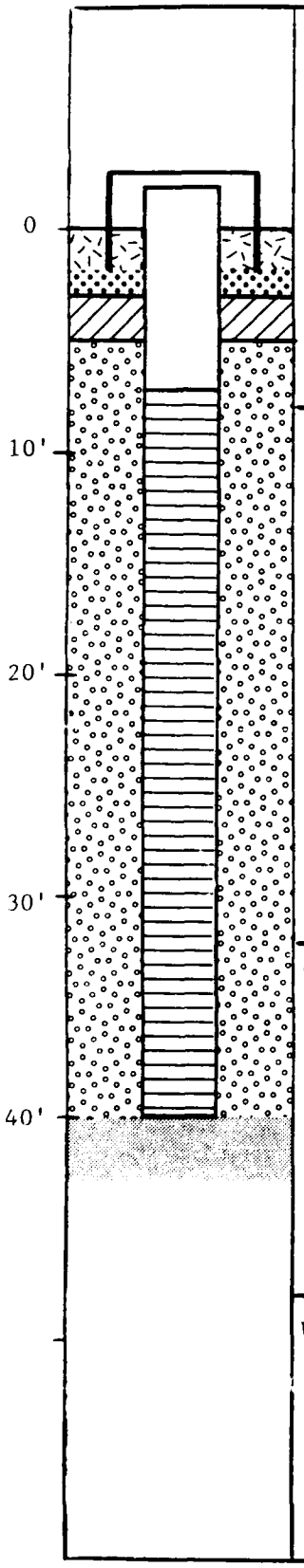
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW - 17



Drilling Summary:

Total Depth: 40' BLS Drillers: Calvin Wallace
Borehole Diameter(s): 6½" Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 8.4' Bit(s): Drag
Top of Casing: 10.27' Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Andris Lapins Amount Used:
Log Book No. 3 pp. 29-37 Water Level: 5.2' BLS 1/9/85

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2" ID 2 1/4"OD Diameter: 2"
Length: 9' Slot: 0.010; 5/inch
Filter: Material: 4Q Sand Setting: 7-40' BLS
Setting: 4.9-40' BLS Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 3-4.9' BLS
Setting: 2-3' BLS Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	11/13/84	1030 hrs	11/13/84	1357 hrs
Installation:	11/13/84	1412 hrs	11/13/84	1505 hrs
Water Level Reading:			1/9/85	5.2' BLS
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10 gpm for minimum 2 hours and until clear.

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DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW- 17

Site Sketch

Location: Fire Training Area #1
Field Book No.: 3 pp 29-37
Log By: Andris Lapins
Driller: Calvin Wallace (Delmarva)
Rig Type: Failing 1250 Hydraulic Rotary
Reference Point: Land Surface
Total Depth: 40' BLS
Reference Point Elevation: 8.4'

	Date	Time
Drilling Started:	11/13/84	1030 hrs
Drilling Completed:	11/13/84	1505
Water Level:	5.2' BLS	1/9/85

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		SS#1		SI: 5-7' BLS RE: 0.9'
5			7	0.7'- Pale yellow to white fine sand, some silt; emerald
			7	green spots in sand-mineral; loose; wet.
			5	0.2'- Reddish yellow fine sand, some silt; loose; wet.
			8	
10				

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DRILLING LOG

MW - 17 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	11	SI: 10-12' BLS RE: 1.5'
			14	0.4' - Reddish yellow fine silty sand; few small iron
			14	concretions at top and bottom; wet.
			13	0.2' - White very fine to fine sand, some silt; wet.
				0.6' - Dark brown silty very fine sand; large iron
				concreations at top and bottom; wet.
				0.3' - Pale yellow fine sand, some silt; wet.
		SS#3		SI: 15-17' BLS RE: 0.8'
15			8	0.8' - Yellow medium to coarse sand, some silt, trace
			8	gravel; loose; wet.
			9	
			16	
		SS#4		SI: 20-22' BLS RE: 0.3'
20			10	0.3' - Same as above
			12	
			13	
			13	
				Formation taking on water; drilling mud thickened.
25				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	16	SI: 25-27' BLS RE: 0.5'
			38	0.5' - Reddish yellow medium to coarse sand, some silt
			31	and light gravel, trace clay; few rounded quartz
			42	pebbles; poorly sorted; wet.
		SS#6		SI: 30-32' BLS RE: 0.3'
30			21	0.3' - Same as above. Much heavy gravel (wash material in
			40	bottom of hole) inhibiting sample collection and
			46	recovery.
			76	
		SS#7		SI: 35-37' BLS RE: 0.4'
35			11	0.4' - Same as above
			18	
			22	
			31	
40				

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DRILLING LOG

MW - 17 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	20	SI: 40-42' BLS RE: 1.1'
			11	0.3' - Pale yellow clay, few rounded quartz pebbles;
			15	soft; wet.
			19	0.25' - Dark brown fine sand, some silt, few pebbles
				and iron concretions; wet.
				0.55' - Very dark gray silty clay, trace very fine sand;
				light gray silt and very fine sand laminations
				throughout. Upper portion contains iron concretions
				and is iron stained; stiff; dense.
45				
50				
55				

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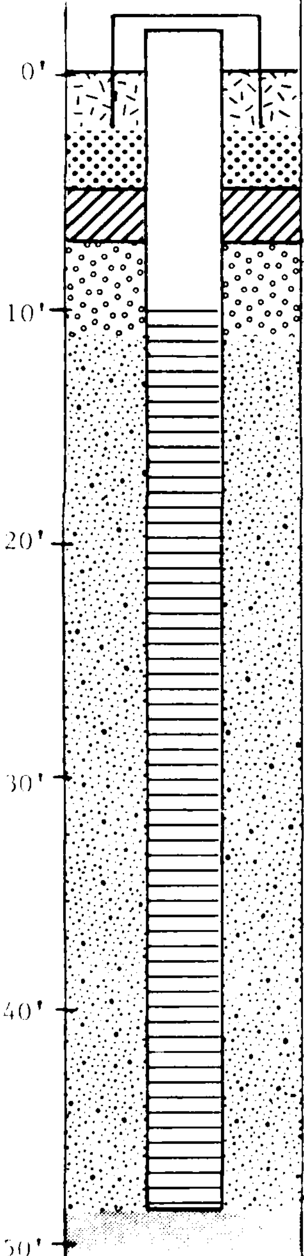
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-18



Drilling Summary:

Total Depth: 48.5'
Drillers: [illegible]
Borehole Diameter's: 6"
Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 18.13'
Bits: Hollow stem auger
Top of Casing: 19.73'
Drilling Fluid Type: None
Supervisory Geologist: Richard Eades
Amount Use:
Log Book No. 4 pp. 23-49
Water Level: 11' BLS 10/24/84

Well Design:

Casing: Material: Schedule 40 PVC
Screen: Material: Schedule 40 PVC
Diameter: 2" ID 2 3/8"OD
Diameter: 2"
Length: 12.5'
Slot: 0.010; 5 slots/inch
Filter: Material: 4Q Sand
Setting: 10.5-48.5'
Setting: 7.0-11.0'
Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben
Setting: 5.0-7.0'
Setting: LS-5.0'
Surface Casing: Steel [illegible]
Other: Formation allowed to cave, providing natural sand pack from 11.0' - 48.5'. Protective steel casing cemented into land surface.

Time Log:

	Started		Completed	
Drilling:	10/23/84	0935 hrs	10/2[illegible]/8[illegible]	1500 hrs
Installation:	10/24/84	1500 hrs	10/2[illegible]/8[illegible]	1530 hrs
Water Level Reading:			10/2[illegible]/8[illegible], 1100 hrs (11')	
Development:				

Well Development:

Method/Equipment: Air blown and pumped [illegible] at 10gpm for minimum [illegible] hour [illegible] until [illegible].

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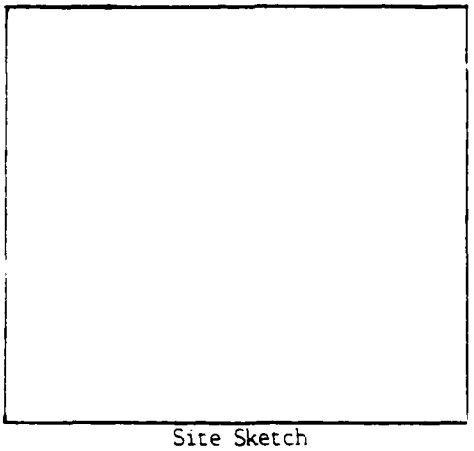
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW- 18



Site Sketch

Location: Fire Training Area #3
Field Book No.: 4 pp 23-49
Log By: Rick Eades
Driller: Gary Truver
Rig Type: CME Auger
Reference Point: Land Surface
Total Depth: 48.5'
Reference Point Elevation: 18.13'

	Date	Time
Drilling Started:	10/23/84	0934hr
Drilling Completed:	10/24/84	1500
Water Level: 11'	10/24/84	1100

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" 30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Light grayish brown clay with some silt.
		SS#1		SI: 4-5.5' BLS RE: 1.5'
			6	1.5' - Grayish brown (5YR 5/1) clay, some silt, trace
5			7	sand; thin orange streaks near bottom of sample.
			6	
		C		Light reddish brown sand, some silt, trace clay.
		SS#2		SI: 9-10.5' BLS RE: 1.4'
			3	0.3' - Brown medium sand
10			4	0.5' - Grayish brown medium sand, some silt

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DRILLING LOG

MW- 18 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	5	0.6' - Light to brownish gray medium to fine sand, some silt
		C		Light gray sand, some silt.
		SS#3		SI: 14-15.5' RE: 1.2'
			1	1.2' - Light gray fine to medium sand, some silt trace
			1	clay, some quartz pebbles; interbeds of reddish
15			3	orange sand. Sample moist.
		C		Light gray sand, some silt.
		SS#4		SI: 19-20.5' BLS RE: 0.8'
			5	0.8' - Light gray brown (10YR 8/3) coarse sand and semi-
			5	rounded quartz pebbles. Sample moist.
20			7	
		C		Tan, coarse to very coarse sand.
		C		Coarse sand, some clay.
		SS#5		SI: 24-25.5' BLS RE: 0.6'
			7	0.2' - Light gray (5YR 5/1) coarse sand.
25			6	0.1' - Orange to reddish brown clay.

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DRILLING LOG

MW- 18 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	9	0.3' - Interbedded orange brown clay and silt. Sample wet.
		C		Gravel layer, approximately 0.5-1.0' thick.
		SS#6		SI: 29-30.5' BLS RE: 1.2'
			7	0.9' - Orange to reddish brown (7.5YR 5/8) medium to
			7	coarse sand, trace clay.
30			16	0.3' - Reddish brown sand, some silt.
		C		Grayish brown sand.
		SS#7		SI: 34-35.0' BLS RE: 0.6'
			22	0.6' - Medium to dark reddish brown (5YR 4/6) medium
			27	to fine sand, trace silt.
35			31	
		C		Reddish brown sand.
		SS#8		SI: 39-40.5' BLS RE: 0.0'
				Attempted split spoon sample, no recovery in sample tube,
40				considered interval to be composed of clean sand.

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DRILLING LOG

MW- 18 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40				
		C		Reddish brown, coarse sand.
		SS#9		SI: 44-45.5' BLS RE: 1.2'
			19	1.2' - Brown to yellowish brown, medium to fine sand.
			25	Some silt.
45			22	
				Driller indicated change in lithology at 46' BLS,
				probably top of the clay layer.
		SS#10		SI: 49-50.5' BLS RE: 1.0'
			2	1.0' - Dark gray (5Y 4/1), finely laminated, dense,
			4	well compacted clay, silty.
50			5	
55				

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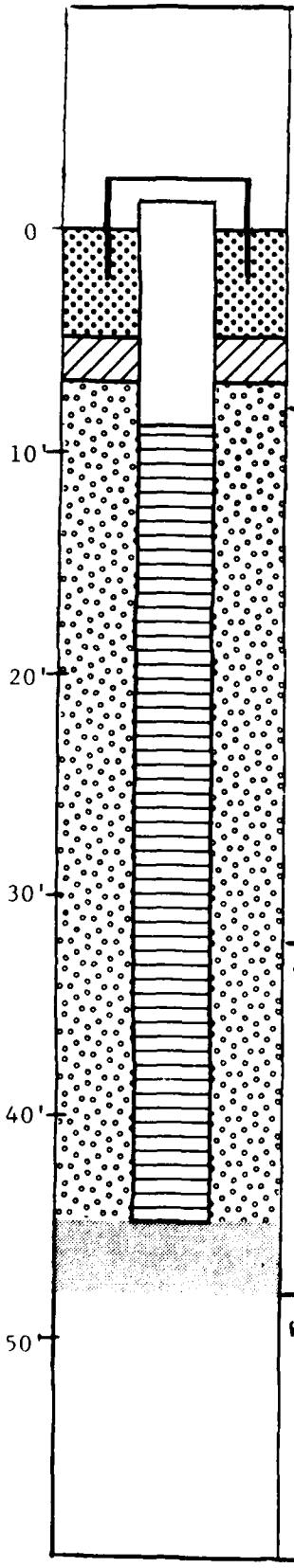
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW - 19



Drilling Summary:

Total Depth: 44' BLS
Drillers: Calvin Wallace
Borehole Diameter(s): 6 1/2"
Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 14.42'
Bit(s): Drag
Top of Casing: 16.27'
Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 1 pp. 1-17
Water Level: 7.8' BLS 10/25/84

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2" ID 2 1/4" OD
Diameter: 2"
Length: 11'
Slot: 0.010; 5/inch
Filter: Material: 40 sand
Setting: 9'-44' BLS
Setting: 7'-44' BLS
Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben
Setting: 4.8'-7' BLS
Setting: 3'-7' BLS
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	10/23/84	1117 hrs.	10/23/84	1827 hrs
Installation:	10/23/84	1850 hrs	10/24/84	0912 hrs
Water Level Reading:			7.8' BLS	10/25/84
Development :				

Well Development:

Method/Equipment: Air blown and surged for 2 hours, pumped at 10gpm for 2 hours and until clear.

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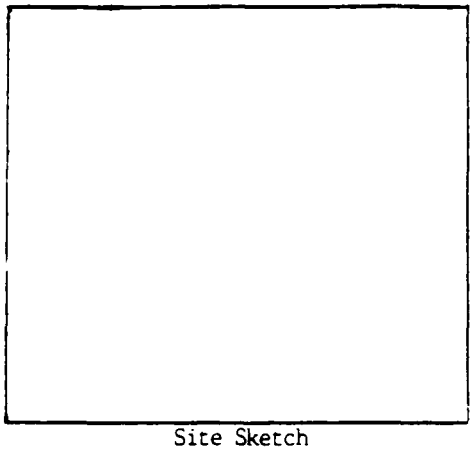
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW - 19



Site Sketch

Location: Fire Training Area #3
Field Book No.: 1 pp 1-17
Log By: Andris Lapins
Driller: Calvin Wallace (Delmarva)
Rig Type: Failing 1250 Hydraulic Rotary
Reference Point: Land Surface
Total Depth: 44' BLS
Reference Point Elevation: 14.42'

	Date	Time
Drilling Started:	10/23/84	1117 hrs
Drilling Completed	10/24/84	0912
Water Level: 7.8' BLS	10/25/84	0820

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Light brown to gray fine to coarse sand, some silt and clay, little gravel; poorly sorted; few rounded subangular quartz pebbles.
		SS#1		SI: 5.0-7.0' BLS RE: 1.0'
5			5	0.6' - Brownish gray fine sand, some silt, trace clay and gravel; few sub-angular quartz pebbles.
			6	
			5	0.4' - Gray clay, litle fine sand, trace silt; soft; plastic.
			5	
		C		Gray clay, fine sand, silt. Black clay appears in cuttings at @ 8-9' BLS
10				

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DRILLING LOG

MW- 19 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	3	SI: 10-12' BLS RE: 2.0'
			3	1.7' - Dark black clay - sooty in appearance, trace very
			5	fine sand; much organic matter - dark brown grass
			7	blades and stems.
				0.3' - Gray clay, some medium to coarse sand; some dark brown
				organic matter; small shred of polyethylene plastic;
				reddish yellow mottling.
15		SS#3		SI: 15-17' BLS RE: 1.3'
			17	0.3' - Gray clay, trace very fine sand, few subangular
			15	pebbles; large piece of wood cut by sampler
			8	(@ 0.15' diam.).
			15	0.25' - Pale yellow (5Y7/3) very fine sand, trace clay,
				saturated.
				0.75' - Pale yellow gravelly very fine sand grading to
				gravelly coarse sand, poorly sorted, loose. Gravel
				approx. 0.05' in diameter.
20		SS#4		SI: 20-22' BLS RE: 0.8'
			20	0.8' - Reddish yellow fine to coarse sand, trace silt.
			28	
			53	
			75	
25				

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DRILLING LOG

MW - 19 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	19	SI: 25-27' BLS RE: 0.75'
			63	0.75' - Reddish yellow (7.5YR) 6/8) gravelly medium to
			88	Coarse sand; poorly sorted; loose.
			91	
30		SS#6		SI: 30-32' BLS RE: 0.6'
			35	0.6' - Yellow (10YR 7/8) fine sand.
			45	
			150	
			100(3')	
35		SS#7		SI: 35-37' BLS RE: 0.5'
			18	0.5' - Yellow (2.5Y 7/6) fine sand.
			30	
			42	
			90	
40				

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DRILLING LOG

MW- 19 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	10	SI: 40-42' BLS RE: 0.6'
			57	0.6' - Yellow (2.5Y 7/6) fine sand, some gravel.
			250	
			220	
				Note: Driller indicates a change in lithology at
				@ 44' BLS - top of clay layer.
45		SS#9		SI: 45-47; BLS RE: 1.2'
			7	1.2' - Very dark olive gray silty clay, trace very fine
			10	sand; stiff; dense; dry to moist. Light gray very
			18	fine sand and silt laminations throughout.
			80(3")	
50				
55				

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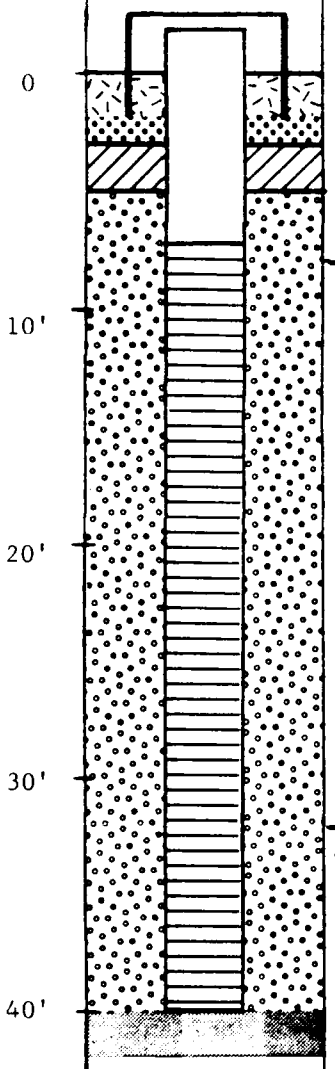
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW- 20



Drilling Summary:

Total Depth: 40' BLS
Borehole Diameter(s): 6¼"
Drillers: Calvin Wallace
Delmarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: 10.39'
Bit(s): Drag
Top of Casing: 12.34'
Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 1 pp. 17-31
Water Level: 4.15' BLS 1/9/85

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2" ID 2 1/4" OD
Diameter: 2"
Length: 9'
Slot: 0.010; 5/inch
Filter: Material: 40 Sand
Setting: 7'-40' BLS
Setting: 4.8'-40 BLS
Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben
Setting: 2.5'-4.8' BLS
Setting:
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	10/24/84	1253 hrs	10/24/84	1628 hrs
Installation:	10/25/84	0934 hrs	10/25/84	1044 hrs
Water Level Reading:			1/9/85	4.15' BLS
Development :				

Well Development:

Method/Equipment: Air blown for 5 hours, surged at least
for minimum 2 hour and until clear.

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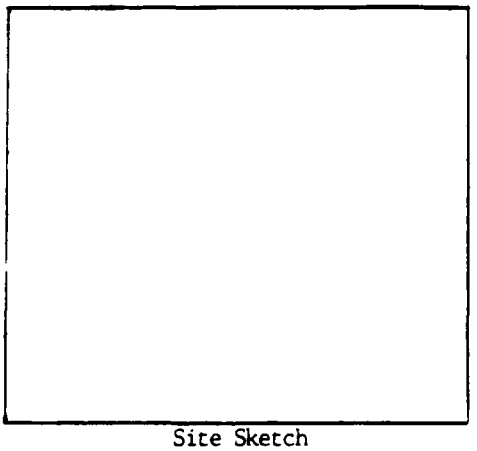
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW - 20



Site Sketch

Location: Fire Training Area #3
Reference Point: Land Surface
Reference Point Elevation: 10.39'

Field Book No.: 1 pp 17-31
Log By: Andris Lapins
Driller: Calvin Wallace (Delmarva)
Rig Type: Failing 1250 Hydraulic Rotary
Total Depth: 40' BLS

	Date	Time
Drilling Started:	10/24/84	1253
Drilling Completed:	10/25/84	1044
Water Level: 4.15' BLS	1/9/85	

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" >30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Silty fine sand and black clay.
5		SS#1		SI: 5-7' BLS RE: 1.5'
			6	0.5' - Gray to olive grav clay, some medium sand, little
			10	fine gravel; reddish brown mottling; soft to firm.
			18	0.5' - Medium to coarse gray sand; yellow to reddish brown
			14	mottling.
				0.5' - Gray clay, some medium sand, little gravel; reddish
				brown mottling; soft to firm.
10				

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DRILLING LOG

MW- 20 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	12	SI: 10-12' BLS RE: 1.41'
			37	0.2' - Gray clay; yellowish brown mottling.
			94	0.1' - Dark brown organic layer with wood chips.
			92	0.5' - Gray Medium to coarse sand; black organic rich laminations; few large pebbles.
				0.6' - Yellow to buff medium sand grading to gray medium sand and gravel; gravel mixed, poorly sorted.
15		SS#3		SI: 15-17' BLS RE: 0.8'
			13	0.8' - Yellow (10YR 7/6) fine to medium sand, trace silt.
			13	
			15	
			17	
20		SS#4		SI: 20-22' BLS RE: 0.8'
			9	0.2' - Brownish yellow (10YR 6/8) fine sand, trace silt.
			12	0.25' - Brownish yellow (10YR 6/6) clay, trace sand.
			13	0.35' - Brownish yellow medium sand and gravel, trace silt.
			36	
25				

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DRILLING LOG

MW - 20 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	9	SI: 25-27' BLS RE: 0.6'
			8	0.6' - Brownish yellow fine to medium sand, little light
			16	gravel, trace silt.
			22	
		SS#6		SI: 30-32' BLS RE: None
30			17	Second attempt for sample at this depth results in 4 inches
			23	of penetration after more than 200 blows with no recovery.
			23	Much heavy gravel accumulated in bottom of hole. Hole
			40	advanced to 31' BLS and flushed heavily. Third attempt for
				sample resulted in no recovery. Cuttings: Brownish yellow
				coarse sand, little gravel.
		SS#7		SI: 35-37' BLS RE: 0.8'
35			11	0.8' - Yellowish red (5YR 5/8) fine to coarse sand, little
			17	gravel, trace silt; poorly sorted. Large iron
			25	concretion in cave material at top of sample.
			32	
				Rig shimmy at @ 38-39' BLS from iron concretions or heavy
				gravel.
40				

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DRILLING LOG

MW - 20 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	7	SI: 40-42' BLS RE: 2.0'
			7	2.0' - Very dark olive gray silty clay, trace very fine
			13	sand; stiff; dense. Light gray very fine sand
			15	and silt laminations.
45				
50				
55				

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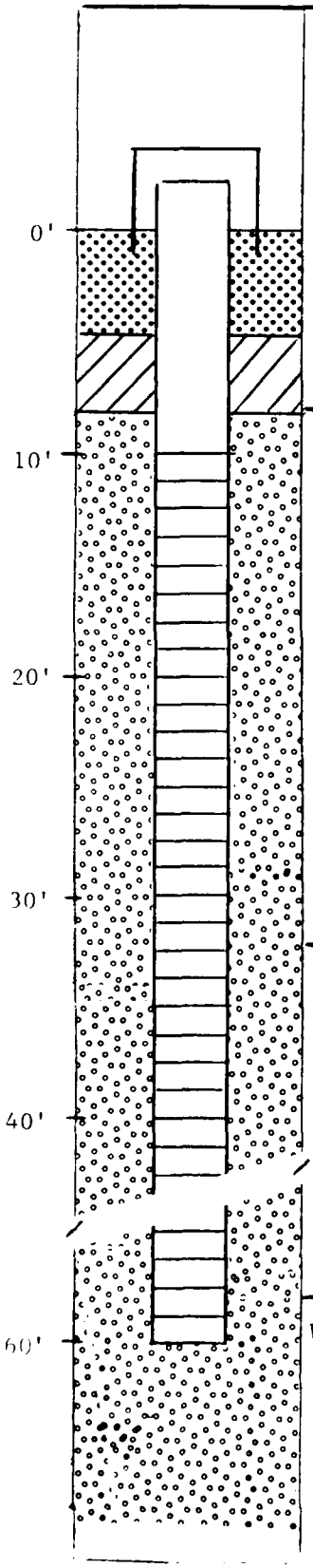
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW- 21



Drilling Summary:

Total Depth: Drilled to 66.5' BLS
Borehole Diameter(s): 6.5"
Elevation: Land Surface:
Top of Casing: 18.03'
Supervisory Geologist: Ed Tokarski
Log Book No. 2 pp. 1-5

Drillers: Gary Truver
Delamarva Drilling
Rig Type: Failing 1250 Hydraulic Rotary
Bit(s): Drag
Drilling Fluid Type: Water/Bentonite
Amount Use:
Water Level: 8.73' BLS 11/19/84; 1400

Well Design:

Casing: Material: PVC
Diameter: 2.0" ID 2.25" OD
Length: 12'
Filter: Material: 4Q sand
Setting: 8.16' - 67'
Grout: Type: #1 Portland Cement/Ben
Setting: 2.0' - 8.16'

Screen: Material: PVC
Diameter: 2"
Slot: 0.01 10 Slot/Inch
Setting: 10' - 60'
Seals: Type: Bentonite Pellets
Setting: 5.66' - 8.16'
Surface Casing: Steel/PVC
Other: Protective steel casing cemented into land surface.

Time Log:

	Started	Completed
Drilling:	10/29/84 0930	10/29/84 1430
Installation:	10/29/84 1430	10/29/84 1600
Water Level Reading:	8.73' BLS	11/19/84 1400
Development :		

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10gpm for minimum 2 hours and until clear.

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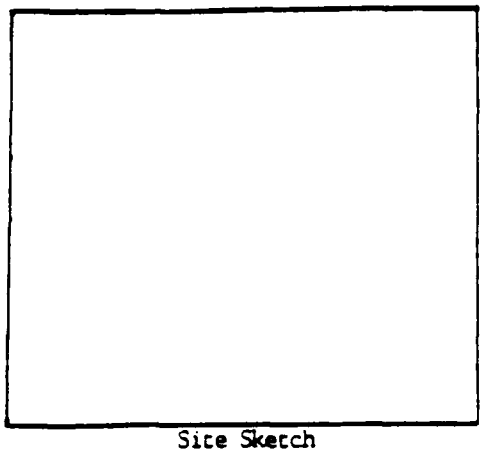
DRILLING LOG

Project: Dover AFB **Owner:** US Air Force **Well No.:** MW- 21



Site Sketch

Location: Downgradient
App. 20 ft. East
Site #D-5

Reference Point: Land Surface

Reference Point Elevation:

Field Book No.: 2 pp 1-5
Log By: Ed Tokarski
Driller: Calvin Wallace (Delmarva)
Rig Type: Failing 1250 Hydraulic Rotary
Total Depth: Drilled to 65' BLS
Well to 60' BLS

	Date	Time
Drilling Started:	10/29/84	0930
Drilling Completed:	10/29/84	1600
Water Level:	11/19/84	1400

8.73' BLS

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	LEGEND / DESCRIPTION / GRADATION
0'				LEGEND SI = Sample Interval RE = Recovery SS = Split Spoon C = Cuttings GRADATION Trace = 1-12% Little = 12-20% Some = 20-30%
2'				
4'				
				SI: 5.0 - 7.0' BLS RE: 1.25'
6'		SS#1	6 11 19 21	0.0' - 0.25' Brown sand with some gravel. 0.25'- 0.42' Gray silty clay with trace sand. 0.42'-1.68' Light gray sand with brown streaks trace silt and few pebbles. 1.08'-1.25' Dark gray clay with some silt.
8'				
10'				

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10'				SI: 10.0' - 12.0' BLS RE: 0.9'
		SS#2	17	0.0' - 0.2' Dark gray clay with some silt- few pebbles.
			21	1.2' - 0.9' Light gray medium sand - some silt.
			39	
12'			33	
14'				SI: 15.0' - 17.0' BLS RE: 1.33'
		SS#3	4	0.0' - 0.2' Gray clay with some pebbles (heave)
16'			6	0.2' - 1.33' Light gray medium to fine sand with trace
			11	silt.
			10	*NOTE: Oil sheen on wash water while cleaning SS#3 from 15'
18'				from 15' to 17' BLS.
20'				SI: 20.0' - 22.0' RE: 2.0'
		SS#4	6	0.0' - 0.1' Gray clay with pebbles.
			7	0.1' - 2.0' Light gray coarse to fine sand with small black
			8	angular fragments. (Less than 2 cm diameter).
22'			8	
24'				SI: 25.0' - 27.0' RE: 1.0'
		SS#5	11	0.0' - 1.0' Light gray coarse to medium sand.
26'			8	

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DRILLING LOG

MW- 21 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
26'		SS#5 (cont.)	10	
			11	
28'				
30'				SI: 30.0' - 32.0' BLS RE: No recovery
		SS#6	12	
			17	No recovery. Cuttings indicate still in medium sand.
			17	
32'			19	
34'				SI: 35.0' - 37.0' BLS RE: 1.0'
		SS#7	10	0.0' - 0.5' Light gray medium to fine sand.
36'			12	0.5' - 1.0' Light gray coarse sand with angular and rounded
			9	fragments (diameter less than 2 cm.)
			10	
38'				
40'				SI: 40.0' - 42.0' BLS RE: 0.0'
		SS#8	12	All wash - poorly sorted (.1 cm to 3 cm).
			17	Pebbles - green, black, pink, brown, white
			20	No recovery - cuttings indicate still in sand.
42'			25	

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DRILLING LOG

MW- 21 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
42'				
44'				
				SI: 45.0' - 47.0' BLS RE: .25'
		SS#9	5	0.0 - 0.25' Gray coarse sand with gravel (gravel black,
			7	green, orange).
46'			9	
			12	
48'				
50'				SI: 50.0' - 52.0' BLS RE: 0.66'
		SS#10	19	0.0' - 0.66' Tan coarse sand with green, black, orange,
			20	brown fragments (diameter less than 2 cm).
			18	
52'			21	
54'				
				SI: 55.0' - 57.0' RE: 0.0' No Recovery
		SS#11	12	*NOTE: Small amount (less than 0.1') tan sand in nose. Cuttings
			20	indicate still in sands.
56'			20	
			29	
58'				

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DRILLING LOG

MW- 21 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
58'				
60'		SS#12	10	SI: 60.0' - 62.0' BLS RE: 1.2'
			10	0.0' - 1.2' Reddish brown clay (almost rust color).
			15	
62'			25	
64'				SI: 65.0' - 66.5' BLS RE: 1.5'
		SS#13	30	0.0' - 1.5' Dark black clay-dry.
66'			39	
			69	
68'				
70'				
72'				
74'				

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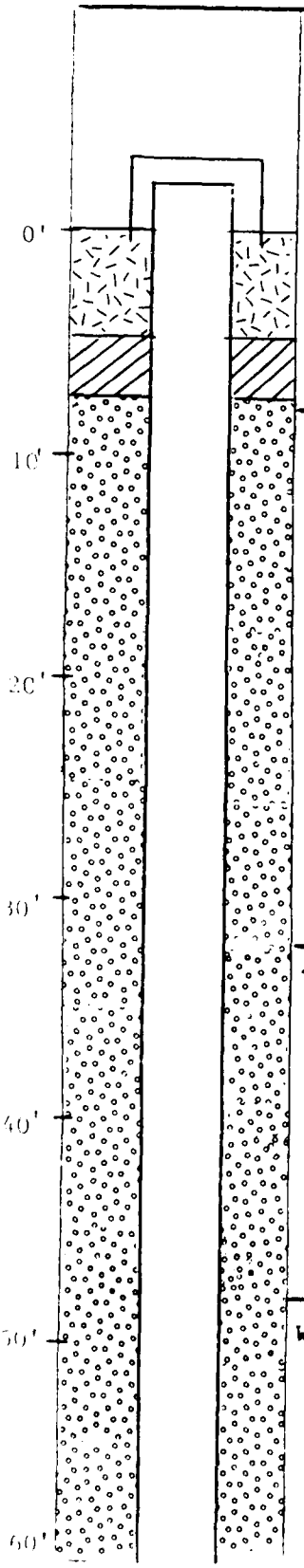
WELL CONSTRUCTION SUMMARY

Project: Dover AFB Owner: U.S. Air Force Well No.: MW- 22



Drilling Summary:

Total Depth: Drilled to 62' BLS Drillers: Calvin Wallace
Borehole Diameter(s): 8" Calvin Wallace (Delmarva)
Rig Type: Failing 1250 Hydraulic Rotary
Elevation: Land Surface: Bit(s): Drag
Top of Casing: 20.19' Drilling Fluid Type: Water/Bentonite
Supervisory Geologist: Ed Tokarski Amount Use:
Log Book No. 2 pp. 7-10 Water Level: 8.78' 11/19/84; 1410

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2" ID 2½' OD Diameter: 2"
Length: 12' Slot: .010; 5/in
Filter: Material: 4Q Sand Setting: 10. to 60' BLS
Setting: 8-60' BLS Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement Setting: 5.8 - 8.0' BLS
Setting: LS-5.8' BLS Surface Casing: Steel/PVC
Other:

Time Log:

	Started		Completed	
Drilling:	10/30/84	0800	10/30/84	1200
Installation:	10/30/84	1325	10/30/84	1430
Water Level Reading:		10' BLS	10/30/84	1330
Development:				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10 gpm for minimum 2 hours and until clear.

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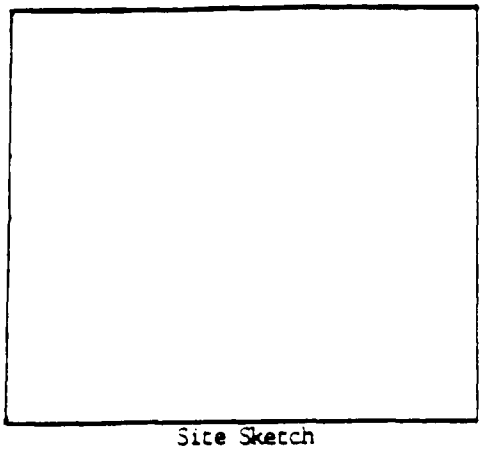
DRILLING LOG

Project: Dover AFB **Owner:** US Air Force **Well No.:** MW- 22



Site Sketch

Location: Downgradient app. 20 ft NE Site D-5
Reference Point: Land Surface
Reference Point Elevation:

Field Book No.: 1 pp 7-10
Log By: Ed Tobarski
Driller: Calvin Wallace - Delmarva
Rig Type: Failing 1250 Hydraulic Rotary
Total Depth: Drilled to 62.0' BLS well to 60' BLS.

	Date	Time
Drilling Started:	10/30/84	0800
Drilling Completed:	10/30/84	1200
Water Level:	8.78 11/19/84	1410

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0'				
2'				
4'				SI: 4.0'-6.0' BLS RE: .7'
		SS#1	10	0.0'-0.4' Light gray clay with red brown streak.
			4	0.4'-0.7 Light gray sand with some silt, some gravel
			5	(diameter less than 1 cm).
6'			5	
8'				
10'				

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DRILLING LOG

MW- 22 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10'		SS#2	16	SI: 10.0' - 12.0' BLS RE 2.0'
			24	0.0' - 0.55' Light gray coarse sand with pebbles.
			27	0.55'- 1.5' Black clay with some organic matter; some
12'			35	silt.
				1.5 - 2.0' Light gray clay.
14'				
		SS#3	16	SI: 15.0 - 17.0' BLS RE: 1.15'
16'			24	0.0' - 0.2' Black clay with trace organic matter.
			27	0.2' - 1.15' Light gray to white, medium to fine sand,
			35	trace gravel.
18'				
20'				SI: 20.0' - 22.0' BLS RE: 1.15'
		SS#4	17	0.0' - 0.4' Light gray to white medium sand.
			12	0.4' - 1.15' Light gray to white medium to fine sand.
			14	
22'			20	
24'				SI: 25.0' - 27.0' BLS RE: 0.75'
		SS#5	15	0.0' - 0.75' Light gray to white fine sand.
26'			17	

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DRILLING LOG

MW- 22 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
26'		SS#5 cont.	17	
			23	
28'				
30'				SI: 30.0' - 32.0' BLS RE: 0.7'
		SS#6	11	0.0' - 0.7' Light gray to white firm sand, trace gravel.
			15	
			14	
			15	
34'				
		SS#7	10	SI: 35.0' - 37.0' BLS RE: 0.75'
			12	0.0' - 0.75' Light gray coarse to fine sand.
36'			11	
			15	
38'				
		SS#8	10	SI: 40.0' - 42.0' BLS RE: 0.75'
40'			16	0.0' - 0.75' Poorly sorted, light gray coarse to fine sand with some gravel.
			19	
42'			27	

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DRILLING LOG

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
42'				
44'				SI: 45.0' - 47.0' BLS RE: 0.5'
		SS#9	12	0.0' - 0.5' Light gray to white coarse, sand, with brown-
46'			13	red streaking.
			14	
			21	
48'				
50'				SI: 50.0' - 52.0' BLS RE: 0.0'
		SS#10	10	No recovery - cuttings indicate still in same formation
			13	
			24	
52'			23	
54'				
			25	SI: 55.0' - 57.0' BLS RE: 0.45'
			21	0.0' - 0.45' - Tan fine sand.
56'			27	
			35	
58'				

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DRILLING LOG

MW- 22 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
58'				
				SI: 60.0' - 62.0' BLS RE: 1.0'
60'		SS#12	5	0.0' - 0.5' Brownish-red clay.
			8	0.5' - 1.0' Light olive brown clay with gray laminations.
			12	(Light olive brown = 2.5Y 5/5/6)
62'			19	
64'				
66'				
68'				
70'				
72'				
74'				

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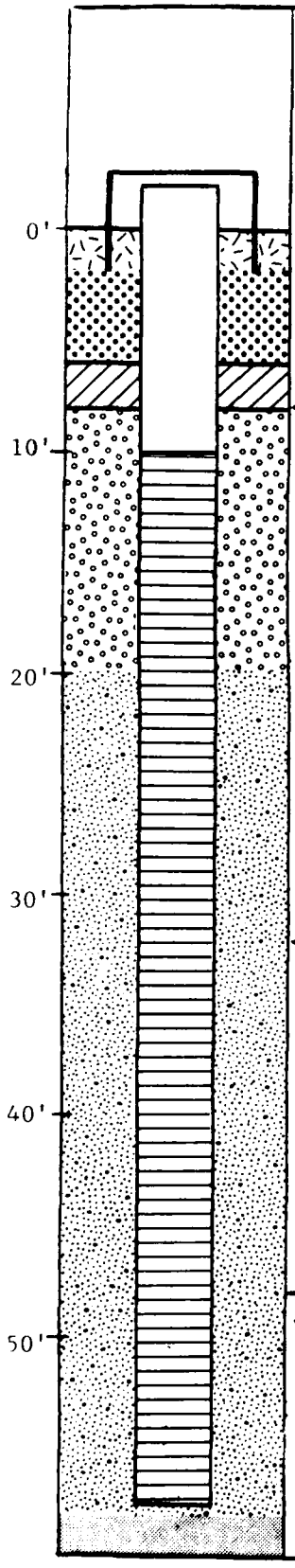
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-23



Drilling Summary:

Total Depth: 57' BLS
Borehole Diameter(s): 6"
Elevation: Land Surface: 19.44'
Top of Casing: 21.39'
Supervisory Geologist: Andris Lapins
Log Book No. 1 pp. 55-69
Drillers: Gary Truver
Walton Drilling
Rig Type: CME-55 : Auger
Bit(s): Auger
Drilling Fluid Type: Water
Amount Use:
Water Level: 10.5' BLS 1/9/85

Well Design:

Casing: Material: PVC
Diameter: 2" ID 2 1/4"OD
Length: 12'
Filter: Material: Formation/4Q Sand
Setting: 19.5'-57' BLS/8'-19.5' BLS
Grout: Type: #1 Portland Cement/Ben
Setting: 2.5'-6' BLS
Screen: Material: PVC
Diameter: 2"
Slot: 0.010; 5/inch
Setting: 10'-57' BLS
Seals: Type: Bentonite
Setting: 6'-8' BLS
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	10/29/84	1545 hrs	10/30/84	1012 hrs
Installation:	10/30/84	1040 hrs	10/30/84	1240 hrs
Water Level Reading:			1/9/85	10.5' BLS
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped twice at 10 gpm for 2 hours and until clear

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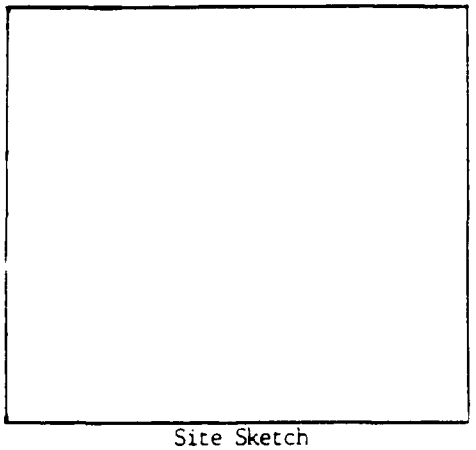
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-23



Site Sketch

Location: Site D-4

Reference Point: Land Surface

Reference Point Elevation: 19.44'

Field Book No.: 1 pp 55-69

Log By: Andris Lapins

Driller: Gary Turver (Walton)

Rig Type: CME-55 / Auger

Total Depth: 57' BLS

	Date	Time
Drilling Started:	10/29/84	1545
Drilling Completed:	10/30/84	1240
Water Level:	10.5' BLS	1/9/85

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				Legend: SI: Sampling Interval; RE: Recovery; SS: Split Spoon; C: Cuttings. Gradation: Trace 1-12%; Little 12-20%; Some 20-30%; Add "Y" >30%
0				
		SS#1		SI: 4-6' BLS RE: 1.8'
			4	1.8' - Light olive gray (5Y 6/2) silt, some very fine
5			5	sand and clay; brown mottling; damp; friable.
			5	
			6	
		SS#2		SI: 9-11' BLS RE: 1.75'
			9	0.45' - Same as above
10			9	1.3' - Gray (5Y 6/1) fine to medium sand, little gravel

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DRILLING LOG

MW-23 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	14	trace silt and clay grading to yellowish brown
			16	(10YR 5/6) fine sand some silt, trace clay; wet.
		SS#3		SI: 14-16' BLS RE: 2.0'
			2	0.1' - Yellowish brown (10YR 7/6) fine to medium sand,
			2	some silt, trace clay; loose; wet.
15			3	1.55' - Black (7.5R 2.5/0) clay, trace very fine sand and
			15	silt; trace organic matter; firm; medium dense; damp.
				0.35' - Gray (5Y 6/1) fine sand, trace clay; loose; wet.
		SS#4		SI: 19'-21' BLS RE: 1.0'
			5	1.0' - Gray (5Y 6/1) medium sand, little light gravel, trace
			7	clay; loose; wet.
20			10	
			11	
		SS#5		SI: 24-26' BLS RE: 1.5'
			5	1.5' - Same as above
25			7	

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DRILLING LOG

MW-25 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	7	
			10	
		SS#6		SI: 29-31' BLS RE: 1.0'
			4	0.65' - White to light gray (5Y 8/1) fine sand, some silt,
30			8	loose, wet.
			13	0.35' - Light gray medium to coarse sand, some gravel;
			16	poorly sorted; loose; wet.
		SS#7		SI: 34-36' BLS RE: 0.5'
			7	0.5' - White (5Y 8/1) fine sand, trace light gravel;
35			10	loose; wet.
			14	
			16	
		SS#8		SI: 39-41' BLS RE: 1.0'
			6	1.0' - Same as above
40			5	

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DRILLING LOG

MW-23 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	7	
			10	
		SS#9		SI: 44-46' BLS RE: 1.3'
			8	0.5' - Same as above
			6	0.8' - White to light gray (5Y 7/2) sand and gravel,
45			12	some clay; few rounded pebbles; poorly sorted;
			17	loose; wet.
		SS#10		SI: 49-51' BLS RE: 0.7'
			9	0.4' - Pale yellow (5Y 8/4) medium sand and gravel, trace
			12	silt; poorly sorted; loose; wet.
50			12	0.3' - Yellowish brown (10YR 5/8) fine to medium sand, some
			15	silt; little gravel, few large pebbles; poorly sorted
				loose, wet.
		SS#11		SI: 54-56' BLS RE: 0.85'
			14	0.2' - Brownish yellow (10YR 6/8) medium sand, trace silt;
			35	loose; wet.
55			73	0.15' - Very pale brown (10YR 8/4) fine sand; loose; wet.

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DRILLING LOG

MW-23 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	30	0.1' - Yellowish brown (10YR 5/6) medium sand and gravel, some silt and clay; poorly sorted; wet.
				0.2' - Black (2.5Y 2/0) very fine sand, some silt; loose; wet. Driller reports hitting clay layer at @ 57' BLS.
		SS#12		SI: 58-60' BLS RE: 1.8'
			4	0.2' - Brownish yellow (10YR 6/8) fine sand, trace gravel
			5	and silt; loose; wet.
			8	1.8' - Very dark gray (5Y 3/1) silty clay, trace very fine
60			8	sand; light gray very fine sand and silt laminations; dense; firm.
65				
70				

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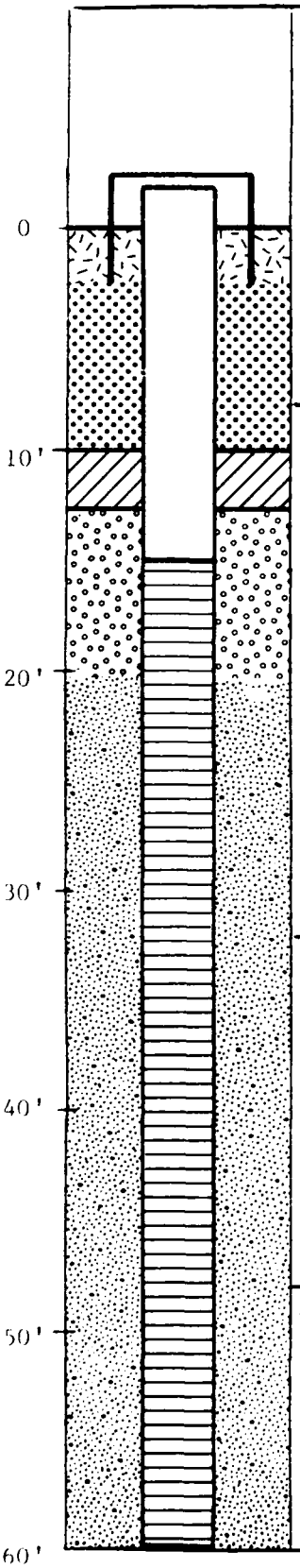
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-24



Drilling Summary:

Total Depth: 60' BLS
Borehole Diameter(s): 6"
Drillers: Gary Truver
Walton Drilling
Rig Type: CME-55 : Auger
Elevation: Land Surface: 23.68'
Top of Casing: 25.61'
Bit(s): Auger
Drilling Fluid Type: Water
Supervisory Geologist: Andris Lapins
Amount Use:
Log Book No. 1 pp. 70-84
Water Level: 14.75' BLS 10/31/84
15.06' BLS 1/9/85

Well Design:

Casing: Material: PVC
Diameter: 2" ID 2 1/4"OD
Length: 17"
Screen: Material: PVC
Diameter: 2"
Slot: 0.010; 5/inch
Filter: Material: Formation/4Q Sand
Setting: 20.5-60' BLS/12.5-20.5'BLS
Setting: 15'-60' BLS
Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben
Setting: 2'-10' BLS
Setting: 10'-12.5' BLS
Surface Casing: Steel/PVC
Other: Protective steel casing cemented in to land surface.

Time Log:

	Started		Completed	
Drilling:	10/30/84	1420 hrs	10/31/84	0837 hrs
Installation:	10/31/84	0919 hrs	10/31/84	1150 hrs
Water Level Reading:	14.75' BLS	10/31/84	1/9/85	15.06' BLS
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped twice at 10 gpm for 2 hours and until clear

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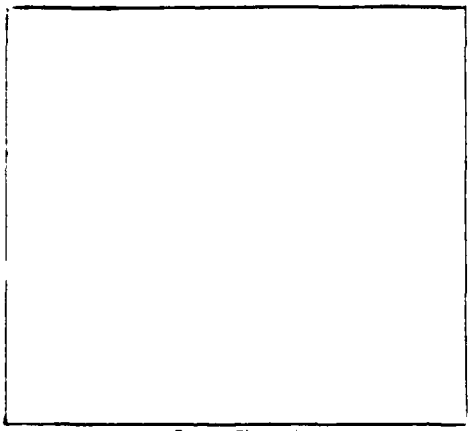
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-24



Site Sketch

Location: Site S-1

Reference Point: Land Surface

Reference Point Elevation: 23.68'

Field Book No.: 1 pp 70-84

Log By: Andris Lapins

Driller: Gary Truver (Walton)

Rig Type: CME-55 : Auger

Total Depth: 60' BLS

	Date	Time
Drilling Started:	10/30/84	1420hr
Drilling Completed:	10/31/84	1150
Water Level:	14.75' BLS	10/31/84
	15.06' BLS	9/1/85

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" 30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		SS#1		SI: 4-6' BLS RE: 1.7'
			2	1.7' - Light yellowish brown (2.5Y 6/4) silt, trace very
5			3	fine sand with strong brown (7.5YR 5/8) silt
			4	laminations (0.05 to 0.2' in thickness); moist.
			4	
		SS#2		SI: 9-11' BLS RE: 1.9'
			5	0.3' - Yellowish brown (10YR 5/8) silt, some clay; moist.
10			6	

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DRILLING LOG

MW-24 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	9	0.4' - Grayish brown (2.5Y 5/2) clay, some silt and sand,
			9	little gravel, few rounded quartz pebbles.
				0.1' - Yellowish red (5YR 5/8) clay, some silt and sand;
				little gravel.
				0.1' - Black (5YR 2.5/1) sand, silt, and clay.
				1.0' - Pale yellow (2.5Y 7/4) fine to coarse sand and gravel,
				few rounded pebbles; poorly sorted; medium dense; damp.
		SS#3		SI: 14-16' BLS RE: 1.8'
			1	1.8' - Light gray fine sand, some silt, little gravel;
15			4	loose to medium dense; saturated.
			4	
			7	
		SS#4		SI: 19-21' BLS RE: 1.9'
			1	Light gray (2.5Y 7/0) fine sand, some silt, trace clay;
20			1	saturated.
			2	
			5	Static water level in Auger @ 15.7' BLS.
		SS#5		SI: 24-26' BLS RE: 1.4'
			2	1.4' - White to light gray (5Y 8/2-7/2) medium to coarse sand,
25			4	some gravel, trace silt; loose; saturated.

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DRILLING LOG

MW-24 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	7	
			5	
		SS#6		SI: 29-31' BLS RE: 0.4'
			9	0.4' - Same as above
			9	
30			8	
			7	
		SS#7		SI: 34-36' BLS RE: 1.3'
			5	1.3' - Pale yellow fine to medium sand, some gravel,
			6	trace silt; poorly sorted; loose; saturated.
35			7	
			8	
		SS#8		SI: 39-41' BLS RE: 0.8'
			2	Pale yellow (2.5Y 8/4 to 7.4) medium to coarse sand,
			3	some gravel, trace silt; loose; saturated.
40				

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DRILLING LOG

MW-24 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	5	
			7	
		SS#9		SI: 44-46' BLS RE: 0.8'
			8	0.6' - Pale yellow (5Y 7/4) fine sand, trace silt and
45			9	gravel; loose; saturated.
			12	0.2' - Brownish yellow medium to coarse sand and gravel,
			12	trace sitl; loose; saturated.
		SS#10		SI: 49-51' BLS RE: 0.7'
			7	0.7' - Pale yellow fine to medium sand, trace silt and
50			5	gravel; emerald green spots-mineral; loose;
			8	saturated.
			14	
		SS#11		SI: 54-56' BLS RE: None
			7 7	Two sample attempts - no recovery.
55			7 7	Drilling continued cautiously.

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DRILLING LOG

MW-24 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	11 7	
			13 11	
		SS#12		SI: 59-61' BLS RE: 0.3'
			7	0.3' - Brownish yellow (10YR 6/8) medium to coarse sand,
60			11	trace silt and gravel; poorly sorted; loose; wet.
			14	
			19	
				Driller reports entering clay layer at @ 61.5' BLS.
		SS#13		SI: 64-66' BLS RE: 1.0'
			6	1.0' - Very dark gray silty clay, trace very fine sand;
			12	light gray very fine sand an' silt laminations;
65			14	dense; firm.
			15	
70				

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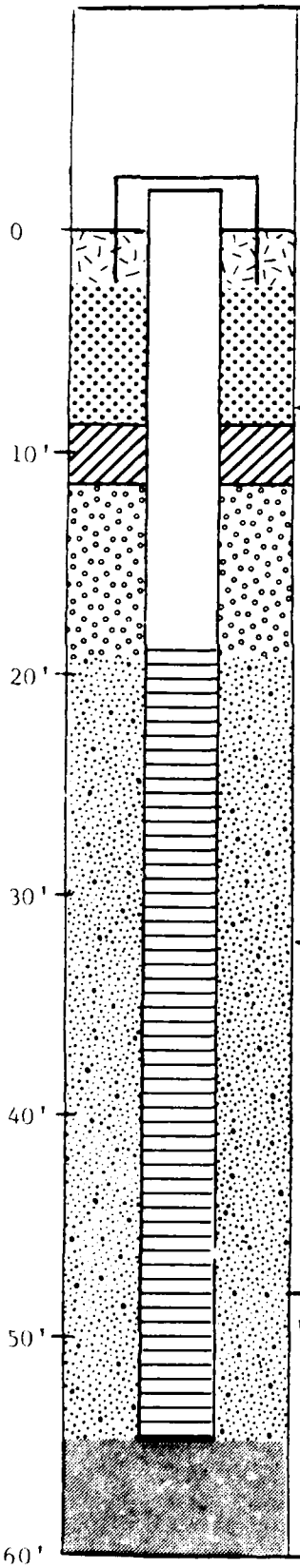
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-25



Drilling Summary:

Total Depth: 55' Drillers: Gary Truver
Borehole Diameter(s): 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 24.52' Bit(s): Hollow stem auger
Top of Casing: 26.82' Drilling Fluid Type: None
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 5 pp. 27-35 Water Level: 18.7' 11/8/84

Well Design:

Casing: Material: Schedule 40 PVC Screen: Material: Schedule 40 PVC
Diameter: 2" ID 2 3/8"OD Diameter: 2"
Length: 20' Slot: 0.010; 5 slots/inch
Filter: Material: 4Q Sand Setting: 18'-55'
Setting: 16'-19' Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 9'-11'
Setting: LS-9.0' Surface Casing: Steel/PVC
Other: Formation allowed to cave, providing natural sand pack from 19.0 - 55.0'. Protective steel casing cemented into land surface.

Time Log:

	Started		Completed	
Drilling:	11/7/84	1540 hrs	11/8/84	1050 hrs
Installation:	11/8/84	1059 hrs	11/8/84	1130 hrs
Water Level Reading:			11/8/84	0820 hrs
Development :				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped twice at 10 pgm for minimum 2 hours and until clear.

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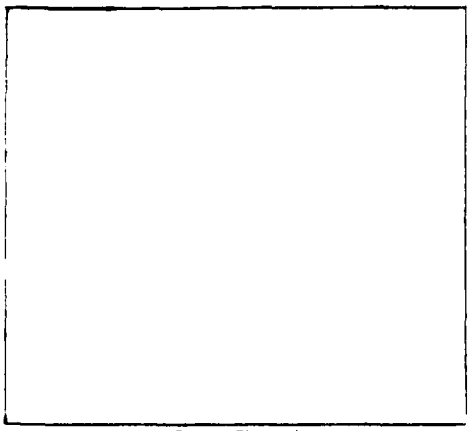
DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-25



Site Sketch

Location: Hazardous Waste Storage Area

Field Book No.: 5 pp 27-35

Log By: Rick Eades

Driller: Gary Truver

Rig Type: CME Auger

Reference Point: Land Surface

Total Depth: 55'

Reference Point Elevation:

	Date	Time
Drilling Started:	11/7/84	1540hrs
Drilling Completed:	11/8/84	1050
Water Level: 18.7'	11/8/84	0820

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				Legend: SI: Sampling Interval; RE: Recovery; SS: Split Spoon; C: Cuttings. Gradation: Trace 1-12%; Little 12-20%; Some 20-30%; And "Y" 30%
0				
		C		Medium to dark brown silt, some clay.
		C		Dark yellowish brown clay.
		SS#1		SI: 4-6' BLS RE: 2.0'
			3	0.7' - Orangish brown (10YR 6/8) clay, some silt.
5			6	1.3' - Grayish brown (10YR 5/2) silt, some clay.
			9	
			7	
		C		Orange brown to gray brown silt and clay interbedded.
		SS#2		SI: 9-11' BLS RE: 1.9'
			2	1.1' - Gray (10YR 7/2) clay with thin interbeds of
10			3	orangish brown silt.

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DRILLING LOG

MW-25 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	8	0.8' - Various colored (orange, brown, dark gray,
			6	black) coarse sand.
		C		Brown clay, some silt.
		SS#3		SI: 14'16' BLS RE: 1.5'
			5	0.3' - Brownish gray (10YR 5/2) clay.
15			7	1.2' - Light gray (7.5YR 7/1) coarse to medium sand,
			5	some quartz pebbles and cobbles up to 1.0" in
			9	diameter.
		C		Light gray, coarse to medium sand.
		SS#4		SI: 19-21' BLS RE: 1.9'
			2	1.9' - Light gray (5YR 7/1) to white, coarse to fine
20			2	sand, some pebbles, wet.
			1	
			3	
		C		Light gray sand, very wet.
		SS#5		SI: 24-26' BLS RE: 1.1'
			4	1.1' - Light gray (5YR 7/1) coarse to medium sand.
25			4	

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DRILLING LOG

MW-25 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	5	
			6	
		C		Light gray, fine to medium sand.
		SS#6		SI: 29-31' BLS RE: 1.5'
			3	1.5' - Light gray (5YR 7/1) coarse to fine sand,
30			3	trace silt.
			4	
			4	
		C		Light gray sand.
		SS#7		SI: 34-36' BLS RE: 1.9'
			1	0.5' - Light gray (5YR 7/1) coarse to medium sand.
35			2	1.4' - Tan (10YR 5/6) coarse to medium sand.
			2	
			2	
		C		Tan, coarse to fine sand.
		SS#8		SI: 39-41' BLS RE: 1.7'
			4	1.7' - Light grayish brown (10YR 6/2) coarse sand,
40			2	some medium to fine sand, some pebbles.

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DRILLING LOG

MW- 25 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	2	
			5	
		C		Tan to yellowish brown, coarse to medium sand, trace
				silt, trace pebbles.
		SS#9		Upon lowering split spoon sampler, discovered over 2.0' of
				heave in augers. Decided sample recovery would be impossible.
45				
		C		Light to medium brown, fine to coarse sand.
		C		Light brown, fine to coarse sand, trace pebbles.
		SS#10	10	SI: 49-51' BLS RE: 0.5'
			12	0.5' - Tan (10YR 6/2) to yellowish brown (10YR 5/8)
50			15	coarse to very coarse sand.
			15	
		C		Light yellowish brown coarse sand, trace very coarse
				sand, some fine sand.
		SS#11		SI: 54-56' BLS RE: 0.6'
			9	0.6' - Dark yellowish brown (10YR 4/6) coarse to very
55			9	coarse sand, noted trace of clay on bottom

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DRILLING LOG

MW-25 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#11	9	edge of sampler
			9	Driller estimated clay contact at approximately 55' BLS.
		SS#12		SI: 56-57.5' RE: 1.5'
			3	1.5' - dark gray (5YR 4/1) clay, silty, dense
			4	finely laminated.
			6	
60				
65				
70				

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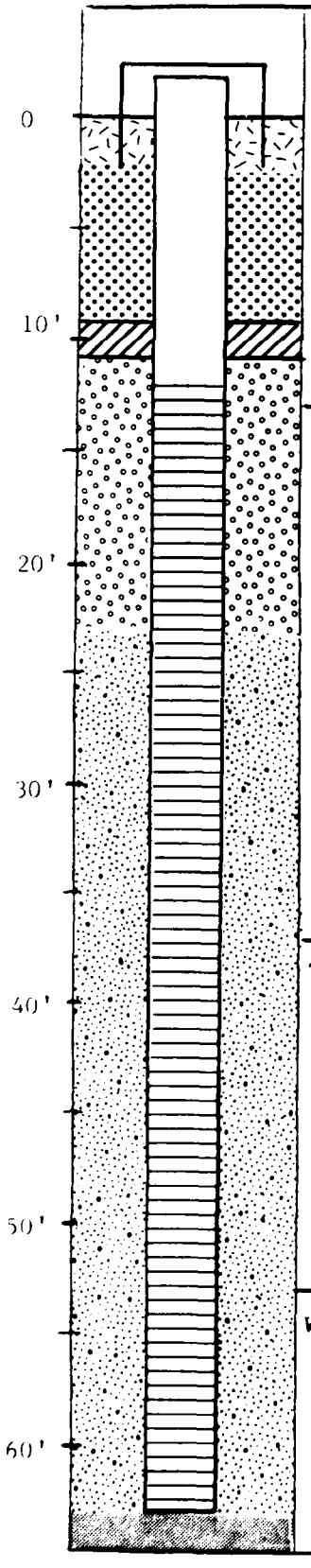
WELL CONSTRUCTION SUMMARY

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-27



Drilling Summary:

Total Depth: 63' Drillers: Gary Truver
Borehole Diameter(s): 6" Walton Corporation
Rig Type: CME Auger
Elevation: Land Surface: 22.21' Bit(s): Hollow stem auger
Top of Casing: 24.21' Drilling Fluid Type: None
Supervisory Geologist: Richard Eades Amount Use:
Log Book No. 5 pp. 36-51 Water Level: 13.5' BLS 11/9/84

Well Design:

Casing: Material: Schedule 40 PVC Screen: Material: Schedule 40 PVC
Diameter: 2" ID 2 3/8"OD Diameter: 2"
Length: 15' Slot: 0.010; 5 slots/inch
Filter: Material: 4Q Sand Setting: 13-63'
Setting: 11'-23' Seals: Type: Bentonite
Grout: Type: #1 Portland Cement/Ben Setting: 9'-11'
Setting: LS-9.0' Surface Casing: Steel/PVC
Other: Formation allowed to cave, providing natural sand pack from 23.0 - 63.0'. Protective steel casing cemented into land surface.

Time Log:

	Started		Completed	
Drilling:	11/8/84	1330 hrs	11/12/84	1100 hrs
Installation:	11/12/84	1100 hrs	11/12/84	1200 hrs
Water Level Reading:			11/9/84	0900 hrs
Development:				

Well Development:

Method/Equipment: Air blown for 8 hours, pumped at 10 gpm for minimum 2 hours and until clear.

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DRILLING LOG

Project: Dover AFB **Owner:** U.S. Air Force **Well No.:** MW-27

Site Sketch

Location: Hazardous Waste Storage Area Site S-1
Reference Point: Land Surface
Reference Point Elevation:

Field Book No.: 5 pp 36-51
Log By: Rick Eades
Driller: Gary Truver
Rig Type: CME Auger
Total Depth: 63'

	Date	Time
Drilling Started:	11/8/84	1330hrs
Drilling Completed:	11/12/84	1100
Water Level: 13.5'	11/9/84	0900

Legend
SI: Sampling Interval
RE: Recovery
SS: Split Spoon
C: Cuttings

Gradation
Trace 1-12%
Little 12-20%
Some 20-30%
Add "Y" 30%

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0				
		C		Brown silt, some clay, some fine sand, trace pebbles.
		SS#1		SI: 3.5-5.5' RE: 1.3'
			3	1.3' - Grayish brown (10YR 5/2) clay with thin interbeds
			4	of orange silt.
5			5	
			6	
		C		Light grayish brown clay.
		C		Light gray silt, trace sand, trace clay.
		SS#2		SI:
			8	
			12	
10			22	

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DRILLING LOG

MW- 27 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
10		SS#2	8	SI: 8.5-10.5' BLS RE: 1.3'
			12	0.3' - Orange brown (5YR 4/6) coarse sand.
			22	0.4' - LIght gray (10YR 7/1) fine sand.
			25	0.5' - Light gray (10YR 7/1) fine sand.
				0.3' - Light yellow brown (10YR 5/8) fine to medium sand.
		C		Light yellowish brown, sand, some silt, trace clay.
		SS#3		SI: 13.5-15.5' BLS RE: 1.9'
			1	1.9' - Light gray (10YR 7/1) coarse to fine sand, some
			2	silt, wet.
15			1	
			2	
		C		Light gray, fine to medium sand.
		SS#4		SI: 18.5-20.5' BLS RE: 1.6'
			5	1.6' - Light gray (10YR 7/1) coarse to medium sand,
			10	some pebbles.
20			9	
			11	
		C		Light gray sand.
		SS#5		SI: 23.5-25.5' BLS RE: 0.5'
			10	0.5' - Light gray (5Y 7/1) coarse to medium sand,
			7	some pebbles, trace clay.
25			10	

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DRILLING LOG

MW-27 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
25		SS#5	8	
		SS#6		SI: 28.5-30.5' BLS RE: 0.8'
			5	0.8' - Yellowish brown (10YR 7/6) coarse to medium
			8	sand, some pebbles.
			9	
30			12	
		SS#7		SI: 33.5-35.5' BLS RE: 1.3'
			5	1.3' - Yellowish brown (10YR 7/8) coarse to fine
			5	sand, trace pebbles.
			6	
35			8	
		C		Gray to grayish brown sand.
		SS#8		SI: 38.5-40.5' BLS RE: 0.8'
			4	0.8' - Light brown (10YR 7/6) coarse to medium
			8	sand, some pebbles.
40			8	

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DRILLING LOG

MW-27 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
40		SS#8	9	
		C		Light grayish brown, fine to medium sand.
		SS#9		SI: 43.5-45.5' BLS RE: 1.2'
			9	0.5' - Yellowish brown (10YR 7/8) coarse to medium sand.
			10	0.7' - Dark yellowish brown (10YR 5/8) coarse to very
45			9	coarse sand, some cobbles.
			10	
		C		Yellowish brown, coarse to medium sand, some cobbles.
				Note: No split spoon sample attempted for the interval
				of 48.5-50.5' since over 2.0' of heave occurred
				in augers.
50				
		SS#10		SI: 53.5-55.5' BLS RE: 0.6'
			6	0.6' - Yellowish brown (10YR 5/8) coarse sand and
			8	cobbles.
55			10	

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DRILLING LOG

MW-27 cont.

Depth (feet)	Graphic Log	Sample type and Number	Blow Count (N)	DESCRIPTION
55		SS#10	10	
		C		Yellowish brown coarse to medium sand.
		C		Gravel layer, approximately 1.0' thick.
		SS#11		SI: 58.5-60.5' BLS RE: 0.7'
			20	0.7' - Yellowish brown (10YR 5/8) coarse to very
			17	coarse sand and cobbles.
			25	
60			27	
		SS#12		SI: 63.5-65.5' BLS RE: 1.6'
			10	0.2' - Dark brown interbedded sand and clay.
			8	1.0' - Yellowish red clay.
			10	0.4' - Dark gray (5YR 4/1) dense clay, silty,
65			10	finely laminated.
70				

APPENDIX E: Field Data

TABLE E-1
FIELD ANALYTICAL DATA FOR GROUNDWATER SAMPLES

Monitoring Location	Date of Sample	pH (Std. Units)	Conductivity (uMhos/cm)	Temperature (°C)
01j	12/6/84	4.5	165	28
	2/22/85	4.68	163	19.5
02j	12/6/84	6.3	275	16
	2/22/85	5.98	136	14.5
04j	12/6/84	5.2	500	15
	2/22/85	4.76	480	12.5
05j	12/4/84	4.6	145	14.7
06j	12/4/84	3.8	250	14
07j	12/4/84	5.0	200	14
08j	12/4/84	5.0	380	14
09j	12/4/84	4.35	200	15
10	11/29/84	5.3	125	13
	2/21/85	5.6	162.5	8.1
11	11/29/84	5.7	112	13
	2/21/85	5.76	163	9.0
12	11/29/84	5.45	80	12
	2/21/85	5.35	132	9.9
13	11/30/84	6.21	250	13
	2/21/85	6.02	2600	9.9
14	12/4/84	4.8	55	12.8
15	12/4/84	5.4	450	13
16	12/4/84	4.6	65	12
17	12/4/84	4.5	145	12.8
18	12/11/84	5.3	130	14
19	12/11/84	5.6	120	14
20	12/11/84	5.9	200	14
21	11/30/84	5.6	148	15
	2/21/85	5.72	146	8.5
22	11/30/84	5.51	90	15
	2/21/85	5.4	139	9.8
23	11/30/84	5.1	155	15
	2/21/85	5.16	175	9.5
24	12/11/84	6.4	170	15.7
	2/21/85	5.84	480	11.9
25	12/11/84	5.7	100	16.0
	2/21/85	5.66	178	12.0
27	12/11/84	5.7	125	15.5
	2/21/85	5.31	169	12.5
101	12/6/84	4.8	200	14.6
	2/22/85	4.93	220	12.1
102	12/6/84	5.3	400	15
	2/22/85	5.66	470	12.1
103	12/6/84	5.7	1300	12.2
	2/22/85	5.29	260	12.0
p01	12/11/84	6.70	250	17.0
p02	12/11/84	5.9	160	16.1
p03	12/11/84	6.4	200	17.6
p05	12/6/84	6.6	250	13.7
p06	12/6/84	7.3	400	14
p07	12/6/84	6.5	700	15
p08	12/6/84	6.1	130	14

TABLE E-2

FIELD ANALYTICAL DATA FOR SURFACE WATER SAMPLES

Monitoring Location	Date of Sample	pH (Std. Units)	Conductivity (uMhos/cm)	Temperature (°C)
SW1	12/12/84	8.25	620	11.1
	2/22/84	7.58	510	8.2
SW2	12/12/84	7.8	720	9.2
SW3	12/7/84	6.4	110	4
SW4	12/7/84	6.2	150	7.5
SW5	12/7/84	6.7	220	3.8
SW6	12/7/84	6.6	155	7
SW7	12/7/84	6.4	132	4
SW8	12/7/84	6.6	120	1.6
SW9	12/14/84	6.9	300	12.9
SW10	12/14/84	6.5	185	12.6
SW11	12/13/84	6.7	140	8.9
SW12	12/13/84	6.9	135	8.5
SW13	12/13/84	6.8	140	9.6
SW14	12/13/84	6.4	80	9.4

DOVER AFB DOVER DE. 2-827-00 [illegible] TIP PHASE II

WATER LEVELS

	WELL	DATE	TIME	LEVEL H_2O BTC	LEVEL H_2O MSL	well	DATE	TIME	LEVEL H_2O BTC	LEVEL H_2O MSL	
1	18	11/14/84	1059	12.62	7.11	021	11/15/84	1515	9.33	8.70	1
2	19	"	1118	9.99	6.28	022	"	1530	11.44	8.75	2
3	20	"	1125	6.19	6.15	023	"	1545	12.56	8.83	3
4	10	"	1150	13.53	8.85	024	"	1625	16.35	9.26	4
5	11	"	1210	12.96	8.80						5
6	12	"	1225	12.96	8.85	024	11/16/84	0730	16.23	9.38	6
7	13	"	1240	14.09	8.88	027	"	0738	15.02	9.19	7
8	21	"	1400	9.30	8.73	025	"	0744	17.35	9.47	8
9	22	"	1410	11.41	8.78	018	"	0801	12.63	7.10	9
10	23	"	1420	12.42	8.97	020	"	0805	6.19	6.15	10
11	24	"	1435	16.23	9.38	019	"	0814	10.01	6.26	11
12	25	"	1450	17.35	9.47	010	"	0820	13.48	8.90	12
13	27	"	1458	14.98	9.23	011	"	0825	12.94	8.82	13
14	015	"	1510	10.94	10.45	012	"	0826	12.91	8.90	14
15	101	"	1510	13.12	11.89	013	"	0828	14.07	8.90	15
16	102	"	1510	12.88	11.63	021	"	0830	9.27	8.76	16
17	103	"	1515	12.87	11.75	[illegible]	"	[illegible]	11.37	8.82	17
18	14	"	1515	15.23	5.93	023	"	[illegible]	12.47	12.47	18
19	C95	"	1600	11.79	4.56	P02	"	1040	17.19	10.16	19
20	C94	"	1600	13.06	4.34	101	"	1055	14.59	13.43	20
21	C75	"	1600	8.74	3.83	P03	"	1125	14.30	12.69	21
22	C87	"	1600	10.98	3.22	P08	"	1135	11.01	15.83	22
23	17	"	1600	7.05	3.22	P07	"	1140	9.91	16.17	23
24	15	"	1600	6.84	4.27	P05	"	1145	8.84	16.03	24
25	16	"	1600	6.53	4.04	P06	"	1145	14.10	14.77	25
26											26
27	018	11/15/84	1000	12.58	7.15	010	11/28/84	1012	13.6	8.78	27
28	018	"	1123	12.58	7.15	011	"	1307	13.06	8.70	28
29	019	"	1205	10.05	6.22	012	"	1314	13.03	8.78	29
30	020	"	1239	6.30	6.04	013	"	1318	14.18	8.79	30
31	013	"	1430	14.20	8.77						31

BTC = Below Top of Case
MSL = Mean Sea Level

DOVER AFB DOVER DE. 2-827-06-182-56 IRP PHASE II

WATER LEVELS.

	WELL	DATE	TIME	LEVEL H_2O BTC	LEVEL H_2O MSL	WELL	DATE	TIME	LEVEL H_2O BTC	LEVEL H_2O MSL	
1	02	11/29/84	0824	14.22	7.59	018	12/10/84	1100	12.58	7.15	1
2	023	"	0940	12.55	8.84	019	"	1200	4.94	6.33	2
3	022	"	1004	11.36	8.83	020	"	1214	6.19	6.15	3
4	021	"	1020	9.37	8.66	P02	"	1400	16.28	11.07	4
5						P01	"	1400	15.32	12.70	5
6	05J	12/3/84	1050	13.48	7.22	P03	"	1400	14.26	12.73	6
7	014	"	1155	15.29	5.87	024	"	1521	16.64	8.97	7
8	016	"	1220	6.36	4.21	025	"	1546	16.30	10.52	8
9	09J	"	1357	11.48	4.87	027	"	1600	15.41	8.80	9
10	015	"	1420	6.74	4.37						10
11	017	"	1430	7.1	3.17						11
12	06J	"	1456	13.03	4.37	(DATA BEFORE wells developed)					12
13	07J	"	1510	8.66	3.91	07J	11/9/84	0859	8.70	3.87	13
14	08J	"	1533	10.71	3.49	06J	"	0910	13.8	3.60	14
15						09J	"	0925	11.68	4.67	15
16	01J	12/5/84	0915	10.21	11.18	015		0937	6.82	4.29	16
17	04J	"	0930	14.68	10.72	016		0946	6.51	4.06	17
18	02J	"	0955	16.63	10.93	011		0955	15.18	5.98	18
19	101	"	1050	13.42	11.59						19
20	102	"	1050	13.08	11.43						20
21	103	"	1050	13.14	11.48						21
22	P08	"	1410	11.39	15.45						22
23	P07	"	1410	10.26	15.92						23
24	P06	"	1410	13.20	15.67						24
25	P05	"	1410	9.22	15.65						25
26											26
27											27
28											28
29											29
30											30
31											31

BTC = Below Top of Case

MSL = Mean Sea Level

DOVER AFB DOVER DE. 2-827-06-182-56 IRP PHASE II
WATER LEVELS.

	WELL	DATE	TIME	LEVEL H_2O BTC	LEVEL H_2O MSL	well	DATE	TIME	LEVEL H_2O BTC	LEVEL H_2O MSL	
1	01J	1/9/85	1125	4.51	9.88	P08	1/9/85	1105	11.83	15.01	1
2	02J	"	1135	16.89	10.67	101	"	1145		11.26	2
3	04J	"	1150	14.96	10.44	102	"	1140		11.11	3
4	05J	"	1320	13.26	6.81	103	"	1135		11.17	4
5	06J	"	1328	12.86	4.54	ST.4A	"	1150		8.66	5
6	07J	"	1331	8.48	4.09	ST.4B	"	1150		8.71	6
7	08J	"	1334	10.59	3.61	ST.5	"	1150		9.08	7
8	09J	"	1337	1461	4.74						8
9	010	"	1050	13.44	8.94						9
10	011	"	1103	12.92	8.84						10
11	012	"	1059	12.98	8.83						11
12	013	"	1054	14.10	8.87						12
13	014	"	1315	15.33	5.83						13
14	015	"	1320	6.79	4.32						14
15	016	"	1320	6.53	4.04						15
16	017	"	1325	7.07	3.20						16
17	018	"	1030	12.70	7.03						17
18	019	"	1040	9.66	6.66						18
19	020	"	1045	6.10	6.31						19
20	021	"	1109	9.21	8.79						20
21	022	"	1112	11.35	8.84						21
22	023	"	1116	12.45	8.94						22
23	024	"	1128	16.99	8.62						23
24	025	"	1124	18.13	8.69						24
25	027	"	1133	15.75	8.46						25
26	P01	"	1030	13.98	15.04						26
27	P02	"	1035	17.31	10.01						27
28	P03	"	1040	14.07	12.92						28
29	P05	"	1115	10.60	14.27						29
30	P06	"	1110	13.53	15.34						30
31	P07	"	1110	10.55	15.63						31

BTC = Below Top of Case
MSL = Mean Sea Level

DOVER AFB. DOVER DE. 2-827-06-182-56 INV PHASE II

WATER LEVELS.

	WELL	DATE	TIME	LEVEL H_2O BTC	LEVEL H_2O MSL	well	DATE	TIME	LEVEL H_2O BTC	LEVEL H_2O MSL	
1	01J	2/20/85	1334	10.34	11.05						1
2	02J	"	1324	15.91	11.65						2
3	04J	"	1327	13.85	11.55						3
4	05J	"	1223	12.15	7.92						4
5	06J	"	1226	11.44	5.96						5
6	07J	"	1229	7.13	5.44						6
7	08J	"	1231	9.33	4.87						7
8	09J	"	1235	10.19	6.16						8
9	010	"	1035	11.60	10.78						9
10	011	"	1500	11.83	10.73						10
11	012	"	1512	11.03	10.78						11
12	013	"	1514	13.18	9.79						12
13	014	"	1249	14.17	6.99						13
14	015	"	1245	5.66	5.45						14
15	016	"	1243	5.76	5.11						15
16	017	"	1240	6.10	4.17						16
17	021	"	0950	7.17	10.86						17
18	022	"	0855	9.39	10.80						18
19	023	"	1006	10.49	10.90						19
20	024	"	1754	15.58	10.03						20
21	025	"	1823	16.72	10.10						21
22	027	"	1806	14.45	9.76						22
23	101	"	1338	12.64	12.37						23
24	102	"	1340	12.30	12.21						24
25	103	"	1346	12.47	12.15						25
26											26
27											27
28											28
29											29
30											30
31											31

BTC = Below Top of Case
MSL = Mean Sea Level

APPENDIX F: Sampling and Analysis Instructions

SAMPLING INSTRUCTIONS:
Dover AFB Phase II Stage 1
(Prepared By JRB Laboratories)

(Note: For samples taken in duplicate, double number of containers)

WATER

1. Oil and Grease: Use 1-liter glass bottle. Rinse bottle with approximately 50 ml of sample and discard, fill bottle approximately 90% full with sample; add approximately 1-2 ml of HCl* (1-2 squirts with enclosed pipet), cap and invert 2-3 times; place on ice.

2. TOC (Total organic carbon): Use 120 ml amber glass bottles. Add approximately 1 ml H_2SO_4** (1 squirt with enclosed pipet) to empty bottle, add sample until bottle is completely filled (no head space) cap and invert bottle, if air bubble exist reopen and add more sample. Store on ice. Note: Teflon (shiny) side of cap septa faces sample and white dull side faces up.

3. TOX (Total organic halides): 120 ml amber glass bottles. Add a few drops (5) of 1M sodium sulfite and 1 ml (1 squirt) of HNO_3*** to the empty bottle; add sample until bottle is completely filled (no head space) cap and invert bottle; if air bubble exists, reopen and add more sample. Store on ice. Note: Teflon (shiny) side of cap septa faces samples and white dull side faces up (U.S. EPA, 1982c).

4. Phenol: Use 1 liter amber glass bottle. Rinse bottle with approximately 50 ml of sample and discard; fill bottle greater than 3/4 full; add 2 ml (2 squirts) of H_3PO_4**** and approximately 1 gram of cupric sulfate powder.

   Method for Cupric Sulfate Addition

   - using spatula, add cupric sulfate to line on vial (measuring vessel)
   - add to Phenol sample container
   * Note: do not breath or come into contact with cupric sulfate.

   Cap and invert bottle 2-3 time to mix, store on ice.

5. Metals: Use 1 liter plastic (LPE) bottle. Fill bottle approximately 3/4 with sample, and 2 ml (1 squirt) of HNO_3. Cap and invert 2-3 times; store on ice.

* HCl = Hydrochloric Acid
** H_2SO_4 = Sulfuric Acid
*** HNO_3 = Nitric Acid
**** H_3PO_4 = Phosphoric Acid
***** NaOH = Sodium Hydroxide

6. Volatile organics (VOA): Use 4-40 ml clear (small) jars (VOA vials) with teflon septa. Add sample until bottle is completely filled (no head space). Cap and invert bottle; if air bubble exists, reopen and add more sample. Store on ice. Note: Teflon (shiny) side of cap septa faces sample.

7. Cyanide: Use 1 liter plastic (LPE) bottle. Rinse bottle with approximately 50 ml of sample and discard; fill bottle greater than 3/4 full and add 2 ml (2 squirts) of 10N NaOH***** cap and invert 2-3 times; place on ice.

8. Organics: (includes B/N/A, Pesticide, PCB): Use 1 gallon amber bottles with teflon liners. Rinse bottle with approximately 50 ml of sample and discard. Fill bottle 90% full with sample and cap. Store on ice.

SEDIMENT/SOILS

1. TOX (Total organic halides): 40 ml clear (small) jars (vials). Fill 2 vials with homogeneous sediment sample, cap and store on ice. Note: Teflon (shiny) side down toward sample.

2. VOA (Volatile organics): 40 ml clear (small jars (VOA vials)). Fill 4 vials with homogeneous sediment sample, cap and store on ice. Note: Teflon (shiny) side faces sample.

3. All other solid parameters are collected in 2-32 oz. wide mouth jars. Fill as full as possible, pour off any excess H_2O.

Chain of Custody:

Every sample should have a SAIC label attached and filled out. List all samples and any comments on enclosed shipping record forms. Keep original (White) copy and send remaining copies with samples. Tape ice chest shut and initial tape seam.

* HCl = Hydrochloric Acid
** H_2SO_4 = Sulfuric Acid
*** HNO_3 = Nitric Acid
**** H_3PO_4 = Phosphoric Acid
***** NaOH = Sodium Hydroxide

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. Dock 1
VOA'S 3

CONSIGNEE

Name

No., Street

City, State, Zip

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
	4/24	1300					X	X									X		X					X					
							X	X									X		X					X		NO PHASE SEP			
			0				X	X									X		X					X					
								X											X					X					
								X											X					X					
							X	X									X		X					X					
	Total No. Containers																												

SHIPPING CHAIN OF CUSTODY

SAI Relinquished (Sign)	Date	Time	Received By (Sign)	Date	Time	Received By Courier (Sign)	Date	Time
Shipping Method	**Shipped By (Sign)**		**Courier From Aircraft (Sign)**	**Date**	**Time**	**Received By Contract Lab (Sign)**	**Date**	**Time**
				12-1	1015		12 DEC	6:5

White SAI Canary Lab Representative Pink Contract Lab Goldenrod Lab Returns to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No

CONSIGNEE

Name

No., Street

City, State, Zip

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS			Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
							X		X								X		X		X	X						
							X		X																		
							X		X																		
							X		X																		
							X		X								X		X		X	X						
							X		X								X		X		X	X						

Relinquished By (Sign) | Date | Time | Received By (Sign) | Date | Time | Received By Courier (Sign) | Date | Time

Courier From Airport (Sign) | Date | Time | Received By Testing Lab (Sign) | Date | Time

White: SAI Canary: Lab Representative Pink: Contract Lab Goldenrod: Lab Returns to SAI

SAIC
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: Dover 3

CONSIGNEE

Name: [illegible]

No., Street: [illegible]

City, State, Zip: [illegible]

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Phenols	TOC	~~BOD~~ TOX	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
[illegible]	12/4	8Q	[illegible]	MW003 AT D-10 [illegible]					X								X	X	X	X					X				
[illegible]	12/4	[illegible]	4	MW014 AT FT-1					X										X	X					X				
[illegible]	12/4	0935	4	MW015 AT FT-1					X										X	X					X				
[illegible]	12/4	[illegible]	4	MW016 AT FT-1					X										X	X					X				
[illegible] 7	12/4	1000	4	MW017 AT FT-1					X										X	X					X				
[illegible]	12/4	1025	6	MW007 AT D-10					X								X	X	X	X					X				
[illegible]	12/4	1250	6	MW006 AT D-10					X								X	X	X	X					X				[illegible]
[illegible] 7	12/4	1310	6	MW007 AT D10					X								X	X	X	X					X				
[illegible] 8	12/4	1400	6	MW008 AT D10					X								X	X	X	X					X				
[illegible]	[illegible]	1400	[illegible]	[illegible]					X								X	X	X	X					X				
[illegible] 7	[illegible]	1400	[illegible]	[illegible]					X								X	X	X	X					X				

Total No. Containers: 18

SHIPPING CHAIN OF CUSTODY

SAI Shipper (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible]								

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
Federal Express		162669834			[signature] for M Backe	12/6/84	1045 hrs

White: SAI · Canary: Lab Representative · Pink: Contract Lab · Goldenrod: Lab Return to SAI

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

SAMPLE SHIPPING RECORD

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. 4

CONSIGNEE

Name: [illegible]

No. Street: [illegible]

City, State, Zip: [illegible]

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	TOX	TOC	~~BOD~~	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
[illegible]	[illegible]	915	2	[illegible]															X						X				
[illegible]	12/6	[illegible]	2	[illegible]															X						X				
[illegible]	12/6	[illegible]	2	[illegible]															X						X				[illegible]
[illegible]	12/6	0950	2	[illegible]															X						X				[illegible]
[illegible]	12/6	1015	10				X		X							X	X	X	X						X				
[illegible]	12/6	[illegible]	10				X		X							X	X	X	X						X				
[illegible]	12/6	[illegible]	10				X		X							X	X	X	X						X				
[illegible]	12/6	[illegible]	10				X		X							X	X	X	X						X				[illegible]
[illegible]	12/6	1400	10				X		X							X	X	X	X						X				[illegible]
[illegible]	12/6	[illegible]	10				X		X							X	X	X	X						X				[illegible]
[illegible]	12/6	[illegible]	10				X		X							X	X	X	X						X				
[illegible]	12/6	[illegible]	10				X		X							X	X	X	X						X				
[illegible]	12/6	[illegible]	10				X		X							X	X	X	X						X				[illegible]
	Total No. Containers		[illegible]																										

3 COOLERS TO TMR

SHIPPING CHAIN OF CUSTODY

SAI Staff (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible]	12/6/84							
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	Fed Ex					DEEA for M Becker	12/[illegible]	1100

[illegible] Lab Representative [illegible] Contract Lab Returns to SAI

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: Dover 5

CONSIGNEE

Name: ED TOMASZEWSKI — JRB

No., Street: 8100 WESTPARK DRIVE

City, State, Zip: MCLEAN VA 22102

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Dioxins	Cyanide	TOX	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
SW003	12/7	0745	6	SW 3 FROM LOWER MILL				X	X						X	X	X	X	X						X				
SW004	12/7	0915	6	SW 4 FROM " "				X	X						X	X	X	X	X						X				METALS NOT ARRIVED
SW005	12/7	1025	6	SW 5 " " "				X	X						X	X	X	X	X						X				
SW006	12/7	1130	6	SW 6 " " "				X	X						X	X	X	X	X						X				
SW007	12/7	0940	6	SW 7 " " "				X	X						X	X	X	X	X						X				
SW008	12/7	0850	6	SW 8 " " "				X	X						X	X	X	X	X						X				
QA11	12/7	0850	6	QA				X	X						X	X	X	X	X						X				
	Total No. Containers		42																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
	12/7	1422						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
			B. Prindle	12-10	1100	Michael R. Bailey	12/10	1100hr

White: SAI Canary: Lab Representative Pink: Contract Lab Goldenrod: Lab Returns • SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No: Dover 6

CONSIGNEE

Name: [illegible] - JRB
No., Street: [illegible] DRIVE
City, State, Zip: [illegible] VA 22102

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	PCB	Phenols	Cyanide	TOX	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
[illegible]	[illegible]	[illegible]	1	[illegible]			X		X								X	X							X			
[illegible]	[illegible]	[illegible]	4	[illegible]					X								X	X							X			
[illegible]	[illegible]	[illegible]	4	[illegible]					X								X	X							X			
[illegible]	[illegible]	[illegible]	11	[illegible]			X		X						X	X	X	X	X						X			
[illegible]	[illegible]	[illegible]	11	[illegible]			X		X						X	X	X	X	X						X			
[illegible]	[illegible]	[illegible]	11	[illegible]			X		X						X	X	X	X	X						X			
[illegible]	[illegible]	[illegible]	2	[illegible]															X						X			
[illegible]	[illegible]	[illegible]	2	[illegible]															X						X			
[illegible]	[illegible]	[illegible]	2	[illegible]															X						X			
[illegible]	[illegible]	[illegible]	11	[illegible]			X		X						X	X	X	X	X						X			
[illegible]	[illegible]	[illegible]	11	[illegible]			X		X						X	X	X	X	X						X			
[illegible]	[illegible]	[illegible]	11	[illegible]			X		X						X	X	X	X	X						X			
							✓		✓						✓	✓	✓	✓	✓						✓			
	Total No. Containers		64																									

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible]								
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
			B. PINCUS	12-12-84	1100	[illegible]	12/12/84	1100

White: SAI Canary: Lab Representative Pink: Contract Lab Goldenrod: Lab Returns to SAI

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: Dover 7

CONSIGNEE

Name: C D TOKARSKI

No., Street: 8400 WEST PARK DR.

City, State, Zip: MCLEAN VA 22102

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Cyanide	TOC	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
SW-001	12/12	1100	10				X		X						X	X	X	X								KNOWN
SW002	12/12	1100	10				X		X						X	X	X	X								HIGH
SD001	12/12	1200	8				X		X						X	X	X	X								DUP
SD002	12/12	1200	8				X		X						X	X	X	X								
SH 15	12/12	1200	10				X		X						X	X	X	X								DUPLICATE
SH 16	12/12	1200	10				X		X						X	X	X	X								4
SH-17	12/12	1200	8				X		X						X	X	X	X								METHOD
	Total No Containers		64																							

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible]								
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	Fed Ex		B. PRUSIN	12-13-84	1200	[signature]	12/13/84	1200

White: SAI [illegible]

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: 1 Dover 8

CONSIGNEE

Name: [illegible] HOWARSKI - JR3

No. Street: 3400 WEST PARK DR.

City, State, Zip: [illegible] VA 22102

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Remarks
[illegible]	12/12	1300	4	FT-3 SIKEAM	
[illegible]	12/12	1630	4	FT-3 SIKEAM	TOX analyses not req'd
[illegible]	12/12	1600	4	FT-3 SIKEAM	
[illegible]	12/12	1530	4	FT-3 SIKEAM	
[illegible]	12/12	1700	4	FT-3 Sed/SWO1	
[illegible]	12/12	1630	4	FT-3 Sed/SWO12	
[illegible]	12/12	1600	4	FT-3 Sed/SWO13	
[illegible]	12/12	1500	4	FT-3 Sed/SWO14	
	Total No Containers				

Ext. Organics; Surv. Ext. Organics; Vol. Organics; Surv. Vol. Organics; Trace Metals; Other Inorganics; Pesticides; Herbicides; LMWHC; HMWHC; Radionuclides; Drugs; Cyanide; PH 7.5; TOC; BOD; TSS; VSS; DOC; POC; Oil and Grease; Lipids; Part. Size Dis.; Sediment Core Date

SHIPPING CHAIN OF CUSTODY

SAIC By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible]	12/14/12	1400						

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	Fed X	B. PALMER	12/14	1100	Michael K. Burke	12/14	1100hrs

White: SAI Canary: Lab Representative Pink: Contract Lab Goldenrod: Lab Returns to SAI

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: Dover 9

CONSIGNEE

Name: EDWARDS KI / JRB ASSOCIATES

No., Street: 2420 WESTPARK DR

City, State, Zip: MCLEAN VA 22102

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Dioxin	Grain Size	Toxicity	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
[illegible]	[illegible]	[illegible]	4	SEDIMENT SAMPLE					X							X	X	X	X										
WCC7	4/20/[illegible]	[illegible] 42	4	SEDIMENT SAMPLE					X							X	X	X	X										
[illegible]	4/20/84	[illegible] 42	4	SEDIMENT SAMPLE					X							X	X	X	X										
SD065	4/20/84	1242	4	SEDIMENT SAMPLE					X							X	X	X	X										
[illegible]004	4/20/84	1242	4	SEDIMENT SAMPLE					X							X	X	X	X										
SD003	4/20/84	1242	4	SEDIMENT SAMPLE					X							X	X	X	X										
	Total No Containers																												

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	Fed X	B. PHILBIN	12-14	1100	Michael K. Bartlett	12/14	1100hrs

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. DOVER-10

CONSIGNEE

Name: [illegible]

No., Street: [illegible]

City, State, Zip: [illegible]

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext Organics	Surv Ext. Organics	Vol Organics	Surv Vol Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
[illegible]	[illegible]	[illegible]	4	[illegible]					X										X	X					X				
[illegible]	[illegible]	[illegible]	4	[illegible]					X										X	X					X				
[illegible]	[illegible]	[illegible]	4	[illegible]					X										X	X					X				
[illegible]	[illegible]	[illegible]	4	[illegible]					X										X	X					X				
[illegible]	[illegible]	[illegible]	4	[illegible]					X										X	X					X				
[illegible]	[illegible]	1000	4	[illegible]					X										X	X					X				
[illegible]	[illegible]	[illegible]	4	[illegible]					X										X	X					X				
[illegible]	[illegible]	[illegible]	4	[illegible]					X										X	X					X				
[illegible]	[illegible]	[illegible]	4	[illegible]					X										X	X					X				

Total No. Containers: 36

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible]	[illegible]	[illegible]						

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
		[signature]	12/15/84	957	[signature] for M Beckel	12/18	0900 hr

White SAI   Canary Lab Representative   Pink Contract Lab   Goldenrod Lab Returns to SAI

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Dover

Shipment No: Dover 11

CONSIGNEE

Name

No., Street

City, State, Zip

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surr. Ext. Organics	Vol. Organics	Surr. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
		1300			X																								
		1300				X																							
	Total No Containers																												

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
			W I Pinkerton	1-10-85	1070	Michael Burkett	1/10/85	1020

White: SAI Canary: Lab Represent... Pink: Contract Lab Goldenrod: Lab Returns to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No.

CONSIGNEE

Name

No., Street

City, State, Zip

SAMPLE ANALYSIS

Sample No	Sample Date	Packed ~~Time~~	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	~~PH~~	TOC	~~BOD~~	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
	Total No Containers																											

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Shipping Method	Shipped By (sign)		Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	Fed X					[illegible] Dor M Beck	12/15/87	0000h

White SAI Canary Lab Representative Pink Contract Lab Goldenrod Lab Returns to SAI

AT 1753

D-351

SAIC SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

SAMPLE SHIPPING RECORD

Shipment No ~~D-3~~ -

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: Analytech Inc.
No. Street: 30th St.
City, State, Zip: National City Ca.

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics 601-602	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
85-4544	12/5	1500	4	MW010			✓																						
4545	"	"	4	MW011			✓																						
4546	"	"	4	MW012			✓																						
4547	"	"	4	MW013			✓																						
4548	"	"	4	MW 021			✓																						
4549	"	"	4	MW 022			✓																						
4550	"	"	6	MW 023			✓																						
4551	"	"	4	QA1			✓																						
4552	"	"	4	QA2			✓																						
4553	"	"	3	QA3			✓																						
4554	"	"	4	QA4			✓																						
4555	"	"	4	QA5			✓																						
	Total No Containers		49																										

SHIPPING CHAIN OF CUSTODY

SAIC (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Doug Scott	12/5/84	1500						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
Car	DHB					X	12/5/84	

Analytical **Technologies,** Inc.
Corporate Offices:
225 W 30th Street
National City, CA 92050
619-477-4173

Chain of Custody Record

pg 1 1/2

PROJECT NO	PROJECT NAME
1753	Science Applications

SAMPLERS (Signature)

ATI #

STATION NUMBER	DATE	TIME	STATION LOCATION	General Inorganic	Metals	Nutrients	Oil & Grease	Cyanide	Organics	Solids-Inorganics	Volatile Organics	Fuel	Oil	Industrial Hygiene	OTHER	NUMBER OF CONTAINERS	REMARKS
1			85-4544 MW010								X						601 & 602
2			-4545 MW011								X						
3			-4546 MW012								X						
4			-4547 MW013								X						
5			-4548 MW021								X						
6			-4549 MW022								X						
7			-4550 MW023								X						
8			-4551 QA 1								X						
9			-4552 QA 2								X						
10			-4553 QA 3								X						

TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Original Signed	12/6/89 12:00 pm				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
METHOD OF SHIPMENT		SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

Form (00/82) 1

DISTRIBUTION: Original accompanies shipment. Copy to field files

AnalyticalTechnologies, Inc.
Corporate Offices:
225 W. 30th Street
National City, CA 92050
619-477-4173

Chain of Custody Record

Pg 1/2

PROJECT NO: 1753

PROJECT NAME: Science Applied

SAMPLERS: (Signature)

STATION NUMBER	DATE	TIME	STATION LOCATION	General Inorganic	Metals	Nutrients	Oil & Grease	Cyanide	Organics	Solids-Inorganics	Volatile Organics	Fuel	Oil	Industrial Hygiene	OTHER			NUMBER OF CONTAINERS	REMARKS
11			85-4554 QA 4								X								601 & 602
12			-4555 QA 5								X								" "
																		TOTAL NUMBER OF CONTAINERS	

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	12/6/84 12:00 pm				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
METHOD OF SHIPMENT:		SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

Form 000782-1

DISTRIBUTION: Original accompanies shipment. Copy to field files

AT # 1772

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

SAMPLE SHIPPING RECORD

Shipment No: D851 - 5

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: Analytical Technic

No., Street: [illegible]

City, State, Zip: Novato Calif.

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics 601-602	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4820	12/11	1300	4	MW001			✓																						
4821			4	MW002			✓																						
4831			4	MW004			✓																						
4832			4	MW101			✓																						
4833			4	MW102			✓																						
4834			4	MW103			✓																						
4835			4	QA1			✓																						
4836			4	QA2			✓																						
4837			4	QA10			✓																						
4838	✓	✓	1	CA-84-0484			✓																						
	Total No Containers		37																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[signature]	12/11	1?						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
[illegible]	[signature]					[signature]	12/11	145

Contract Lab Represent[illegible] — Contract Lab Returns to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 32038 • (714) 454-3811

Shipment No: 1

CONSIGNEE

Name

No. Street

City, State, Zip

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
[illegible]-5116	12/11	1030	4	H_2O			✓																						
[illegible]-5117	↓	↓	3	↓			✓																						
85-5118			4				✓																						
85-5119			4				✓																						
85-5120			4				✓																						
85-5121	↓	↓	3	↓			✓																						
85-5171			4	Sediment			✓																						
85-5172			4				✓																						
85-5173			4				✓																						
85-5174			4				✓																						
85-5175			4				✓																						
85-5176			4				✓																						
85-5177			4				✓																						
[illegible]-5587	↓	↓	4	↓			✓																						
54	Total No Containers		54																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
				12/20	1050			
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
						[signature]	12/20/84	1737

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

Shipment No

CONSIGNEE

Name

No Street

City State Zip

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
35-5388	12/11	0?	4	Sediment			✓																						
35-5389	↓	↓	4	↓			✓																						
35-5390	↓	↓	4	↓			✓																						

Total No Containers: 6

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
				12/28	1:50PM			

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
					[signature]	12/28/??	1751

White - SAI **Canary - Lab Representative** **Pink - Contract Lab** **Goldenrod - Lab Returns to SAI**

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

Shipment No: D D-351-1

lg 1 of 4

CONSIGNEE

Name: Laucks Testing Labs
No Street:
City State Zip:

attn: Jim Davis

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Ref	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4512	11/30		1	MW-023														✓											
4513	11/29		1	QA1														✓											
4514	〃		1	QA2														✓											
4515	〃		1	QA3														✓											
4516	11/30		1	QA4														✓											
4517	〃		1	QA5														✓											
~~4518~~	〃		1	~~Bailer Wash~~														✓				~~VSS~~							
~~4519~~	〃		1	~~Trip Blank~~														✓				~~VSS~~							
4520	11/29		1	MW-010													✓												
4521	〃		1	MW-011													✓												
4522	〃		1	MW-012													✓												
4523	11/30		1	MW-013													✓												
4524	〃		1	MW-021													✓												
4525	〃		1	MW-022													✓												

Total No Containers: ~~14~~ 12 WATERS

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By ~~Courier (sign)~~	Date	Time
Michael K Bechel	12/4	1500hrs	Federal Express	12/4	1500hrs			
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SAIC **SCIENCE APPLICATIONS INTERNATIONAL CORPORATION**

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: D-351-1

Pg 2 of 4

CONSIGNEE

Name: Laucks Testing & Labs

No. Street:

City, State, Zip:

Attn: Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surr. Ext. Organics	Vol. Organics	Surr. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	TOC	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
85-4506	11/29		1	mw-010													✓										
4507	"		1	mw-011													✓										
4508	"		1	mw-012													✓										
4509	11/30		1	mw-013													✓										
4510	"		1	mw-021													✓										
4511	"		1	mw-022													✓										
4526	"		1	mw-023												✓											
4527	11/29		1	QA1												✓											
4528	"		1	QA2												✓											
4529	"		1	QA3												✓											
4530	11/30		1	QA4												✓											
4531	"		1	QA5												✓											
4586	11/29		1	mw-010														✓									
4587	11/29		1	mw-012														✓									
	Total No. Containers		14	WATERS																							

Ext. Organics: Tox
TOC: Phenols

SHIPPING CHAIN OF CUSTODY

Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time	Received By ~~(courier sign)~~	Date	Time
Michael Beckel	11/4	1500	Federal Express	11/4	1500 hrs			
Shipping Method	Shipped By (sign)		Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time

Lab Responsible — Returned Lab Returns to SAI

SAIC **SCIENCE APPLICATIONS INTERNATIONAL CORPORATION**

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: D-351-1

Pg 3 of 4

CONSIGNEE

Name: Laucks Testing Labs

No. Street:

City, State, Zip:

attn Tim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4484	11/29		1	MW-010															✓										
4485	"		1	MW-011															✓										
4486	"		1	MW-012															✓										
4487	11/30		1	MW-013															✓										
4488	"		1	MW-021															✓										
4489	"		1	MW-022															✓										
4490	"		1	MW-023															✓										
4491	11/29		1	QA1															✓										
4492	"		1	QA 2															✓										
4493	"		1	QA 3															✓										
4494	11/30		1	QA 4															✓										
4495	"		1	QA 5															✓										
~~4496~~	"		1	Eric Wish															✓										ca
4497	"		1	Trish Blair															✓										ca
	Total No Containers		19 (13)	WATERS																									

SHIPPING CHAIN OF CUSTODY

SAI Rel (sign)	Date	Time	Received By (sign)	Date	Time	Received By ~~Courier (sign)~~	Date	Time
M. Becker	12/4	1500h	Federal Express	12/4	1500h			
Shipping Method	Shipped By (sign)		Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: D-351-1

Pg 4 of 4

CONSIGNEE

Name: Laucks Testing Labs

No., Street:

City, State, Zip:

Attn: Jim Divers

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	~~Metals~~	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
85-4588	11/29		1	MW-013															✓										
4589	11/30		1	MW-021															✓										
4590	"		1	MW-022															✓										
4591	"		1	MW-023															✓										
4592	11/30		1	QA1															✓										
4593	11/29		1	QA2															✓										
4594	11/29		1	QA3															✓										
4595	11/30		1	QA4															✓										
4596	11/30		1	QA5															✓										
	Total No. Containers		9	WATERS																									

SHIPPING / CHAIN OF CUSTODY

SAIC (sign)	Date	Time	Received By (sign)	Date	Time	Received By ~~Courier (sign)~~	Date	Time
Michael Burkett	12/4	1500hrs	Fed. Express	12/4	1500hrs			
Shipping Method	Shipped By (sign)		Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time

SAIC SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: D-351-2

pg 1 of 3

CONSIGNEE

Name: Laucks Testing Lab

No. Street:

City, State, Zip:

Attn. Jim Quarles

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	TOX	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4607	12/5/91	1400	1	MW005															✓										
4608			1	MW006															✓										
4609			1	MW007															✓										
4610			1	MW008															✓										
4611			1	MW009															✓										
4612			1	MW014															✓										
4613			1	MW015															✓										
4614			1	MW016															✓										
4615			1	MW017															✓										
4616			1	QA6															✓										
4617			1	QA7															✓										
4618			1	MW005													✓												
4619			1	MW006													✓												
4620			1	MW007													✓												
~~4621~~	Total No. Containers		14																										

SHIPPING CHAIN OF CUSTODY

Sampled By (Sign)	Date	Time	Received By (Sign)	Date	Time	Received By Courier (Sign)	Date	Time
Michael Beahl	12/5					Federal Express		
Shipping Method	**Shipped By (Sign)**		**Courier From Airport (Sign)**	**Date**	**Time**	**Received By Contract Lab (Sign)**	**Date**	**Time**
AB# 0169 27 7073								

SAIC **SCIENCE APPLICATIONS INTERNATIONAL CORPORATION**

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: D-351-2

Pg 2 of 3

CONSIGNEE

Name: Laucks Testing Lab

No. Street:

City, State, Zip:

Allen Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surr. Ext. Organics	Vol. Organics	Surr. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	~~Grease~~ TOX & Phenols	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
85-4621	10/5/84	1400	1	mw008												✓												
4622			1	mw009												✓												
4623			1	mw014												✓												
4624			1	mw015												✓												
4625			1	mw016												✓												
4626			1	mw017												✓												
4627			1	QA6												✓												
4628			1	QA7												✓												
4640			1	mw005													✓											
4641			1	mw004													✓											
4642			1	mw007													✓											
4643			1	mw008													✓											
4644			1	mw009													✓											
4645			1	QA6													✓											
	Total No. Containers		14																									

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign): Michael Burkhalter	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign): Federal Express	Date / Time
Shipping Method:	Shipped By (sign): AD# 0699227023		Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date / Time

Pg 1 of 3

SAMPLE SHIPPING RECORD

Shipment No: N-351-3

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

CONSIGNEE

Name: LAUCKS TESTING LAB
No. Street:
City State Zip:
Attn: JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	TOX	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4767	12/6	1500	1	MWP005															✓										Clgo WE
85-4768			1	MWP006															✓										
85-4769			1	MWP007															✓										
85-4770			1	MWP008															✓										
85-4771			1	MW001															✓										
85-4772			1	MW002															✓										
85-4773			1	MW004															✓										
85-4774			1	MW101															✓										
85-4775			1	MW102															✓										
85-4776			1	MW103															✓										
85-4777			1	QA8															✓										
85-4778			1	QA9															✓										
85-4779			1	QA10															✓										
85-4780			1	MW001																			✓						
	Sub Total No Containers		14																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
M. Beckel	12/10					FED EX	12/10	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	AGS# 024372110							

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SAIC SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: D-351-2

Pg 3 of 3

CONSIGNEE

Name: Laucks Testing Lab

No. Street:

City State Zip:

Attn: Jim Davis

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Org.	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	4A Phenols	Total CN-	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4646	12/5/84	1400	1	QA7														✓											
85-4647			1	mw 005															✓										
4648			1	mw 006															✓										
4649			1	mw 007															✓										
4650			1	mw 008															✓										
4651			1	mw 009															✓										
4652			1	QA6															✓										
4653			1	QA7															✓										

Relinquished By (Sign)	Date	Time	Received By (Sign)	Date	Time	Received By Courier (Sign)	Date	Time
Michael Baker						Federal Express		
Courier Airbill #			Courier From Airport (Sign)	Date	Time	Received By Contract Lab (Sign)	Date	Time
AB# 869 22 1073			—					

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

Page 2 OF 3

Shipment No: N-351-3

CONSIGNEE

Name: LAUCKS TESTING LAB

No. Street:

City State Zip:

ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	~~BOC~~ TOX	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4781	10/6	1000	1	MW 002																			✓						Agua
85-4782			1	MW 004																			✓						
85-4783			1	MW 101																			✓						
85-4784			1	MW 102																			✓						
85-4785			1	MW 103																			✓						
85-4786			1	QA 8																			✓						
85-4787			1	QA 9																			✓						
85-4788			1	QA 10																			✓						
85-4789			1	MW001													✓												
85-4790			1	MW002													✓												
85-4791			1	MW004													✓												
85-4792			1	MW 101													✓												
85-4793			1	MW 102													✓												
85-4794			1	MW 103													✓												
SUB	Total No. Containers		14																										

SHIPPING CHAIN OF CUSTODY

Relinquished By (Sign)	Date	Time	Received By (Sign)	Date	Time	Received By Courier (Sign)	Date	Time
M. Buhl	12/10					FEDEX	12/10	1500
Shipping Method	**Shipped By (Sign)**		**Courier From Airport (Sign)**	**Date**	**Time**	**Received By Contract Lab (Sign)**	**Date**	**Time**
	AIRBILL # 0245724 10							

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

Shipment No
N-351-3

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

SAMPLE SHIPPING RECORD

CONSIGNEE

Name: LAUCKS TESTING LAB

ATTN: JIM OWENS

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. of Containers	Sample Description	Ext Organics	Surv Ext Organics	Vol Organics	Surv Vol Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Phenols	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part Size Dis	Sediment Core Date	Remarks
85-4795	12/6	1500	1	QA 8													✓												Aqu
85-4796			1	QA 9													✓												
85-4797			1	QA 10													✓												
85-4820			1	MW001														✓											
85-4821			1	MW002														✓											
85-4822			1	MW004														✓											
85-4823			1	MW101														✓											
85-4824			1	MW102														✓											
85-4825			1	MW103														✓											
85-4826			1	QA 8														✓											
85-4827			1	QA 9														✓											
85-4828			1	QA 10														✓											
Subtotal			12																										

Relinquished By (Signature)	Date	Time	Received By (Signature)	Date	Time
M. Sakal	12/10		FED EX	12/10	1500
Relinquished By (Signature)	Date	Time	Received By Contract Lab (Signature)	Date	Time

AIRBILL# 024372110

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No. D357-6

pg 1 of 3

CONSIGNEE

Name: Lancks Testing

No. Street:

City, State, Zip:

Attn: Jim Owen

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	~~[struck]~~ Phenol	~~[struck]~~ Cyanide	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
4935	12/11	1400	1	SW003													✓												
4938			1	SW004													✓												
4939			1	SW005													✓												
4940			1	SW006													✓												
4941			1	SW007													✓												
4942			1	SW008													✓												
4943			1	QA11													✓												
4951			1	SW003															✓										
4952			1	SW004															✓										
4953			1	SW005															✓										
4954			1	SW006															✓										
4955			1	SW007															✓										
4956			1	SW008															✓										
4957			1	QA11															✓										
	Total No. Containers		14																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Barber	12/11/84					Fed Ex	12/11/84	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
Airbill # 2432221574								

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

Shipment No: D-357-6

pg 2 of 2

CONSIGNEE

Name: Laucks Testing
No. Street:
City, State, Zip:

Attn: Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	#	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
4964	12/11	1400	1	SW003													✓												
4965			1	SW004													✓												
4966			1	SW005													✓												
4967			1	SW006													✓												
4968			1	SW007													✓												
4969			1	SW008													✓												
4970			1	QA11													✓												
4971			1	SW003															✓										
4972			1	SW004															✓										
4973			1	SW005															✓										
4974			1	SW006															✓										
4975			1	SW007															✓										
4976			1	SW008															✓										
4977			1	QA11															✓										
		Total No. Containers	14																										

SHIPPING CHAIN OF CUSTODY

SAI Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkett	12/11/-11					FedEx	12/12/11	1530
Shipping Method	Shipped By (sign)		Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	Airbill # 343121547							

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

Pg. 1 OF 2

SAMPLE SHIPPING RECORD

Shipment No: D-551-8

DOVER 7

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB

No. Street:

City, State, Zip:

ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	PHENOLS	TOC	TOX	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-5185	12/12	1500	1	SW001													✓												H20 ✓
85-5186			1	SW002													✓												✓
85-5187			1	QA-15													✓												✓
85-5188			1	QA-16													✓												✓
85-5189			1	SW001													■	✓											✓
85-5190			1	SW002													■	✓											✓
85-5191			1	QA-15													■	✓											✓
85-5192			1	QA-16													■	✓											✓
85-5197			1	SW-001															✓										✓
85-5198			1	SW-002															✓										✓
85-5199			1	QA-15															✓										✓
85-5200			1	QA-16															✓										✓
85-5201			1	SW-001																✓									✓
85-5202			1	SW002																✓									✓
SUB	Total No Containers		14																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkel	12/17	1600				FED EX	12/17	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	AIRBILL # 02437212							

White SAI Canary Lab Representative Pink Contract Lab Goldenrod Lab Returns to SAI

Pg. 2 OF 2

Shipment No D-351-8

Dover ?

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456 2791

CONSIGNEE

Name: LAUCKS TESTING LAB

No Street:

City State Zip:

ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext Organics	Surv Ext Organics	Vol Organics	Surv Vol Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	TOX	TSS	VSS	OD	POC	Oil and Grease	Lipids	Part Size Dis	Sediment Core Date	Remarks
85-5203	12/12	1300	1	QA-15																✓									H2O
85-5204	↓	↓	1	QA-16																✓									" ✓
85-5205	↓	↓	#2	SD-1																✓									SEDIMENT
85-5206	↓	↓	#2	SD-2																✓									" ✓
85-5207	↓	↓	#2	QA-17																✓									" ✓

SUB TOTAL: 8

Sampled by	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burke	12/17	1600				FED EX	12/17	1800
Airbill # 024372121			Courier From Airport (sign)			Received By Contract Lab (sign)		

White SAI Canary Lab Representative Pink Contract Lab Goldenrod Lab Returns to SAI

1 OF 3

SAMPLE SHIPPING RECORD

Shipment No: D-351-8

(DUPLICATE)

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB
No. Street:
City, State, Zip:

ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Cyanide	pH	TOC	TOX	TSS	Remarks
85-5089	12/11	1300	1	MW024	✓					H20
85-5090			1	MW025	✓					✓
85-5091			1	MW027	✓					✓
85-5092			1	QA-12	✓					✓
85-5093			1	QA-13	✓					✓
85-5094			1	QA-14	✓					✓
85-5107			1	MW018			✓			✓
85-5108			1	MW019			✓			✓
85-5109			1	MW020			✓			✓
85-5110			1	MW024			✓			✓
85-5111			1	MW025			✓			✓
85-5112			1	MW027			✓			✓
85-5113			1	QA-12			✓			✓
85-5114			1	QA-13			✓			✓
SUB	Total No Containers		14							

SHIPPING CHAIN OF CUSTODY

Relinquished By (Sampler)	Date	Time	Received By (Lab)	Date	Time	Received By (Courier Lab)	Date	Time
Michael Pierce	12/11/1600					FED EX		

2 OF 3

SAMPLE SHIPPING RECORD

Shipment No: D-3518

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB
No. Street:
City, State, Zip:

ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Sur. Ext. Organics	Vol. Organics	Sur. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	# Phenols	TOC	TOX	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-5115	12/11	1300	1	QA-14															✓	✓									H_2O
85-5122			1	MW018															✓										1
85-5123			1	MW019															✓										1
85-5124			1	MW020															✓										1
85-5125			1	MW024															✓										1
85-5126			1	MW025															✓										1
85-5127			1	MW027															✓										1
85-5128			1	MWP001															✓										1
85-5129			1	MWP002															✓										1
85-5130			1	MWP003															✓										1
85-5131			1	QA-12															✓										1
85-5132			1	QA-13															✓										1
85-5133			1	QA-14															✓										1
85-5143			1	MW024														✓											1

SUB

Total No. Containers:

SHIPPING CHAIN OF CUSTODY

Sampled By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Bailey	12/11	2000				FED EX	12/12	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
AIRBILL # 02437212/								

White: SAI Canary: Lab Representative Pink: Contract Lab Goldenrod: Lab Returns to SAI

3 of 3

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. D-357-8

CONSIGNEE

Name: LAUCKS TESTING LAB

No., Street:

City, State, Zip:

ATTN: JIM OWENS

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Phenols	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-5144	10/11	1800	1	MW 025														✓											H2O ✓
85-5145	"	"	1	MW027														✓											" ✓
85-5146	"	"	1	QA-12														✓											" ✓
85-5147	"	"	1	QA-13														✓											" ✓
85-5148	"	"	1	QA-14														✓											" ✓

5 ea Total No. Containers: 5

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible signature]	12/17	1600				FED EX	12/17	1500

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	AIR BILL # 02437212						

White SAI   Canary Lab Representative   Pink Contract Lab   Goldenrod Lab Returns to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No: D-351-9

POWER 8

CONSIGNEE

Name: LAUCKS TESTING LAB
No. Street:
City, State, Zip:

ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext Organics	Surr Ext Organics	Vol Organics	Surr Vol Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	CMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	TOX	TSS	VSS	BOD	COD	Oil and Grease	Solids	Part Size Dis.	Sediment Core Date	Remarks
85-5281	12/12	1400	2	SD003																✓									Sediment
85-5282			2	SD005 004																✓									
85-5283			2	SD-006 005																✓									
85-5284			2	SD-007 006																✓									
85-5285			1	SD-008 007																✓									
85-5286			2	SD-9 008																✓									
85-5287			2	SD-10 9																✓									
85-5288			2	SD-11 10																✓									
85-5289			1	SD-12 11																✓									
85-5290			2	SD-12																✓									
85-5338			2	SW SD-011															✓										Water
85-5339			2	SW SD-012															✓										
85-5340			2	SW SD-013															✓										
85-5341	✓	✓	2	SW-014															✓										
	SUB		26																										

Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time
Michael Tuck	12/12/1600		FED EX	12/17	1530
Courier Name	Courier Co.	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	ABRU * 0243 72121						

White: SAI Canary: Lab Representative Pink: Contract Lab Goldenrod: Lab Returns to SAI

Pg 1 OF 2

SAMPLE SHIPPING RECORD

Shipment No: D-351-10

DOVER 10

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: Lawler Testing Lab
No. Street:
City, State, Zip:

attn Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Perchlorate	Cyanide	pH	TOC	Grain Size	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-5342	12/12	1500	1														✓												Water
85-5343			1														✓												
85-5344			1													✓													
85-5345			1													✓													
85-5346			2	2 VIALS PER ✱															✓										Sediment
85-5347			2																✓										
85-5348			2																✓										
85-5349			2																✓										
85-5350			2																✓										
85-5351			2																✓										
85-5352			2																✓										
85-5353			2																✓										
85-5354			2																✓										
85-5355	✓	✓	2																✓										
SUB	Total No Containers		24																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkett	12/7	1600				FED EX	12/7	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
AIRBILL #024372121								

White SAI Canary Lab Representative Pink Contract Lab Goldenrod Lab Returns to SAI

Pg 2 of 2

SAMPLE SHIPPING RECORD

Shipment No: D-351-10

COVERED

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456 2791

CONSIGNEE

Name: Jacobs Testing Lab attn: Jim Owens

No., Street:

City, State, Zip:

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext Organics	Surr Ext Organics	Vol Organics	Surr Vol Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	TSS	VSS	DOC	BOD	Oil & Grease	Spirits	Part Size Dis	Sediment Core Date	Remarks
85-5356	12/12	1400	2	2 per Sample *															✓	✓								Sediment
85-5357			2																✓	✓								
85-5358			2																✓	✓								
85-5359			1																✓									Water
85-5360			1																✓									
85-5361			1																✓									
85-5362			1																✓									
85-5363			1																✓									
85-5364			1																✓									
85-5365			1																✓									
85-5366			1																✓									
85-5367			1																✓									
85-5368	✓	✓																	✓									
	SUB Total for Subcontract		16																									

SHIPPING CHAIN OF CUSTODY

Relinquished By (Sampler)	Date	Time	Received By (Lab)	Date	Time	Received By Courier (Lab)	Date	Time
Michael Bachel	12/7	1600				Fed Ex	12/7	1500
Shipping Method: AIRBILL	Shipping Bill No.: 8243721 21		Courier From Airport (Lab)	Date	Time	Received By Contract Lab (Lab)	Date	Time

White SAI Canary Lab Representative Pink Contract Lab Goldenrod Lab Returns to SAI

Pg 1 of 2

SAMPLE SHIPPING RECORD

Shipment No. D-351-11

Dwer-7-8-9-10

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: Laucks Testing Lab

No., Street:

City, State, Zip:

attn: Jim Owens

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Phenols	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-5208	12/12	1300	1	SD-1													✓	✓	✓										Sediment
85-5209	〃	〃	1	SD-2													✓	✓	✓										〃
85-5210	〃	〃	1	QA-17													✓	✓	✓										〃
85-5218	12/12	1000	1	SD009															✓										〃
85-5219	〃	〃	1	SD010															✓										〃
85-5220	〃	〃	1	SD011															✓										〃
85-5221	〃	〃	1	SD012															✓										〃
85-5291	12/12	1300	1	SD003													✓	✓	✓										〃
85-5292	〃	〃	1	SD004													✓	✓	✓										〃
85-5293	〃	〃	1	SD005													✓	✓	✓										〃
85-5294	〃	〃	1	SD006													✓	✓	✓										〃
85-5295	〃	〃	1	SD007													✓	✓	✓										〃
85-5296	〃	〃	1	SD008													✓	✓	✓										〃
85-5385	12/14	1300	1	SD-17															✓										〃
508	Total No Containers		14																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Bechel	12/20	3:30				Federal Express	12/20	1330
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	Fed Ex							

White SAI Canary Lab Representative Pink Contract Lab Goldenrod Lab Returns to SAI

Pg 2 of 2

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No: D-351-11

CONSIGNEE

Name: Laucks Testing Lab

No., Street:

City State Zip:

attn Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	~~...~~ Phenol	Cyanide	TOC	Remarks
85-5386	12/14	1300	1	SD-19			✓	Sediment
85-5391	12/13	1300	1	SL-13	✓	✓	✓	↓
85-5392	↓	↓	1	SL-14	✓	✓	✓	↓
85-5393	↓	↓	1	SL-15	✓	✓	✓	↓
85-5394	↓	↓	1	SL-16	✓	✓	✓	↓
85-5395	↓	↓	1	QA-20			✓	↓
85-5396	↓	↓	1	SD-020			✓	↓
85-5397	↓	↓	1	SD-021			✓	↓
85-5398	↓	↓	1	SD-022			✓	↓
85-5399	↓	↓	1	SD-023			✓	↓
85-5400	↓	↓	1	SD-024			✓	↓
85-5401	↓	↓	1	SD-025			✓	↓
85-5402	↓	↓	1	SD-026			✓	↓
85-5403	↓	↓	1	SD-027			✓	↓
			14					

Per Claudia Wingard 11/25/85, CN- + phenol to be analyzed for on these 4 samples. I called + informed J. Owens at Laucks on 11/26/85 of this change. [initials]

Initials: JJB

Packed By: Michael Bechtel — Date: 12/20 — Time: 1420 — 3:30

Shipping Method: Air Bill*

Received By: Federal Express — Date: 12/20 — Time: 1330

Received By Contract Lab: — Date: — Time:

White SAI   Canary Lab Representative   Pink Contract Lab   Goldenrod Lab Returns to SAI

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-8811

SAMPLE SHIPPING RECORD

Shipment No: D-351-13

CONSIGNEE

Name: Lucke Testing Lab
No., Street:
City, State, Zip:

atth Jim Owens.

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Remarks
85-5687	1/16/85	1400	1		
5688	1/16/85	1400	1		
			Total No Containers: 2		

SAMPLE ANALYSIS

Sample No.	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganic	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	~~pH~~ EP Tox.	TOC	~~BOD~~ IGNITABILITY	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date
85-5687																✓								
5688														✓										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael K. Bush						Fed Express		
Shipping Method / Shipped By (sign)			Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
ABill 024 372 460								

White - SAI **Canary - Lab Representative** **Pink - Contract Lab** **Goldenrod - Lab Returns to SAI**

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. Doue 1
VOA O-3

CONSIGNEE
Name: Ed. Tokarski / JRB
No., Street: 8400 Westpark Dr
City, State, Zip: McLean VA 2210[illegible]

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surr. Ext. Organics	Vol. Organics	Surr. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	[illegible]	Remarks
MW010	11/29	1300	10	MW-10 AT SITE 4 - GROUND WATER			X		X								X		X						X		PHENOLS, TOX
MW011	11/29	1350	10	MW-11 AT SITE 4 - GW			X		X								X		X						X	NO P[illegible] CW	PHENOLS TOX
MW012	11/29	1110	10	MW-12 AT SITE 4 GW			X		X								X		X						X		PHENOLS, TOX
QA 1	11/29	1500	10	QA			X		X								X		X						X		PHENOLS TOX
QA 2	11/29	[illegible]	10	QA			X		X								X		X						X		PHENOLS TOX
QA 3	11/29	1500	10	QA			X		X								X		X						X		PHENOLS TOX

Vol. Organics: 601/602

2 COOLERS TOTAL

Total No. Containers:

* METALS: ARSENIC, CADMIUM, CHROMIUM (TOTAL), COPPER, IRON, LEAD, MERCURY, NICKEL, SILVER, ZI[illegible]

SHIPPING CHAIN OF CUSTODY

SAI by (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[signature]	11/29	1630						

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
		[signature]	12-1	1015	[signature]	12 01	0[illegible]5

White SAI   Canary Lab Representative   Pink Contract Lab   Goldenrod Lab Return to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No.: Dow 52

CONSIGNEE

Name: ED TOKARSKI
No., Street: 8400 WESTPARK DR
City, State, Zip: MCLEAN VA 22102

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics 601-602	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS			Oil		Remarks
MW013	11/30	1000	10	SITE 4 - MW013 - GW			X		X								X	X			X			X		VERY STRONG SWOC
MW023	11/30	1045	10	SITE 5 MW023 - GW			X		X								X	X			X			X		
QC - 4	11/30	1100	10	QA			X		X								X	X			X			X		
MW022	11/30	1130	10	SITE 5 MW022 - GW			X		X								X	X			X			X		
MW021	11/30	1230	10	SITE 5 MW021 - GW			X		X								X	X			X			X		
QC 5	11/30	1300	10	QA			X		X								X	X			X			X		

2 Coolers total

Total No. Containers

SHIPPING CHAIN OF CUSTODY

SAI (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
FEDEX			12/1	1015		12/1	1015

White: SAI Canary: Lab Representative Pink: Contract Lab Blue: [illegible]

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: Dover 3

CONSIGNEE

Name: ED TOKARSKI - TAS
No. Street: 3400 WEST PARK DR
City State Zip: MCLEAN VA 22102

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext Organics	Surv Ext Organics	Vol Organics	Surv Vol Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMW HC	HMW HC	Radionuclides	Drugs	Cyanide	Phenols	TOC	TOX	TSS	VSS	BOD	COD	Oil & Grease	Date	Remarks
MW05	12/4	1300	6	MW05 AT D-10-GW					X								X	X	X	X				X	X		
MW14	12/1	0945	4	MW14 AT FT-1					X										X	X				X	X		
MW15	12/2	1335	4	MW15 AT FT-1					X										X	X				X	X		
MW16	12/4	0915	4	MW16 AT FT-1					X										X	X				X	X		
MW17	12/4	1000	4	MW17 AT FT-1					X										X	X				X	X		
MW009	12/4	1615	6	MW009 AT D-10					X								X	X	X	X				X	X		
MW006	12/4	1250	6	MW006 AT D-10					X								X	X	X	X				X	X		
MW007	12/4	1310	6	MW007 AT D-10					X								X	X	X	X				X	X		
MW008	12/4	1400	6	MW008 AT D-10					X								X	X	X	X				X	X		
QA-6	12/1	1400	6	QA					X								X	X	X	X				X	X		
TB-1	12/1	1400	6	QA					X								X	X	X	X				X	X		
		Total No. Containers	18																								

SHIPPING CHAIN OF CUSTODY

Sampler (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[signature]	12/4	1800						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
Fed. Express	1626098314					[signature] for M Baker	12/5/84	1045

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No.

Sub Mission, U-5

CONSIGNEE

Name: EP TOKARSKI – IRB
No., Street: 8100 WESTPARK DR
City, State, Zip: MCLEAN VA 22102

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Dioxin/Furans	Explosives	TOC	Phenolics	TSS	VSS	DOC	POC	TOX	Grain Size Dist.	Remarks
MWP05	12/6	~~0815~~ 0815	2	GW, WYCOFF MWP5			X	X										X					X			
MWP06	12/6	0825	2	" " " MWP6			X	X										X					X			
MWP07	12/6	0930	2	" " " MWP7			X	X										X					X			HEAVY FUELS SMELL IN HC
MWP08	12/6	~~0950~~ 0950	2	" " " MWP8			X	X										X					X			HEAVY FUELS SMELL IN HC
MW001	12/6	1015	10				X	X										X					X			
MW002	12/6	1100	10				X	X										X					X			
MW004	12/6	1130	10				X	X										X					X			
MW101	12/6	1400	10				X	X										X					X			KNOWN HIGH FUELS ORGANIC
MW102	12/6	1500	10				X	X										X					X			KNOWN HIGH FUELS ORGANIC
MW103	12/6	1530	10				X	X										X					X			KNOWN HIGH FUELS ORG
QA 8	12/6	0825	10				X	X										X					X			
QA 9	12/6	0825	10				X	X										X					X			
QA10	12/6	1130	10				X	X										X					X			POSSIBLE HIGH FUELS ORGANIC
		Total No. Containers	98																							

3 coolers to TRC

SHIPPING CHAIN OF CUSTODY

Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
E Tokarski	12/6/87							
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
Fed Ex						DRH for M Beckel	12/8/87	1100hr

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. Dover 5

Sub DS1 6

CONSIGNEE

Name: ED TOMASKI – JRB
No., Street: 8400 WESTPARK DRIVE
City, State, Zip: MCLEAN VA 22101

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Cyanide	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Remarks
SW003	12/7	1040	6	SW FROM NORTH DITCH					X						X	X	X							METALS NOT ARCHIVED
SW004	12/7	1015	6	SW4 FROM " 4					X						X	X	X							
SW005	12/7	1000	6	SW5 " " "					X						X	X	X							
SW006	12/7	0930	6	SW6 " " "					X						X	X	X							
SW007	12/7	0910	6	SW7 " " "					X						X	X	X							
SW008	12/7	0850	6	SW8 " " "					X						X	X	X							
QA11	12/7	0800	6	QA					X						X	X	X							
	X																							
	X																							
	X																							
	X																							
	Total No. Containers X		42																					

SHIPPING/CHAIN OF CUSTODY

SW Shipped By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[signature]	12/7	1300						

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	X	B. Pmeau	12-10	1100	Michael P. Bailey	12/10	1100

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. Dover 6

351-8

CONSIGNEE

Name: ED TOKARSKI - JR

No., Street: 8400 WESTPARK Dr

City, State, Zip: MCLEAN VA 2210[illegible]

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Chlor. PHENOLS	Cyanide	TOX	TOC	BOD	TSS	VSS	DOC	FOC	Oil & Grease	Remarks
MW 018	12/11	0900	4	GW FROM FT-3					X									X	X						X	
MW 019	12/11	0940	4	GW " FT-3					X									X	X						X	
MW 020	12/11	1000	4	GW " FT-3					X									X	X						X	
MW 024	12/11	1030	11	GW " S-1			X		X					X	X	X		X	X						X	
MW 025	12/11	1100	11	GW " S-1			X		X					X	X	X		X	X						X	
MW 027	12/11	1130	11	GW " S-1			X		X					X	X	X		X	X						X	
MWP 001	12/11	1320	2	GW "															X						X	
MWP 002	12/11	1330	2	GW "															X						X	
MWP 003	12/11	1400	2	GW "															X						X	
QA-12	12/11	0830	11	QA			X		X					X	X	X		X	X						X	
QA-13	12/11	0830	11	QA			X		X					X	X	X		X	X						X	
QA-14	12/11	1430	11	QA			X		X					X	X	X		X	X						X	
	Total No. Containers		84																							

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
X	12/11/89	1500						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
			B. Pmuair	12-12-89	1100	R. Buckley	12/12/89	1100

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No. Dover 7

Fig - 857-1, Tex 357-2

CONSIGNEE

Name: ED TOKARSKI
No., Street: 8400 WEST PARK DR.
City, State, Zip: MCLEAN, VA 22102

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Base Organics	Cyanide	Fuel Hydrocarbons	TOC	Phenol	TSS	VSS	DOC	POC	Grain Size	Bore Data	Remarks
SW-001	12/12	1100	10				X		X						X	X	X	X	X								KNOWN
SW002	12/12	1200	10				X		X						X	X	X	X	X								HIGH
SD001	12/12	1200	8				X		X						X	X	X	X	X								CONC.
SD002	12/12	1200	8				X		X						X	X	X	X	X								OF
QA 15	12/12	1200	10				X		X						X	X	X	X	X								ORGANICS
QA-16	12/12	1200	10				X		X						X	X	X	X	X								&
QA-17	12/12	1200	8				X		X						X	X	X	X	X								METALS
	Total No. Containers		64																								

SHIPPING CHAIN OF CUSTODY

Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	Fed Ex		B. PRUSIN	12-13-84	1200		12/13/84	1200

Contract Lab Receipt

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No. 1 Dover 8

CONSIGNEE

Name: Ed TOKARSKI - JRB
No., Street: 8400 WEST PARK
City, State, Zip: MCLEAN VA

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Sed 357.9	TOC	Sed 357.9"	BOD	T&S	VSS	DOC	POC	Remarks
SW 01	12/12	1200	4	FT-3 STREAM					X									X	X	X						
SW 02	12/12	1630	4	FT-3 STREAM					X									X	X	X						TOX water not read
SW 03	12/12	1600	4	FT-3 STREAM					X									X	X	X						
SW 04	12/12	1530	4	FT-3 STREAM					X									X	X	X						
SD 01	12/12	1700	4	FT-3 Sed/SW01					X									X	X	X						
SD 02	12/12	1630	4	FT-3 Sed/SW02					X									X	X	X						
SD 03	12/12	1600	4	FT-3 Sed/SW03					X									X	X	X						
SD 04	12/12	1530	4	FT-3 Sed/SW04					X									X	X	X						
	Total No. Containers																									

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[signature]	12/13/88	1800						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	Fed X		B. Pittman	12/14	1600	[signature] Richard H. Burke	12/14	1100hrs

TSA – ...

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. Dover 9

CONSIGNEE

Name: ED TCHARSKI/JRB ASSOCIATES
No. Street: 8400 WESTPARK DR
City State Zip: MCLEAN, VA 22102

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv Ext. Organics	Vol Organics	Surv Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	[illegible] CU	[illegible] Metals	[illegible]	TOX	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	[illegible]	Sediment Core Date	Remarks
SD008	[illegible]	2:42	4	SEDIMENT SAMPLE					X						X	X	X	X	X										
SD007	12/4/84	2:42	4	SEDIMENT SAMPLE					X						X	X	X	X	X										
SD006	12/4/84	2:42	4	SEDIMENT SAMPLE					X						X	X	X	X	X										
SD065	12/3/84	2:42	4	SEDIMENT SAMPLE					X						X	X	X	X	X										
SD004	12/3/84	2:42	4	SEDIMENT SAMPLE					X						X	X	X	X	X										
SD003	12/3/84	2:42	4	SEDIMENT SAMPLE					X						X	X	X	X	X										

Total No. Containers

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible]	[illegible]	[illegible]						

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	Fed X	B. Phibin	12-14	1100	Michael K. Bechel	12/14	1100 hr

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No.: DOVER-10

CONSIGNEE

Name: LD TOKARSKI [redacted]
No., Street: 8100 WESTPARK [redacted]
City, State, Zip: DUBLIN OH [redacted]

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Remarks
SD020	12/14	1000	4	D-2 Sed	
SD020	12/14	1000	4	D-2	
SD021	12/14	1000	4	D-2	
SD022	12/14	1000	4	D-2	
SD023	12/14	1000	4	D-2	
SD024	12/14	1000	4	D-2	
SD025	12/14	1000	4	D-2	
SD026	12/14	1000	4	D-2	
SD027	12/14	1000	4	D-2	
	Total No. Containers		36		

Ext. Organics; Surr. Ext. Organics; Vol. Organics; Surr. Vol. Organics; Trace Metals; Other Inorganics; Pesticides; Herbicides; LMW HC; HMW HC; Radionuclides; Drugs; Cyanide; pH; TOC; 8081 PCB; TSS; VBS; DOC; POC; Oil and Grease; [redacted]

OC

SHIPPING CHAIN OF CUSTODY

SAI (sign) (sign)	Date	Time	Received By (sign)	Date	Received By Courier (sign)	Date	Time
[signature]	12/14	1200					
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Received By Contract Lab (sign)**	**Date**	**Time**
			[signature]	[redacted]	for M Beeks	12/19/90	0957

White: SAI Canary: Lab Representative Pink: Contract Lab Gold: Lab Return to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. [illegible]

CONSIGNEE

Name: [illegible] TRC
No., Street: [illegible]
City, State, Zip: [illegible]

SAMPLE ANALYSIS

Sample No.	Sample Date	Package Type	No. Cont.	Sample Description	Ext. Organics	Surr. Ext. Organics	Vol. Organics	Surr. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Phenolics	TOC	TCLP 35-10	TCLP 51-10	TSS	VSS	DOC	POC	Oil and Grease	Remarks
SW016	12/14	2	0900	XYZ WATER															X						X		
SW017	12/14	2	0900	XYZ SOIL															X						X		
SW019	12/14	2	0900	XYZ SOIL					X										X						X		
SW004	12/14	4	1000	FT 1 WATER					X										X						X		
SW010	12/14	4	1000	FT 1 WATER					X										X						X		
SW015	12/14	4	1000	FT 1					X										X						X		
SW019	12/14	4	1000	FT 1					X										X						X		
SW013B	12/14	3	1100	duplicate SOIL												X	X								X		Match pairs
SW001B	12/14	3	1100	" SOIL												X	X								X		
SW011B	12/14	1	1100	" SOIL																					X		
SW012B	12/14	1	1100	" SOIL																					X		
SW013B	12/14	1	1100	" SOIL																					X		
SW011B	12/14	1	1100	" SOIL																					X		
	Total No. Containers																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[illegible]	12/14	1412						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	Fed X					[illegible] for M Beck	12/15/87	0900 hr

Lab Remarks:

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Dover

Shipment No. Dover 11

CONSIGNEE

Name: ED TOKARSKI

No., Street: 8400 WESTPARK DR

City, State, Zip: MCLEAN VA 22102

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics (EP TOXICITY)	Surr. Ext. Organics (WATER…)	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	[illegible]	[illegible]	[illegible]	[illegible] Core Date	Remarks
DR-1	1/4/85	1300	2	DRUMMED CUTTINGS	X																								BOTH SA. DRUMMED CUTTINGS. ASSESS ORGANICS, EP TOXICITY, IGNITABILITY.
DR 1	1/4/85	1300	2	DRUMMED CUTTINGS		X																							

#00

OU

Total No. Containers: 4

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[signature]	1/9/85	1400						

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
		WL [illegible]	1-10-85	1070	[signature]	1/10/85	1070

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

AT 1753

D-351

Shipment No -3

CONSIGNEE

Name: Analytech Lab Inc.

No. Street: 30th St.

City, State, Zip: National City, Ca.

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics 01-02	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
85-4544	12/5	1500	4	MW010			✓																						
4545	"	"	4	MW01			✓																						
4546			4	MW012			✓																						
4547			4	MW013			✓																						
4548			4	MW 021			✓																						
4549			4	MW 022			✓																						
4550			6	MW 023			✓																						
4551			4	QA1			✓																						
4552			4	QA2			✓																						
4553			3	QA3			✓																						
4554			4	QA4			✓																						
4555	"	"	4	QA5			✓																						
		Total No. Containers	49																										

SHIPPING CHAIN OF CUSTODY

Sent By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Doug A. Smith	12/5/91	1500						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
Car	DHB					X	12/5/91	

Analytical Technologies, Inc.
Corporate Offices:
225 W. 30th Street
National City, CA 92050
619-477-4175

Chain of Custody Record

pg 1/2

PROJECT NO: 1753

PROJECT NAME: Science Applications

SAMPLERS: (Signature)

ATI #

STATION NUMBER	DATE	TIME	STATION LOCATION	General Inorganic	Metals	Nutrients	Oil & Grease	Cyanide	Organics	Solids-Inorganics	Volatile Organics	Fuel	Oil	Industrial Hygiene	OTHER	NUMBER OF CONTAINERS	REMARKS
1			85-4544 MW010								X						601 & 602
2			-4545 MW011								X						
3			-4546 MW012								X						
4			-4547 MW013								X						
5			-4548 MW021								X						
6			-4549 MW022								X						
7			-4550 MW023								X						
8			-4551 QA 1								X						
9			-4552 QA 2								X						
10			-4553 QA 3								X						

TOTAL NUMBER OF CONTAINERS

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Jennifer Rodrigues	12/4/89 12:00 pm				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
METHOD OF SHIPMENT:		SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

Form 000787 1

DISTRIBUTION: Original accompanies shipment. Copy to field files

Analytical Technologies, Inc.
Corporate Offices:
225 W. 30th Street
National City, CA 92050
619 477-4173

Chain of Custody Record

pg 2/2

PROJECT NO	PROJECT NAME
1753	Science Applied

SAMPLERS: (Signature)

STATION NUMBER	DATE	TIME	STATION LOCATION	General Inorganic	Metals	Nutrients	Oil & Grease	Cyanide	Organics	Solids-Inorganics	Volatile Organics	Fuel	Oil	Industrial Hygiene	OTHER			NUMBER OF CONTAINERS	REMARKS
11			85-4554 QA 4								X								601 & 602
12			-4555 QA 5								X								" "
																		TOTAL NUMBER OF CONTAINERS	

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	12/4/84 12:00 pm				
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
METHOD OF SHIPMENT		SHIPPED BY: (Signature)	COURIER: (Signature)	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

Form (FOOTB2-1)

DISTRIBUTION: Original accompanies shipment. Copy to field files

AT #7772

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No. D851-5

CONSIGNEE

Name: Analytical Tech Inc.

No. Street: 20th St.

City, State, Zip: Walnut Creek

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics 601-602	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Purgeable Halocarbons	Purgeable Aromatics	Sediment Core Data	Remarks
85-4829	12/11	1300	4	MW001			✓																						
4830			4	MW002			✓																						
4831			4	MW004			✓																						
4832			4	MW101			✓																						
4833			4	MW102			✓																						
4834			4	MW103			✓																						
4835			4	QA8			✓																						
4836			4	QA9			✓																						
4837			4	QA10			✓																						
4838	↓	↓	1	GP-84-0484			✓																						
	Total No. Containers		37																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Douglas Clarke	12/11	1300						
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
Car	DAC					K Mitchell Jones	12/11	1:45

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

Shipment No: D-351 12

CONSIGNEE

Name: Analytical Tech
No. Street:
City, State, Zip:

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics 601-60	Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	PCB	Oil & Grease	Part. Lab Dis	Sediment Co e Date	Remarks
85-5116	12/11	0930	4	H20			✓																					
85-5117			3				✓																					
85-5118			4				✓																					
85-5119			4				✓																					
85-5120			4				✓																					
85-5121			3				✓																					
85-5171			4	Sediment			✓																					
85-5172			4				✓																					
85-5173			4				✓																					
85-5174			4				✓																					
85-5175			4				✓																					
85-5176			4				✓																					
85-5177			4				✓																					
85-5587			4				✓																					
	Total No Containers		54																									

SHIPPING / CHAIN OF CUSTODY

Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
	12/13	1650	Joaquin S. Cano	12/13				
Shipping Method	Shipped By (sign)		Courier from Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
							12/13/85	1737

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

SAMPLE SHIPPING RECORD

Shipment No: D357-12

pg 2 of 2

CONSIGNEE

Name: Analytical Tech

No. Street:

City State Zip:

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics 601-624	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pestibides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	DIC	[illegible]	Part. [illegible]	Sediment Core Date	Remarks
85-5388	10/11	1000	4	Sediment			✓																						
85-5389	↓	↓	4	↓			✓																						
85-5390	↓	↓	4	↓			✓																						

Total No Containers: 6

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Received By Courier (sign)	Date	Time
[illegible] for MB	12/8	1650 hr	Joaquin S Cano			

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Received By Contract Lab (sign)	Date	Time
personal car			[illegible]	12/9/89	1157

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

Shipment No: D-351-1
Pg 1 of 4

CONSIGNEE

Name: Laucks Testing Labs
No. Street:
City, State, Zip:

attn: Jim Duxbury

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	[redacted]	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
85-4512	11/30		1	MW-023														✓											
4513	11/29		1	QA1														✓											
4514	"		1	QA2														✓											
4515	"		1	QA3														✓											
4516	11/30		1	QA4														✓											
4517	"		1	QA5														✓											
~~4518~~	"		1	~~Bailer Wash~~														✓				✓							
~~4519~~	"		1	~~Trip Blank~~														✓				✓							
4520	11/29		1	MW-010													✓												
4521	"		1	MW-011													✓												
4522	"		1	MW-012													✓												
4523	11/30		1	MW-013													✓												
4524	"		1	MW-021													✓												
4525	"		1	MW-022													✓												

Total No. Containers: ~~14~~ 12 WATERS

RECORD OF CHAIN OF CUSTODY

Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time	Received By ~~Courier (sign)~~	Date	Time
Michael K Beckel	12/4	1500	Federal Express	12/4	1500			
Shipped Via (Method)	Shipped By (sign)		Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No. D-351-1
Pg 2 of 4

CONSIGNEE
Name: Laucks Testing Labs
No., Street:
City, State, Zip:
Attn: Jim Owens

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	TOC	TSS	VSS	DOC	POC	Oil and Grease	Phenols	Part. Size Dist.	Sediment Core Date	Remarks
85-4506	11/29		1	MW-010													✓										
4507	"		1	MW-011													✓										
4508	"		1	MW-012													✓										
4509	11/30		1	MW-013													✓										
4510	"		1	MW-021													✓										
4511	"		1	MW-022													✓										
4526	"		1	MW-023												✓											
4527	11/29		1	QA1												✓											
4528	"		1	QA2												✓											
4529	"		1	QA3												✓											
4530	11/30		1	QA4												✓											
4531	"		1	QA5												✓											
4586	11/29		1	MW-010														✓									
4587	11/29		1	MW-012														✓									
	Total No. Containers		14	WATERS																							

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By ~~Courier (sign)~~	Date	Time
Michael Beckly	11/4	1500	Federal Express	11/4	[illegible]			
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

SAMPLE SHIPPING RECORD

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No: D-351-1
Pg 4 of 4

CONSIGNEE

Name: Laucks Testing Labs
No. Street:
City State Zip:

Attn: Jim Dwerlis

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD Phenols	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4588	11/29		1	MW-013															✓										
4589	11/30		1	MW-021															✓										
4590			1	MW-022															✓										
4591			1	MW-023															✓										
4592	11/30		1	QA1															✓										
4593	11/29		1	QA2															✓										
4594	11/29		1	QA3															✓										
4595	11/30		1	QA4															✓										
4596	11/30		1	QA5															✓										
	Total No. Containers		9	WATERS																									

SHIPPING CHAIN OF CUSTODY

Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time	Received By ~~Courier (sign)~~	Date	Time
Michael Burkett	12/4	1500hrs	Fed. Express	12/4	1500			
Shipping Method	Shipped By (sign)		Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No. D-351-1

Pg 3 of 4

CONSIGNEE

Name: Laucks Testing Labs

No., Street:

City, State, Zip:

Attn: Tina Owens

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part.-Size Dist.	Sediment Core Date	Remarks
85-4484	11/29		1	MW-010															✓										
4485	"		1	MW-011															✓										
4486	"		1	MW-012															✓										
4487	11/30		1	MW-013															✓										
4488	"		1	MW-021															✓										
4489	"		1	MW-022															✓										
4490	"		1	MW-023															✓										
4491	11/29		1	QA1															✓										
4492	"		1	QA 2															✓										
4493	"		1	QA3															✓										
4494	11/30		1	QA4															✓										
4495	"		1	QA5															✓										
~~4496~~	"		1	Rinsate Blank															✓										ca
~~4497~~	"		1	Field Blank															✓										ca
	Total No Containers		12	WATERS																									

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By ~~Courier (sign)~~	Date	Time
M. Buhl	12/4	1600	Federal Express	12/4	1600			
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: 0-351-2

Pg 1 of 3

CONSIGNEE

Name: Laucks Testing Lab

No. Street:

City, State, Zip:

Attn. Jim Dwelle

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext Organics	Surv Ext Organics	Vol Organics	Surv Vol Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	TOX	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
86-4607	12/5/86	1400	1	MW 005															✓										
4608			1	MW 006															✓										
4609			1	MW 007															✓										
4610			1	MW 008															✓										
4611			1	MW 009															✓										
4612			1	MW 014															✓										
4613			1	MW 015															✓										
4614			1	MW 016															✓										
4615			1	MW 017															✓										
4616			1	QA6															✓										
4617			1	QA7															✓										
4618			1	MW 005													✓												
4619			1	MW 006													✓												
4620			1	MW 007													✓												
~~4621~~	Total No. Containers		14																										

SHIPPING CHAIN OF CUSTODY

Sampled By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkel	12/5					Federal Express		
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	AB# 0169227073							

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: 0-351-2
Pg 2 of 3

CONSIGNEE

Name: Laucks Testing Lab
No., Street:
City, State, Zip:

Attn: Jim Dweik

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Organics TOX & Phenols	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dist.	Sediment Core Date	Remarks
85-4621	10/5/84	1400	1	MW008													✓											
4622	"	"	1	MW009													✓											
4623			1	MW014													✓											
4624			1	MW015													✓											
4625			1	MW016													✓											
4626			1	MW017													✓											
4627			1	QA6													✓											
4628			1	QA7													✓											
4640			1	MW005														✓										
4641			1	MW006														✓										
4642			1	MW007														✓										
4643			1	MW008														✓										
4644			1	MW009														✓										
4645	"	"	1	QA6														✓										
	Total No. Containers		14																									

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Buckley						Federal Express		
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
AR	AR 0169227023							

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No: D-351-2

Pg 3 of 3

CONSIGNEE

Name: Lawks Testing Lab
No. Street:
City, State, Zip:

Attn: Jim Oxsa

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Tot. Phenols	Free CN-	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis	Sediment Core Date	Remarks
85-4646	13/5/85	1400	1	QA7														✓											
85-4647	"	"	1	mw 005															✓										
4648	"	"	1	mw 006															✓										
4649	"	"	1	mw 007															✓										
4650	"	"	1	mw 008															✓										
4651	"	"	1	mw 009															✓										
4652	"	"	1	QA6															✓										
4653	"	"	1	QA7															✓										
		Total No. Containers																											

SHIPPING CHAIN OF CUSTODY

Sampled By (Sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Becker						Federal Express		
Shipping Method	**Shipped By (Sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	ABF 069 227073							

Pg 1 OF 3

SAMPLE SHIPPING RECORD

Shipment No: N-351-3 (N-351-1)

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

CONSIGNEE

Name: LAUCKS TESTING LAB
No Street:
City State Zip:
Attn: JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	TOX	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4767	12/6	1000	1	MWP005															✓										Aqua
85-4768	"	"	1	MWP006															✓										
85-4769			1	MWP007															✓										
85-4770			1	MWP008															✓										
85-4771			1	MW001															✓										
85-4772			1	MW002															✓										
85-4773			1	MW004															✓										
85-4774			1	MW101															✓										
85-4775			1	MW102															✓										
85-4776			1	MW103															✓										
85-4777			1	QA8															✓										
85-4778			1	QA9															✓										
85-4779			1	QA10															✓										
85-4780			1	MW001																			✓						
		Sub Total No Containers	14																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
M. Beckel	12/10					FED EX	12/10	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	Airbill # 024372110							

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

SAMPLE SHIPPING RECORD

PG 2 OF 3
Shipment No: N-351-3

CONSIGNEE
Name: LAUCKS TESTING LAB
No. Street:
City, State, Zip:
ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No.	Sample Date	Received Time	No. Containers	Sample Description	Ext Organics	Surv Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Meta's	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	BOD	TSS	VSS	BOC TOX	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4781	10/6	1000	1	MW 002																			✓						Aqueous
85-4782			1	MW 004																			✓						
85-4783			1	MW 101																			✓						
85-4784			1	MW 102																			✓						
85-4785			1	MW 103																			✓						
85-4786			1	QA 8																			✓						
85-4787			1	QA 9																			✓						
85-4788			1	QA 10																			✓						
85-4789			1	MW001													✓												
85-4790			1	MW002													✓												
85-4791			1	MW004													✓												
85-4792			1	MW 101													✓												
85-4793			1	MW 102													✓												
85-4794			1	MW103													✓												
	SUB	Total No. Containers	14																										

CHAIN OF CUSTODY

Relinquished By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
M. Buehl	12/10					FEDEX	12/10	1500
Relinquished By (sign)			Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
AFDM 0245 72410								

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

Pg 3 OF 3

SAMPLE SHIPPING RECORD

Shipment No: N-3543

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

CONSIGNEE

Name: LAUCKS TESTING LAB
No. Street:
City State Zip:
ATTN: JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Phenols	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-4795	1/6	1000	1	QA 8													✓												Aqu
85-4796			1	QA 9													✓												
85-4797			1	QA 10													✓												
85-4820			1	MW001														✓											
85-4821			1	MW002														✓											
85-4822			1	MW004														✓											
85-4823			1	MW101														✓											
85-4824			1	MW102														✓											
85-4825			1	MW103														✓											
85-4826			1	QA 8														✓											
85-4827			1	QA 9														✓											
85-4828			1	QA 10														✓											
SUB	Total No Containers		12																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
M. Bubel	12/10					FEDEX	12/10	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
AIRBILL 02437210								

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY

476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

SAMPLE SHIPPING RECORD

Shipment No. D357-6

pg 1 of 2

CONSIGNEE

Name: Laucks Testing

No., Street:

City, State, Zip:

Attn: Jim Owen

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Phenol / Cyanide	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dist.	Sediment Core Date	Remarks
4935	12/11	1400	1	SW003													✓											
4938			1	SW004													✓											
4939			1	SW005													✓											
4940			1	SW006													✓											
4941			1	SW007													✓											
4942			1	SW008													✓											
4943			1	QA/11													✓											
4951			1	SW003														✓										
4952			1	SW004														✓										
4953			1	SW005														✓										
4954			1	SW006														✓										
4955			1	SW007														✓										
4956			1	SW008														✓										
4957			1	QA/11														✓										
	Total No. Containers		14																									

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By (sign)	Date	Time
Michael Barker	12/11/84					Fed Ex	12/12/84	1530
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
Fed Ex	Fed Ex Bill # 2437215 4							

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

Shipment No: D-357-6

pg 2 of 2

CONSIGNEE

Name: Laucks Testing
No. Street:
City, State, Zip:

Attn Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	TOC	BOD	TSS	VSS	DOC	POC	Oil & Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85 4964	12/11	1400	1	SW003													✓											
4965			1	SW004													✓											
4966			1	SW005													✓											
4967			1	SW006													✓											
4968			1	SW007													✓											
4969			1	SW008													✓											
4970			1	QA11													✓											
4971			1	SW003														✓										
4972			1	SW004														✓										
4973			1	SW005														✓										
4974			1	SW006														✓										
4975			1	SW007														✓										
4976			1	SW008														✓										
4977			1	QA11														✓										
	Total No Containers		14																									

SHIPPING CHAIN OF CUSTODY

SAI (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkett	12/11/84					Fed Ex	12/11/84	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
Airbill #2437254								

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

Pg. 1 OF 2

SAMPLE SHIPPING RECORD

Shipment No: D-551-8

DOVER 7

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB

No. Street:

City, State, Zip:

ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surr. Ext. Organics	Vol. Organics	Surr. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LI WHC	HM WHC	Radionuclides	Drugs	Cyanide	PHENOLS	TOC	TOX	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dist.	Sediment Core Date	Remarks
85-5185	12/12	1500	1	SWC01													✓												H20
85-5186			1	SW002													✓												
85-5187			1	QA-15													✓												
85-5188			1	QA-16													✓												
85-5189			1	SW001													✓												
85-5190			1	SW002													✓												
85-5191			1	QA-15													✓												
85-5192			1	QA-16													✓												
85-5197			1	SW-001														✓											
85-5198			1	SW-002														✓											
85-5199			1	QA-15														✓											
85-5200			1	QA-16														✓											
85-5201			1	SW-001															✓										
85-5202	↓	↓	1	SW002															✓										
SUB TOTAL Containers			14																										

Relinquished By (Sign)	Date	Time	Received By (Sign)	Date	Time	Received By Courier (Sign)	Date	Time
Michael Pickel	12/12	1500				FED EX	12/17	1500
Relinquished By (Sign)	Date	Time	Received From Airport (Sign)	Date	Time	Received By Courier Lab (Sign)	Date	Time
Airbill # 027372021								

Lab Remarks:

Pg. 2 OF 2

SAMPLE SHIPPING RECORD

Shipment No: D-351-8

DOVER 7

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB

No., Street:

City, State, Zip:

ATTN: JIM OWENS

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Remarks
85-5203	12/12	1300	1	QA-15	H2O
85-5204	"	"	1	QA-16	"
85-5205	"	"	#2	SD-1	SEDIMENT
85-5206	"	"	#2	SD-2	"
85-5207	"	"	#2	QA-17	"
		Total No Containers	8		

Ext. Organics; Surr. Ext. Organics; Vol. Organics; Surr. Vol. Organics; Trace Metals; Other Inorganics; Pesticides; Herbicides; LMWHC; HMWHC; Radionuclides; Drugs; Cyanide; pH; TOC; TOX; TSS; VSS; DOC; POC; Oil and Grease; Lipids; Part. Size Dist.; Sediment Core Date

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkett	12/17	1600				FED EX	12/17	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
AIRBILL # 0243721 21								

White: SAI Canary: Lab Representative Pink: Contract Lab Goldenrod: Lab Returns to SAI

1 OF 3

SAMPLE SHIPPING RECORD

Shipment No: D-351-8 (DUPLICATE)

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB
No., Street:
City, State, Zip:

ATTN: JIM OWENS

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ex. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	TOX	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dist.	Sediment Core Date	Remarks
85-5089	12/11	1800	1	MW024													✓												H20
85-5090			1	MW025													✓												✓
85-5091			1	MW027													✓												✓
85-5092			1	QA-12													✓												✓
85-5093			1	QA-13													✓												✓
85-5094			1	QA-14													✓												✓
85-5107			1	MW018															✓										✓
85-5108			1	MW019															✓										✓
85-5109			1	MW020															✓										✓
85-5110			1	MW024															✓										✓
85-5111			1	MW025															✓										✓
85-5112			1	MW027															✓										✓
85-5113			1	QA-12															✓										✓
85-5114			1	QA-13															✓										✓
15	Total No. Containers		14																										

SHIPPING CHAIN OF CUSTODY

Sampled By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkett	12/17	1600				FED EX	12/17	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
AirBill # 024372121								

2 OF 3

SAMPLE SHIPPING RECORD

Shipment No. D-351-8

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB
ATTN. JIM OWENS
No., Street:
City, State, Zip:

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surr. Ext. Organics	Vol. Organics	Surr. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	* PRIORITY POLLUTANTS	TOC	* TOX	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dist.	Sediment Core Data	Remarks
85-5115	12/11	1800	1	QA-14															✓	✓									H_2O
85-5122			1	MW018															✓										
85-5123			1	MW019															✓										
85-5124			1	MW020															✓										
85-5125			1	MW024															✓										
85-5126			1	MW025															✓										
85-5127			1	MW027															✓										
85-5128			1	MWP001															✓										
85-5129			1	MWP002															✓										
85-5130			1	MWP003															✓										
85-5131			1	QA-12															✓										
85-5132			1	QA-13															✓										
85-5133			1	QA-14															✓										
85-5143			1	MW024														✓											
SUB	Total No Containers																												

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Bailey	12/11	1800				FED. EX	12/17	1800
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
AIRBILL # 02437212/								

3 OF 3

SAMPLE SHIPPING RECORD

Shipment No: D-3578

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB
ATTN: JIM OWENS
No., Street:
City, State, Zip:

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Remarks
85-5144	10/11	1600	1	MW 025	H_2O
85-5145			1	MW 027	
85-5146			1	QA-12	
85-5147			1	QA-13	
85-5148			1	QA-14	
	Total No. Containers		5		

Analyses: Ext. Organics; Surv. Ext. Organics; Vol. Organics; Surv. Vol. Organics; Trace Metals; Other Inorganics; Pesticides; Herbicides; LMWHC; HMWHC; Radionuclides; Drugs; Cyanide; TOC; BOD; TSS; VSS; DOC; FOC; Oil and Grease; Lipids; Part. Size Dis.; Sediment Core Data

SHIPPING CHAIN OF CUSTODY

SAI Rel'd (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
[signature]	10/17	1600				FED EX	10/17	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
AIR BILL # 0243 7212 1								

SAMPLE SHIPPING RECORD

Shipment No. D-351-9

POWER

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: LAUCKS TESTING LAB

No. Street:

City, State, Zip:

ATTN. JIM OWENS

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	~~COD~~ TOX	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dist.	Sediment Core Date	Remarks
85-5281	12/2	1400	2	SD003															✓										Sediment
85-5282			2	SD005 004															✓										
85-5283			2	SD-~~006~~ 005															✓										
85-5284			2	SD-~~007~~ 006															✓										
85-5285			1	SD-~~008~~ 007															✓										
85-5286			2	SD-~~9~~ 008															✓										
85-5287			2	SD-~~10~~ 9															✓										
85-5288			2	SD-~~11~~ 10															✓										
85-5289			1	SD-~~12~~ 11															✓										
85-5290			2	SD-12															✓										
85-5338			2	SW SD-011														✓											Water
85-5339			2	SW SD-012														✓											
85-5340			2	SW SD-013														✓											
85-5341	✓	✓	2	SW-014														✓											
	~~3~~ 2	Total No Containers	26																										

SHIPPING CHAIN OF CUSTODY

Sampler (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burke	12/7	1600				FED EX	12/7	1530
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	ARB# 024372121							

Witness SAI Courier Lab Representative Back Contract Lab Contract Lab Representative SAI

Pg 1 OF 2

SAMPLE SHIPPING RECORD

Shipment No. D-857-10

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

DOVER ID

CONSIGNEE

Name: Jacobs Testing Lab
No., Street:
City, State, Zip:

att: Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surr. Ext. Organics	Vol. Organics	Surr. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Perchlorate	Cyanide	pH	TOC	Bulk Dens	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dist.	Sediment Core Data	Remarks
85-5342	11/17	1500	1														✓											Water
85-5343			1														✓											
85-5344			1												✓													
85-5345			1												✓													
85-5346			2	2 VIALS PER *															✓									Sediment
85-5347			2																✓									
85-5348			2																✓									
85-5349			2																✓									
85-5350			2																✓									
85-5351			2																✓									
85-5352			2																✓									
85-5353			2																✓									
85-5354			2																✓									
85-5355			2																✓									
SUB	Total No. Containers		24																									

* Lab Remove

SHIPPING CHAIN OF CUSTODY

Sampled By (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkett	11/17	1600				FED EX	12/17	1500

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	AIRBILL #024372121						

Pg 2 of 2

SAMPLE SHIPPING RECORD

Shipment No. D-351-10

DOVER

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: Jauco Testing Lab attn: Jim Owens

No., Street:

City, State, Zip:

SAMPLE ANALYSIS

Sample No.	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	pH	TOC	TOX	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dist.	Sediment Core Data	Remarks
85-5356	12/7	1500	2	2 per Sample															✓										Sediment
85-5357			2																✓										
85-5358			2																✓										
85-5359			1															✓											Water
85-5360			1															✓											
85-5361			1															✓											
85-5362			1															✓											
85-5363			1															✓											
85-5364			1															✓											
85-5365			1																✓										
85-5366			1																✓										
85-5367			1																✓										
85-5368	✓	✓																	✓										
		Total No Containers	16																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Burkhart	12/7	1600				Fed Ex	12/7	1500
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	AirBill # 2437212 1							

Pg 1 of 2

SAMPLE SHIPPING RECORD

Shipment No. D-351-11

Dover-7-8-9-10

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

CONSIGNEE

Name: Laucks Testing Lab

No., Street:

City, State, Zip:

attn Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	Asbestos	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-5208	12/12	1800	1	SD-1													✓	✓	✓										Sediment
85-5209	〃	〃	1	SD-2													✓	✓	✓										
85-5210	〃	〃	1	QA-17													✓	✓	✓										
85-5218	12/12	1000	1	SD009															✓										
85-5219	〃	〃	1	SD010															✓										
85-5220	〃	〃	1	SD011															✓										
85-5221	〃	〃	1	SD012															✓										
85-5291	12/12	1800	1	SD003													✓	✓	✓										
85-5292	〃	〃	1	SD004													✓	✓	✓										
85-5293	〃	〃	1	SD005													✓	✓	✓										
85-5294	〃	〃	1	SD006													✓	✓	✓										
85-5295	〃	〃	1	SD007													✓	✓	✓										
85-5296	〃	〃	1	SD008													✓	✓	✓										
85-5385	12/14	1300	1	SD-17															✓										
508	Total No Containers		14																										

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Bechel	12/20	3:30				Jim Owens	12/20	1830
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Date**	**Time**	**Received By Contract Lab (sign)**	**Date**	**Time**
	R.C. Bill*							

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY & GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (714) 454-3811

Shipment No. D-351-13

CONSIGNEE

Name: Lovelace Testing Lab
att. Jim Owens
No. Street:
City, State, Zip:

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No. Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol. Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	Drugs	Cyanide	++ EP Tox.	TOC	COD	TSS	VSS	DOC	POC	Sediment Core Data	Remarks
85-5687	4/16/85	1400	1																✓	ISOTAB						
5688	4/16/85	1400	1																							

Total No. Containers: 2

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Received By Courier (sign)	Date	Time
Michael K. Burke				Fed Express		
Shipping Method	**Shipped By (sign)**		**Courier From Airport (sign)**	**Received By Contract Lab (sign)**	**Date**	**Time**
FED EX 372460						

White - SAI Canary - Lab Representative Pink - Contract Lab Goldenrod - Lab Returns to SAI

Pg 2 OF 2

SAMPLE SHIPPING RECORD

SCIENCE APPLICATIONS, INC.
DIVISION OF ENVIRONMENTAL CHEMISTRY AND GEOCHEMISTRY
476 PROSPECT STREET, LA JOLLA, CA 92038 • (619) 456-2791

Shipment No. D-351-11

CONSIGNEE

Name: Laucks Testing Lab

No., Street:

City, State, Zip:

attn: Jim Owens

SAMPLE ANALYSIS

Sample No	Sample Date	Packed Time	No Containers	Sample Description	Ext. Organics	Surv. Ext. Organics	Vol Organics	Surv. Vol. Organics	Trace Metals	Other Inorganics	Pesticides	Herbicides	LMWHC	HMWHC	Radionuclides	~~[illegible]~~ Pheno	Cyanide	pH	TOC	BOD	TSS	VSS	DOC	POC	Oil and Grease	Lipids	Part. Size Dis.	Sediment Core Date	Remarks
85-5386	12/14	1300	1	SD-19															✓										Sediment
85-5391	12/13	1300	1	SL-13												✓	✓		✓										
85-5392			1	SL-14												✓	✓		✓										
85-5393			1	SL-15												✓	✓		✓										
85-5394			1	SL-16												✓	✓		✓										
85-5395			1	QA-20															✓										
85-5396			1	SD-020															✓										
85-5397			1	SD-021															✓										
85-5398			1	SD-022															✓										
85-5399			1	SD-023															✓										
85-5400			1	SD-024															✓										
85-5401			1	SD-025															✓										
85-5402			1	SD-026															✓										
85-5403			1	SD-027															✓										
[illegible]	Total No. Containers		14																										

Per Claudia Wingate 11/25/85, CN⁻ + phenol to be analyzed for on these 4 samples. I called + informed J. Owens at Laucks on 11/23/85 of this change. [initials]

SHIPPING CHAIN OF CUSTODY

SAI (by) (sign)	Date	Time	Received By (sign)	Date	Time	Received By Courier (sign)	Date	Time
Michael Bechel	12/20	3:30				Federal Express	12/20	1330

Shipping Method	Shipped By (sign)	Courier From Airport (sign)	Date	Time	Received By Contract Lab (sign)	Date	Time
	Air Bill						

APPENDIX H: Analytical Results

QUALITY CONTROL SUMMARY

Submitted To:	Edward Tokarski
Project Number:	2-895-06-182-56 Dover Air Force Base
Date Samples Received:	December 4, 1984 through January 16, 1985
Date Samples Extracted:	Oil and Grease samples in water were extracted within 24 hours of sample receipt. Samples for EP Toxicity and Oil and Grease, both in soils extracted within 2 weeks of sample receipt.
Date Samples Analyzed:	December 5, 1984 through February 14, 1985
Methodologies Employed:	Purgable Halocarbons - Water: EPA Method 601; Soil: EPA Method SW 846 Purgable Aromatics - Water: EPA Method 602; Soil: EPA Method 846 Oil and Grease - EPA Method 413.2 - Water Extracted by SW 846 analyzed by 413.2 in soil Polychlorinated Biphenols - Water: EPA Method 608; Soil: EPA Method SW 846 Phenols - EPA Method 420.1 Cyanide - EPA Method 412 Total Organic Carbon - EPA Method 415.1 Total Organic Halogen - EPA Method SW 846-9020 EP Toxicity - 40 CFR 261.24 Ignitability - 40 CFR 261.21 Metals - 8 As - EPA Method 206.2 Cd - EPA Method 213.1/213.2 Cr - EPA Method 218.1/218.2 Cu - EPA Method 220.1/220.2 Fe - EPA Method 236.1/236.2 Pb - EPA Method 239.1/239.2 Hg - EPA Method 245.1/245.5 Ni - EPA Method 249.1/249.2 Ag - EPA Method 272.1/272.2 Zn - EPA Method 289.1/289.2
Sample Quality Control:	See attached table and narrative

SAIC

APPENDIX H

The Sample Quality Control Report Table shows the values obtained from quality control procedures which are described as follows:

For PCBs

Because variability is high between spike recoveries for PCB samples, one sample is not considered representative of the set. Therefore, for all PCB samples (media and QA samples), independent QC was performed with the PCB recoveries shown in Attachment A to the table.

For Metals

Random samples were selected from which three replicates, or aliquots, of each sample were analyzed. Analytical results of the aliquots, shown under the heading "Replicates" in the table, demonstrate generally low variance between aliquot concentrations which are reported in ug/l. Since the analyses for metals are nondestructive, the "Spike Value" used was the average of the three replicate concentrations. To the spike value samples, high and low spike concentrations of each metal were added. Percent recoveries were very good, indicating good quality control. The high and low spike levels used allowed for bracketing of the detection limits, or demonstration of a good operating range for the instrument.

For TOC, TOX, Cyanide, and Phenol

The same methodology described for metals above was applied. However, only two replicates or aliquots were analyzed, and because some of these tests are destructive, the "Spike Value" used to determine recoveries was from another randomly selected sample. The spike levels added to the samples again were selected to demonstrate good operation of equipment at or above detection limits. All values are expressed in mg/l. The percent recoveries are very good for all analytes except TOX, indicating good quality control. The low spike recoveries for TOX are not uncommon in laboratory analyses.

For Oil and Grease

No methodology for spike recovery quality control is considered accurate for this parameter. Instead standard (linear regression) curves were developed as shown in Attachment B to the table, to which sample analyses could be compared. The standard curves for the IR spectra are plotted with absorbence on the y-axis and concentrations in ppm on the x-axis, and the correlation coefficients demonstrate the validity of the curves. Also shown in Attachment B are the infrared spectrophotometry results for concentrations in 100 and 10 mm cells.

QUALITY CONTROL REPORT 1

DOVER AFB

Parameter	Replicate	Blank	Spike Value	Spike Level	Recovery %
PCBs	21/26-Percent Recoveries	0		see attachment A	20-79%-Water 32-73%-Soil
Ag	<0.050/<0.050/<0.050	0			
As	<2.50/<2.50/<2.50	0	<2.50	7.44 low 27.9 high	149-low 112-high
Cd	<0.050/<0.050/<0.050	0	<0.050	5.12 low 25.0 high	102-low 100-high
Cr	<0.020/<0.020/<0.020	0	<0.020	25.1 high	115 low 101 high
Cu	1.69/1.61/1.91	0	1.74	5.71 low 26.6 high	114 low 106 high
Fe	27.4/36.5	0	32.0	33.8 high	135 high
Hg	9.75/2.88/9.50	0	7.38	17.02 low 25.41 high	113 low 102 high
Ni	<2.00/<2.00/<2.00	0	<2.00	4.49 low 26.1 high	90 low 104 high
Pb	7.09/5.12/7.39	0	6.53	4.60 low 27.9 high	92 low 112 high
Zn	1.50/1.66/2.30	0	1.82	3.84 low 24.1 high	77 low 97 high
VOCs		0		see attached	91-140
Oil & Grease	insufficient sample to conduct replicates	0		linear regression	see attachment B

QUALITY CONTROL REPORT 2

DOVER AFB

Parameter	Replicate	Percent Difference	Method Spike Value	Spike Level	Recovery %
CN	0.006/0.009	40	0.056	0.050	112
	0.053/0.055	4	0.053	0.050	106
	0.056/0.060	7	0.053	0.050	106
	<0.005/<0.005	0	0.056	0.050	112
	<0.005/<0.005	0			
	<0.005/<0.005	0			
Phenol	0.050/0.049	2	0.050	0.050	100
	0.052/0.053	2	0.052	0.050	104
	0.053/0.066	22	0.066	0.050	100
	0.050/0.050	0	0.050	0.050	100
	0.049/0.048	2	0.049	0.050	98
	9.4/9.3	1	9.4	6.2	100
TOC	24/23	4	26	10	100
	20/20	0	23	10	110
	6.2/6.8	9	15	10	103
	3.0/2.9	3			
	29/31	7			
	1.3/1.4	4			
	0.4/0.4	0			
	0.3/0.3	0			
	0.3/0.4	3			
	1.3/1.6	21			
	4.4/4.7	7			
	1.6/1.5	6			
TOX	0.025/0.025	0	0.048	0.050	44
	0.075/0.073	3			
	0.33/0.37	11			

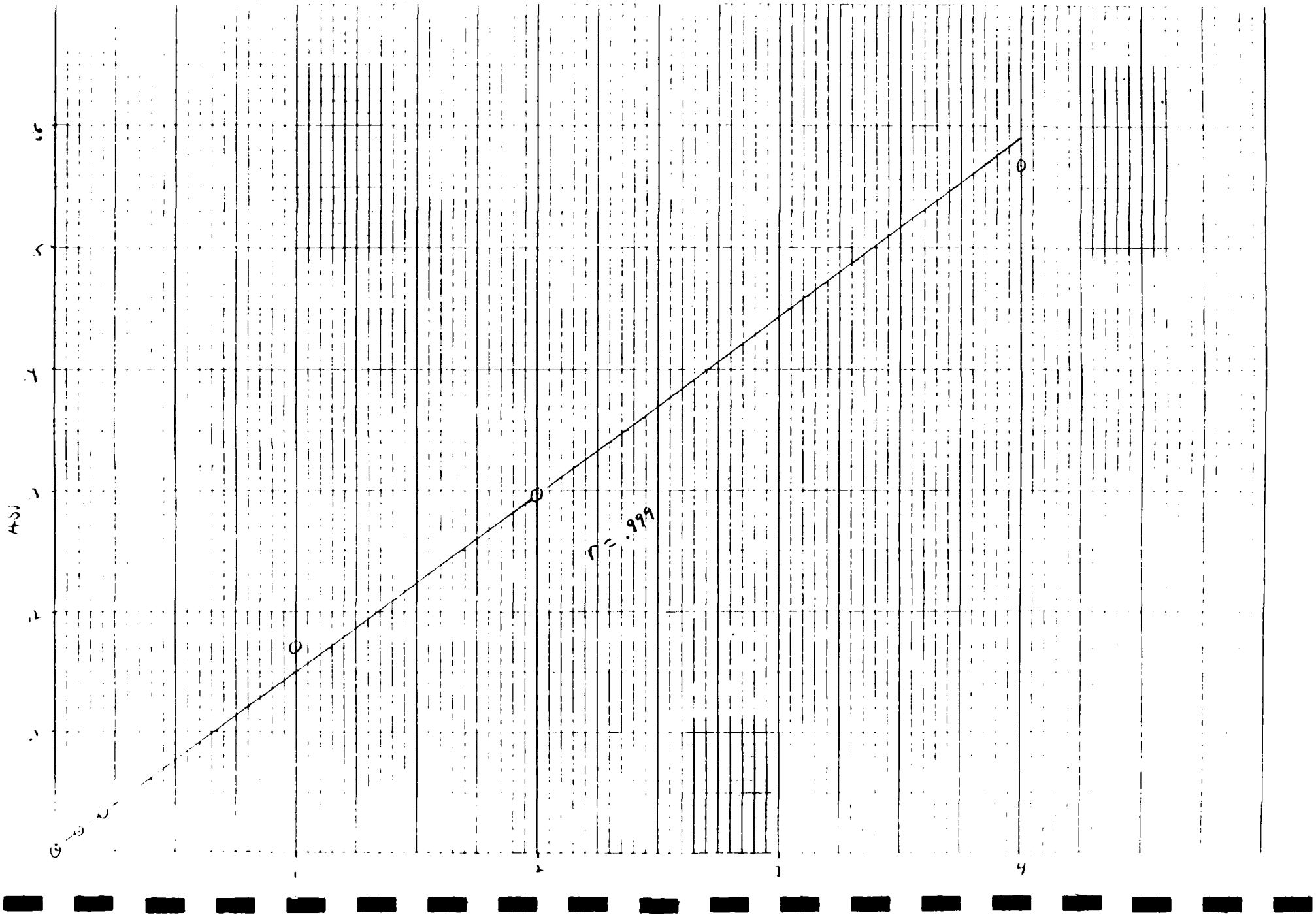
ATTACHMENT A

PCB Recoveries

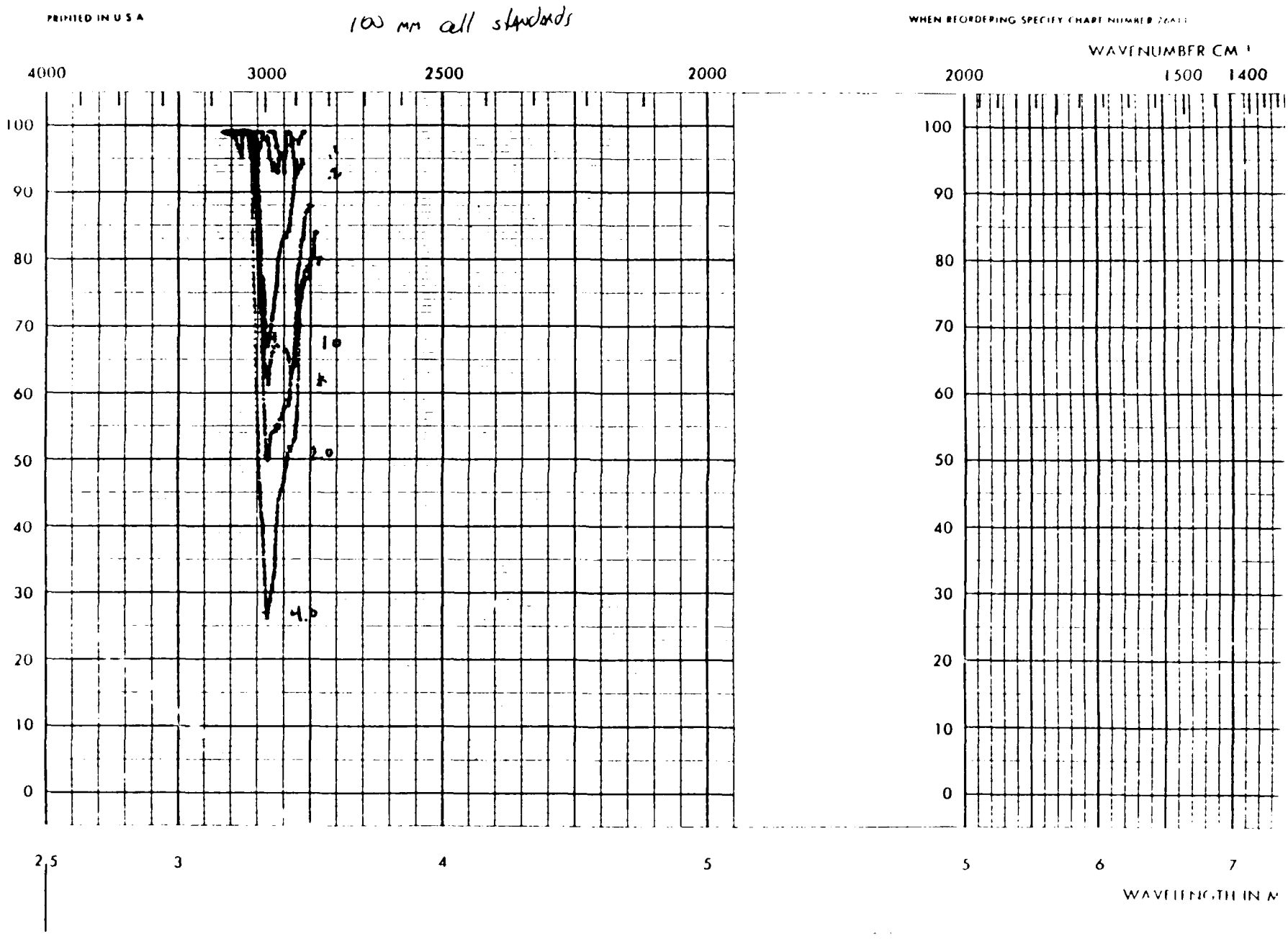
MW 024	41%	SL 13	73%
MW 025	43%	SL 14	34%
MW 027	21%	SL 14-Rep.	37%
MW 027 Rep.	26%	SL 15	32%
QA 12	79%	SL 16	65%
QA 13	81%		
QA 14	20%		
Method Blank	79%		

ATTACHMENT B

100 nm cell standard curve

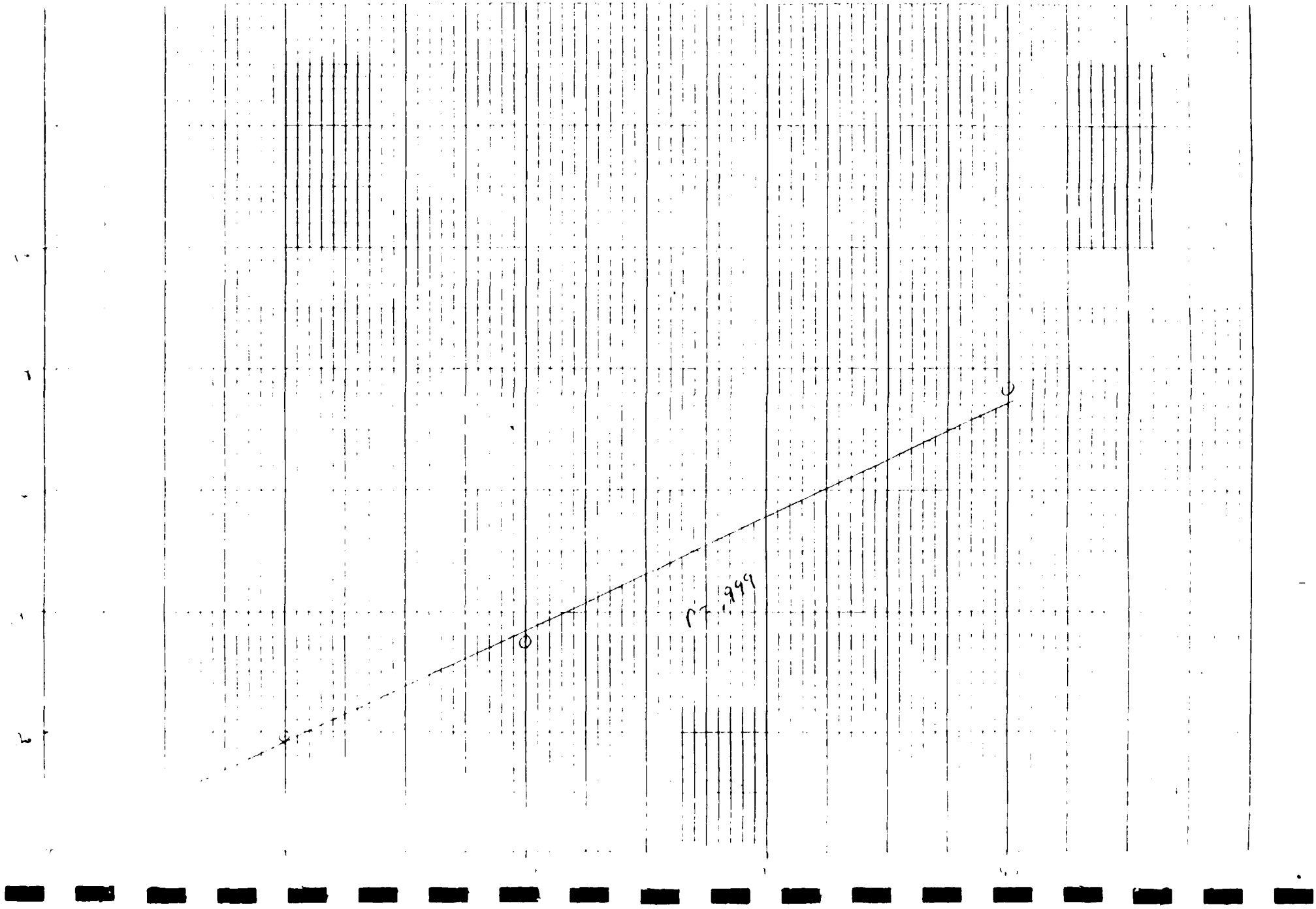


ATTACHMENT B (continued)

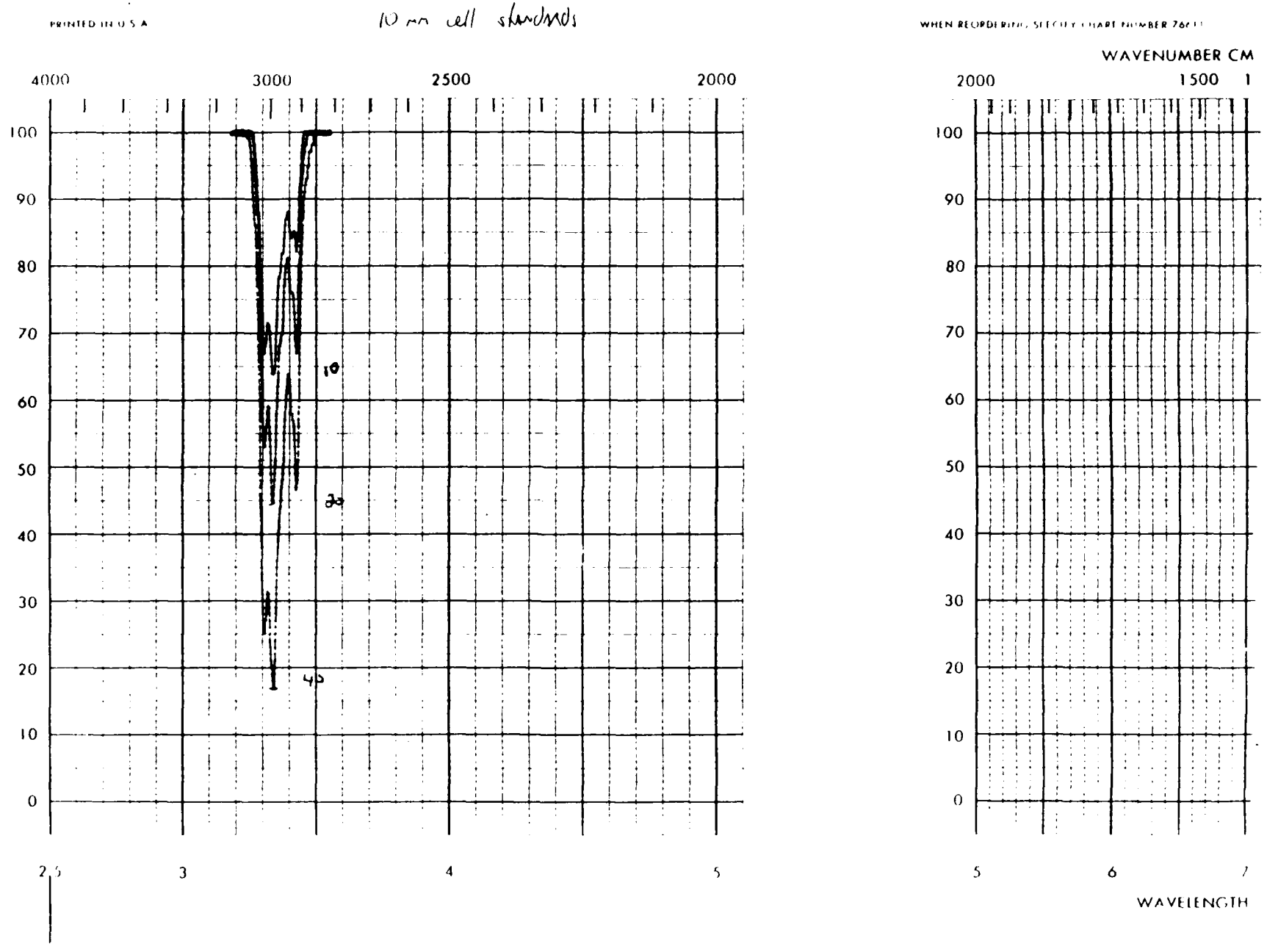


ATTACHMENT (continued)

10 mm cell standard curve



ATTACHMENT B (continued)



ENVIRONMENTAL RESEARCH GROUP, INC.

117 N. First Ann Arbor, Michigan 48104 (313) 662-3104

CLIENT: JRB Associates
PROJECT NO: A2776
SAMPLE ID: 125539

QUALITY CONTROL REPORT

DUPLICATE ANALYSIS

SAMPLE IDENTIFICATION	Aliquot 1	Aliquot 2	Relative Percentage Difference
Benzene	12.0	11.0	8.7%
Vinyl chloride	9.0	7.0	25.0%
1,2-Dichloroethane	62.0	68.0	9.2%
trans-1,2-Dichloroethene	220.0	220.0	0.0%
Tetrachloroethene	6.3	6.3	0.0%
Toluene	3.1	3.3	6.3%
Trichloroethene	18.0	18.0	0.0%

All other compounds reported as ND in the initial analysis were also ND in the duplicate analysis.

This QC Report also covers the following sample numbers: 125537-125546
125599

CLIENT: JRB Associates
PROJECT NO: A2776
SAMPLE ID: 125608

QUALITY CONTROL REPORT

DUPLICATE ANALYSIS

SAMPLE IDENTIFICATION	Aliquot 1	Aliquot 2	Relative Percentage Difference
Chloroform	20.0	20.0	0.0%
1,2-Dichloroethane	25.0	25.0	0.0%
Tetrachloroethene	0.2	0.2	0.0%
Toluene	0.76	1.6	71.2%

All other compounds reported as ND in the initial analysis were also ND in the duplicate analysis.

This QC Report also covers the following sample numbers: 125600-125610

CLIENT: JRB Associates
PROJECT NO: A2776
SAMPLE NO: 125599

QUALITY CONTROL REPORT

MATRIX SPIKE ANALYSIS

Compound Name	SAMPLE RESULT	SPIKED SAMPLE RESULT	SPIKE ADDED	PERCENTAGE RECOVERY
trans-1,2-Dichloroethene	20.0	54.2	28.0	122%
1,2-Dichloroethane	0.58	29.2	22.0	130%
1,1,1-Trichloroethane	0.0	20.2	20.0	101%
1,1-Dichloroethene	45.0	69.4	20.0	122%
Trichloroethene	170.0	200.2	21.6	140%
Benzene	0.0	20.1	20.8	97%
Toluene	0.0	19.6	21.0	93%
Ethylbenzene	0.0	21.2	22.2	95%

This QC report also covers the following sample numbers: 125537-125449 & 125599

Units of Concentration = ug/l

CLIENT: JRB Associates
PROJECT NO: A2776
SAMPLE NO: 125608

QUALITY CONTROL REPORT

MATRIX SPIKE ANALYSIS

Compound Name	SAMPLE RESULT	SPIKED SAMPLE RESULT	SPIKE ADDED	PERCENTAGE RECOVERY
trans-1,2-Dichloroethene	0.0	32.5	28.0	116%
1,2-Dichloroethane	0.0	24.0	22.0	109%
1,1,1-Trichloroethane	0.0	20.2	20.0	101%
1,1-Dichloroethene	0.0	21.3	20.0	107%
Trichloroethene	0.0	23.3	21.6	108%
Benzene	0.0	19.0	20.8	91%
Toluene	0.76	21.4	21.0	98%
Ethylbenzene	0.0	22.0	22.2	99%

This QC report also covers the following sample numbers: 125600-125610

Units of Concentration = ug/l

SAMPLE LOCATION	OIL & GREASE mg/l	CYANIDE mg/l	PHENOLS mg/l	TOX mg/l	TOC mg/l	PCB ug/l	POC mg/l
MW 010	0.44	<0.005	<0.005	0.045	8.9		3.9
MW 011	0.45	0.007		0.08	4.5		1.3
MW 012	<0.10	<0.005	<0.005	0.016	2.3		0.9
MW 013	1.30	0.008	0.011	0.093	24.0		10.
MW 021	<0.10	0.009	<0.005	0.065	2.8		1.7
MW 022	0.15	0.006	<0.005	0.10	2.4		1.0
MW 023	0.12	<0.005	<0.005	<0.010	5.4		1.7
QA1	0.11	<0.005	<0.005	75.	2.5		1.5
QA2	0.19	<0.005	<0.005	0.068	20.0		1.5
QA3	<0.10	0.007	<0.005	<0.010	2.9		1.3
QA4	0.28	<0.005	<0.005	0.064	4.7		1.4
QA5	<0.10	<0.005	<0.005	0.035	6.8		1.4
MW 005	<0.10	0.009	<0.005	0.12	23.0		0.7
MW 006	<0.10	<0.005	<0.005	0.075	2.8		0.6
MW 007	<0.10	<0.005	<0.005	0.073	6.6		0.6
MW 008	0.26	<0.005	<0.005	0.095	5.3		1.1
MW 009	<0.10	<0.005	<0.005	0.065	2.7		0.4
MW 014	<0.10			0.045	16.0		<0.1
MW 015	<0.10			0.073	3.4		0.5
MW 016	<0.10			0.045	1.6		0.3
MW 017	<0.10			0.073	2.6		0.5
QA6	<0.10	<0.005	<0.005	0.068	1.8		0.4
QA7	<0.10	<0.005	<0.005	0.075	5.3		0.5
MW P005	<0.10				5.0		1.0
MW P006	<0.10				3.3		1.5
MW P007	2.02				20.		14.
MW P008	1.42				11.		7.2

SAIC

SAMPLE LOCATION	OIL & GREASE mg/l	CYANIDE mg/l	PHENOLS mg/l	TOX mg/l	TOC mg/l	PCB ug/l	POC mg/l
MW 001	<0.10	<0.005	<0.005	0.33	3.0		1.4
MW 002	<0.10	<0.005	<0.005	0.26	3.7		0.6
MW 004	<0.10	<0.005	<0.005	0.26	2.5		0.3
MW 101	<0.10	<0.005	<0.005	0.32	3.4		0.2
MW 102	<0.10	<0.005	0.016	0.46	11.		1.6
MW 103	0.82	<0.005	6.3	7.5	74.		32.
QA8	<0.10	<0.005	<0.005	0.33	2.4		0.4
QA9	<0.10	<0.005	<0.005	0.23	1.2		<0.1
QA10	<0.10	<0.005	<0.005	0.23	1.8		0.1
MW 018	0.14			0.12	1.6		0.2
MW 019	0.11			0.13	1.3		0.6
MW 020	<0.10			0.12	8.9		1.8
MW 024	0.11	0.006	<0.005	0.10	3.0	ND	1.0
MW 025	<0.10	<0.005	<0.005	1.0	1.9	ND	1.1
MW 027	<0.10	0.006	<0.005	1.4	3.8	ND	2.3
MW P001	0.12				2.1		0.7
MW P002	0.43*				4.9		2.1
MW P003	0.24				32.		1.6
QA12	<0.10	0.006	<0.005	0.10	0.4	ND	0.1
QA13	<0.10	0.010	0.006	0.10	0.7	ND	<0.1
QA14	0.49	0.006	<0.005	8.2	4.7	ND	2.2

*approximately 10% of sample lost in analysis.

SAIC

SAMPLE LOCATION	OIL & GREASE mg/l	CYANIDE mg/l	PHENOLS mg/l	TOX mg/l	TOC mg/l	PCB ug/l	POC mg/l
SW001	92.9	0.010	34.	1.2	300.		58.
SW002	26.1	0.013	0.026	1.2	110.		16.
SW003	0.25	<0.005	<0.005	2.6	16.		11.
SW004	0.18	<0.005	<0.005	0.11	11.		0.9
SW005	0.25	<0.005	<0.005	0.06	8.9		0.5
SW006	<0.10	<0.005	<0.005	0.09	7.7		0.2
SW007	<0.10	<0.005	<0.005	0.06	5.8		0.3
SW008	0.16	<0.005	<0.005	0.09	4.5		0.2
QA11	<0.1	<0.005	<0.005	0.08	0.6		<0.1
SW009	<0.10			0.094	3.0		0.2
SW010	<0.10			0.066	2.5		0.2
SW011	<0.10				4.4		0.8
SW012	0.21				4.9		0.2
SW013	<0.10				4.1		<0.1
SW014	<0.10				5.3		<0.1
SW001B	1.25	0.013	44.				
SW002B	2.69	0.010	3.1				
SW011B	0.34						
SW012B	<0.10						
SW013B	0.21						
SW014B	<0.10						
SW016	<0.10				29.		0.2
QA18	<0.10			0.066	12.		<0.1
QA19	<0.10			0.094	18.		0.2
QA15	2.30	<0.005	<0.005	1.0	3.2		0.7
QA16	17.0	0.013	0.056	1.5	120.		11.
0052-ND-016	<0.10				13.0		0.1

SAMPLE LOCATION	OIL & GREASE mg/kg	CYANIDE mg/kg	PHENOLS mg/kg	TOX mg/kg	TOC (%)	PCB ug/kg
SD009	119			2.1	0.3%	
SD0010	114			3.1	1.8%	
SD0011	232			0.89	2.3%	
SD0012	<3.0			0.59	1.3%	
SD003	75.7	0.2	0.3	0.15	0.3%	
SD004	390	0.7	<0.1	<0.1	0.9%	
SD005	328	0.2	<0.1	0.31	0.1%	
SD006	2,770	0.8	0.1	0.20	2.2%	
SD-1	7,040	0.2	3.2	16.	3.2%	
SD-2	1,070	0.2	0.1	0.12	1.2%	
QA17	1,240	0.2	<0.1	0.18	<0.01%	
SD007	136	0.1	<0.1	0.27	<0.1%	
SD008	1,430	1.1	0.5	1.8	4.4%	
SD17	3.53				0.2%	
SD019	65.1				0.9%	
SL13	71.3	0.3	<0.1	2.9	0.3%	240-1260
SL14	629	0.4	<0.1	1.8	1.1%	ND
SL15	291	0.4	0.9	1.1	1.4%	ND
SL16	23.7	0.1	0.8	0.26	0.3%	ND
QA20	63.9			0.96	4.1%	
SD020	78.0			1.1	2.3%	
SD021	46.4			0.98	4.8%	
SD022	71.4			0.97	2.4%	
SD023	65.4			0.63	4.2%	
SD024	53.4			0.89	3.4%	
SD025	7.56			0.65	4.6%	
SD026	17.3			0.53	1.3%	
SD027	12.4			0.24	1.5%	

DR-1 EP Toxicity - samples passed

Ignitability - not flammable

Note: All soil samples reported on dry basis

SAMPLE LOCATION	Ag (ug/l)	As (ug/l)	Cd (ug/l)	Cr (ug/l)	Cu (ug/l)	Fe (ug/l)	Hg (ng/l)	Ni (ug/l)	Pb (ug/l)	Zn (ug/l)
QA-8	<0.050	<25.0	0.384	<0.200	1.88	<1.00	334.	<2.00	7.[illegible]	[illegible]
QA-9	<0.050	<25.0	<0.050	<0.200	2.43	<1.00	29.6	<2.00	[illegible]	[illegible]
QA-10	<0.050	<25.0	0.186	9.81	4.99	7.32	23.9	9.11	[illegible]	[illegible]
BP-84 0483	0.089	<25.0	0.536	89.4	42.1	72.7	109.	43.8	[illegible]	[illegible]
SW003	<0.050	<25.0	0.685	0.415	1.33	3.74	18.1	6.18	[illegible]	[illegible]
SW005	0.051	<25.0	2.47	1.92	15.2	5.26	23.6	31.6	[illegible]	[illegible]
SW006	<0.050	<25.0	1.18	0.809	5.10	1.70	26.5	[illegible]	[illegible]	[illegible]
SW007	<0.050	<25.0	1.24	0.940	4.55	1.43	8.03	4.79	[illegible]	[illegible]
SW008	0.090	<25.0	2.35	2.45	5.45	1.69	24.9	4.15	[illegible]	[illegible]
QA-11	<0.050	<25.0	0.205	0.323	1.39	<1.00	<6.25	<2.00	[illegible]	[illegible]
MW-018	<0.050	<25.0	0.578	27.2	14.4	10.8	9.75	54.8	[illegible]	[illegible]
MW-019	<0.050	<25.0	0.783	1.40	12.6	3.37	9.50	<2.00	[illegible]	[illegible]
MW-020	<0.050	<25.0	2.83	3.77	9.68	24.5	<6.25	14.0	[illegible]	[illegible]
MW-024	0.051	<25.0	1.24	89.1	55.5	28.8	98.4	43.7	[illegible]	[illegible]
MW-025	0.085	<25.0	1.31	234.	90.7	41.4	195.	99.5	[illegible]	[illegible]
MW-027	0.120	<25.0	0.510	56.3	28.1	15.2	141.	32.7	[illegible]	[illegible]
QA-12	<0.050	<25.0	0.207	<0.200	1.28	<1.00	<6.25	<2.00	[illegible]	[illegible]
QA-13	0.50	<25.0	<0.050	<0.200	1.22	<1.00	10.8	<2.00	[illegible]	[illegible]
QA-14	0.141	<25.0	0.631	53.3	31.1	17.5	100.	28.4	[illegible]	[illegible]
SW-001	1.18	<25.0	139.	2495.	99.9	2.51	26.8	55.1	[illegible]	[illegible]
SW-002	0.799	<25.0	121.	783.	44.9	1.84	<6.25	15.7	[illegible]	[illegible]
QA-15	<0.050	<25.0	<0.050	0.493	1.31	<1.00	<6.25	6.50	[illegible]	[illegible]
QA-16	0.931	<25.0	129.	775.	46.7	1.90	46.4	15.6	52.7	[illegible]
SW-011	<0.050	<25.0	0.540	2.11	1.48	3.55	9.13	<2.00	[illegible]	[illegible]
SW-012	<0.050	<25.0	0.920	1.56	3.12	3.75	<6.25	<2.00	8.68	[illegible]
SW-013	<0.050	<25.0	1.63	2.75	[illegible]	[illegible]	[illegible]	<2.00	[illegible]	[illegible]
SW-014	<0.050	<25.0	0.434	5.73	2.32	5.28	<6.25	<2.00	[illegible]	[illegible]
QA-18	<0.050	<25.0	0.555	0.476	1.14	<1.00	<6.25	<2.00	[illegible]	[illegible]
QA-19	0.056	<25.0	0.388	0.717	1.47	0.234	<6.25	<2.00	[illegible]	[illegible]
SW-9	0.393	<25.0	0.310	1.87	2.35	0.279	<6.25	<2.00	[illegible]	[illegible]
MW-010	0.050	<25.0	0.229	40.6	15.3	12.8	105.	12.0	[illegible]	[illegible]
MW-011	0.050	<25.0	0.340	17.0	12.1	4.58	10.	[illegible]	[illegible]	[illegible]
MW-012	0.050	<25.0	0.081	17.5	8.26	[illegible]	16.3	11.7	[illegible]	[illegible]
MW-013	<0.050	<25.0	0.210	27.5	24.3	28.4	171.	10.2	[illegible]	[illegible]
MW-021	<0.050	<25.0	0.458	26.9	8.39	5.95	11.6	21.1	[illegible]	[illegible]
MW-022	<0.050	<25.0	0.166	11.4	[illegible]	5.16	[illegible]	[illegible]	[illegible]	[illegible]
MW-023	0.149	<25.0	0.364	64.1	25.0	40.9	78.5	19.5	[illegible]	[illegible]
QA-1	<0.050	<25.0	<0.050	0.906	2.73	<1.00	28.1	[illegible]	[illegible]	[illegible]
QA-2	<0.050	<25.0	0.119	17.3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
QA-3	<0.050	<25.0	<0.050	0.020	1.74	32.0	<6.25	<2.00	[illegible]	[illegible]
QA-4	<0.050	<25.0	0.366	0.720	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
QA-5	<0.050	<25.0	0.119	0.570	[illegible]	[illegible]	<6.25	[illegible]	[illegible]	[illegible]
MW-005	0.063	<25.0	0.402	7.00	6.70	5.23	[illegible]	[illegible]	[illegible]	[illegible]
MW-006	<0.050	<25.0	0.228	31.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-007	<0.050	<25.0	0.365	5.34	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-008	<0.050	<25.0	0.097	1.92	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-009	[illegible]	<25.0	0.502	84.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-014	<0.050	<25.0	0.411	12.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-015	<0.050	<25.0	0.269	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-016	<0.050	<25.0	0.113	2.71	2.47	1.89	[illegible]	[illegible]	[illegible]	[illegible]
MW-017	<0.050	<25.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
QA-6	<0.050	<25.0	0.063	[illegible]	[illegible]	<1.00	[illegible]	[illegible]	[illegible]	[illegible]
QA-7	<0.050	<25.0	0.190	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-001	<0.050	<25.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-002	[illegible]	<25.0	[illegible]	119.	55.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-004	<0.050	<25.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-101	[illegible]	<25.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-102	[illegible]	<25.0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
MW-103	[illegible]	<25.0	[illegible]	455.	185.	170.	381.	275.	[illegible]	[illegible]
SW-10	<0.050	<25.0	[illegible]	[illegible]	[illegible]	[illegible]	<6.25	<2.00	[illegible]	[illegible]

TRACE METALS IN SOILS COLLECTED FROM DOVER AFB (NOV., DEC. '84)
(Values in ug/g dry weight unless otherwise noted)

SAMPLE LOCATION	Ag	As	Cd	Cr	Cu	Fe (%)	Hg (ng/g)	Ni	Pb	Zn
SD-1	0.246	4.05	15.2	378.	17.2	0.216	55.0	5.08	102.	66.6
SD-2	0.050	37.2	2.71	68.1	6.63	0.460	19.6	5.78	24.0	22.6
QA-17	0.048	42.7	3.11	76.5	7.17	0.474	13.2	4.85	27.0	25.6
SD-009	0.039	11.1	0.667	10.2	6.69	0.524	17.9	5.43	47.3	18.0
SD-010	0.129	22.6	8.98	26.7	19.8	1.03	55.5	12.9	170.	75.5
SD-011	0.063	78.0	1.56	24.3	14.0	1.85	54.1	26.1	29.3	48.1
SD-012	0.058	41.4	0.763	16.3	12.1	1.08	48.9	14.0	56.5	46.6
SD-003	0.020	6.61	0.668	9.05	0.675	0.141	1.28	0.688	5.13	44.3
SD-004	0.686	36.5	2.22	146.	1147.	4.91	71.8	748.	739.	3757.
SD-005	0.446	19.6	2.51	90.5	453.	1.86	30.2	306.	342.	1588.
SD-006	2.42	18.8	16.3	126.	74.2	0.658	143.	30.5	361.	389.
SD-007	0.427	10.3	4.12	17.3	3.03	0.032	17.7	1.45	30.4	57.1
SD-008	2.35	48.5	48.2	281.	77.3	3.02	722.	42.8	532.	888.
SL-013	0.047	32.0	1.11	15.3	9.94	0.826	35.9	13.7	44.5	57.3
SL-14	0.034	25.8	3.90	13.8	12.7	0.719	34.7	9.95	47.2	52.9
SL-15	0.081	34.7	1.71	30.4	268.	0.704	65.1	12.6	183.	221.
SL-16	0.020	45.0	0.222	14.0	10.1	0.560	19.9	9.19	21.9	38.5
QA-20	0.071	26.7	0.225	7.81	5.82	0.378	56.9	6.49	30.6	58.9
SD-020	0.070	27.4	0.163	7.56	5.24	0.400	62.2	7.37	34.2	72.5
SD-021	0.084	29.5	0.246	7.98	6.40	0.269	61.0	4.82	28.5	120.
SD-022	0.089	34.1	0.295	10.9	5.99	0.351	81.3	4.93	39.5	29.1
SD-023	0.050	26.7	0.068	8.65	5.13	0.797	77.7	5.44	28.7	19.2
SD-024	0.050	32.2	0.106	8.50	4.69	0.458	56.0	5.24	31.4	21.0
SD-25	0.040	32.3	0.094	8.62	4.22	0.598	23.2	5.92	176.	23.0
SD-26	0.031	48.5	0.060	12.4	3.89	1.01	23.7	8.60	13.3	23.3
SD-27	0.034	46.4	0.060	11.2	5.04	1.06	30.6	10.0	14.8	26.4

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CLIENT Science Applications International Corporation
476 Prospect Street
La Jolla, CA 92038
ATTN: Dana Errett

LABORATORY NO 87664

DATE Jan. 21, 1985

PO #11-850423-38

REPORT ON WATER

SAMPLE IDENTIFICATION Submitted 12/05/85 and identified as shown:

TESTS PERFORMED AND RESULTS

1)	85-4290	5-1	11/28/84
2)	85-4291	5-2	11/28/84
3)	85-4292	5-2R	11/28/84
4)	85-4293	5-3	11/28/84
5)	85-4294	5-4	11/28/84
6)	85-4295	Field Blank	11/28/84
7)	85-4296	Boiler Wash	11/28/84
8)	85-4311	5-1	11/28/84
9)	85-4312	5-2	11/28/84
10)	85-4313	5-2R	11/28/84
11)	85-4314	5-3	11/28/84
12)	85-4315	5-4	11/28/84
13)	85-4316	Field Blank	11/28/84
14)	85-4317	Boiler Wash	11/28/84
15)	85-4325	5-1	11/28/84
16)	85-4326	5-2	11/28/84
17)	85-4327	5-2R	11/28/84
18)	85-4328	5-3	11/28/84
19)	85-4329	5-4	11/28/84
20)	85-4330	Field Blank	11/28/84
21)	85-4331	Boiler Wash	11/28/84
22)	85-4376	8/1	11/28/84
23)	85-4377	8-2	11/28/84
24)	85-4378	8-3	11/28/84
25)	85-4379	8-4	11/28/84
26)	85-4380	Field Blank	11/28/84
27)	85-4381	8-1	11/28/84
28)	85-4382	8-2	11/28/84
29)	85-4383	8-3	11/28/84
30)	85-8384	8-4	11/28/84
31)	85-4385	Field Blank	11/28/84
32)	85-4396	8-1	11/28/84
33)	85-4397	8-2	11/28/84
34)	85-4398	8-3	11/28/84

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35) 85-4399 8-4 11/28/84
36) 85-4400 Field Blank 11/28/84
37) 85-4478 3-2 11/30/84
38) 85-4479 3-2R 11/30/84
39) 85-4480 3-3 11/30/84
40) 85-4481 3-4 11/30/84
41) 85-4482 3-5 11/30/84
42) 85-4483 3-6 11/30/84
43) 85-4578 3D-1 11/30/84
44) 85-4579 33-1 11/30/84
45) 85-4580 3-2 11/30/84
46) 85-4581 3-2R 11/30/84
47) 85-4582 3-3 11/30/84
48) 85-4583 3-4 11/30/84
49) 85-4584 3-5 11/30/84
50) 85-4585 3-6 11/30/84
51) 85-4484 mw-010 11/29/1300 EFT D4
52) 85-4485 mw-011 11/29/1350 EFT D4
53) 85-4486 mw-012 11/29/1600 EFT D4
54) 85-4487 mw-013 11/30/84 812-56 Dover AFB-site 4 MWB ET
55) 85-4488 mw-021 11/30/84 812-56 Dover AFB-site 5 MW-02 ET
56) 85-4489 mw-022 11/30/84 812-56 Dover AFB-Site 5 1130 MW022 ET
57) 85-4490 mw-023 11/30/84 812-56 Dover AFB-Site 5 1015 MW023 ET
58) 85-4491 QA-1 11/29/1515 EFT D-4
59) 85-4492 QA-2 11/29/ EFT D-4
60) 85-4493 QA-3 11/29/1600 EFT D-4
61) 85-4494 QA-4 Dover AFB 11/30/84 ET 812-56
62) 85-4495 QA-5 Dover AFB 11/30/84 ET 812-56
63) 85-4496 11/30/84 Boiler Wash
64) 85-4497 11/30/84 Field Blank
65) 85-4498 11/30/84 3-1
66) 85-4499 11/30/84 3D-1
67) 85-4500 11/30/84 3-2
68) 85-4501 11/30/84 3-2R
69) 85-4502 11/30/84 3-3
70) 85-4503 11/30/84 3-4
71) 85-4504 11/30/84 3-5
72) 85-4505 11/30/84 3-6
73) 85-4518 11/30/84 Boiler Wash
74) 85-4519 11/30/84 Field Blank

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75) 85-4476 11/30/84 3-1
76) 85-4477 11/30/84 3D-1
77) 85-4506 mw-010 EFT
78) 85-4507 mw-011 11/29/1350 EFT
79) 85-4508 m2-012 11/29/1600 EFT
80) 85-4509 Dover AFB-Site 4 mw-13 ET 11/30/84
81) 85-4510 Dover AFB-Site 5 mw-021 ET 812-56 11/30/84
82) 85-4511 Dover AFB-Site 5 mw-022 11/30/84
83) 85-4526 Dover AFB-Site 5 mw-023 11/30/84 1015 ET 812-56
84) 85-4527 QA-1 11/29/1515 EFT
85) 85-4528 QA-2 11/29 EFT
86) 85-4529 QA-3 11/29/1600 EFT Dover AFB
87) 85-4530 Dover AFB QA-4 11/30/84 2050 ET
88) 85-4531 Dover AFB QA-5 11/30/84 1300 ET
89) 85-4586 mw-010 11/29/1300 EFT
90) 85-4587 m2-012 11/29/1600 EFT
91) 85-4512 812-56 Dover AFB-Site 5 mw-023 11/30/84 1015
92) 85-4513 QA-1 11/29/1515 EFT
93) 85-4514 QA-2 11/29/1515 EFT
94) 85-4515 QA-3 11/29/1400 EFT D-4
95) 85-4516 82-56 Dover AFB QA-4 11/30/84 1050
96) 85-4517 812-56 Dover AFB QA-5 11/30/84 1300
97) 85-4520 mw-010 11/29/1300 EFT D-4
98) 85-4521 mw-011 11/29/1350 EFT D-4
99) 85-4522 mw-012 11/29/1600 EFT D-4
100) 85-4523 812-56 Dover AFB Site 4 mw-13 11/30/84 0900 ET
101) 85-4524 812-56 Dover AFB Site 5 mw-021 11/30/84 1230 ET
102) 85-4525 812-56 Dover AFB Site 5 mw-022 11/30/84 1130 ET
103) 85-4588 812-56 Dover AFB Site 4 mw-13 11/30/84 0900 ET
104) 85-4589 812-56 Dover AFB Site 5 mw-021 11/30/84 1230 ET
105) 85-4590 812-56 Dover AFB Site 5 mw-022 11/30/84 1130 ET
106) 85-4591 812-56 Dover AFB Site 5 mw-023 11/30/84 1015 ET
107) 85-4592 QA-1 11/29/1515 EFT D-4
108) 85-4593 QA-2 11/29 EFT D-4
109) 85-4594 QA-3 11/29/EFT D-4
110) 85-4595 812-56 Dover AFB QA-4 11/30/84 1050 ET
111) 85-4596 812-56 Dover AFB QA-5 11/30/84 1300
112) 85-4597b 11/30/84 Boiler Wash
113) 85-4598 11/30/84 Field Blank
114) 812-56 Dover AFB-D-10 mw-005 0800 12/4/84 ET 85-4607

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115) 812-56 Dover AFB-D-10 mw-006 1300 12/4/84 ET 85-4607
116) 812-56 Dover AFB-D-10 mw-007 1315 12/4/84 ET 85-4607
117) 812-56 Dover AFB-D-10 mw-008 1900 12/4/84 ET 85-4610
118) 812-56 Dover AFB-D-10 mw-009 1025 12/4/84 ET 85-4611
119) 812-56 Dover AFB-D-10 mw-014 0845 12/4/84 ET 85-4612
120) 812-56 Dover AFB-D-10 mw-015 0930 12/4/84 ET 85-4613
121) 812-56 Dover AFB-D-10 mw-016 0915 12/4/84 ET 85-4614
122) 812-56 Dover AFB-D-10 mw-017 12/4/84 ET 85-4615
123) 812-56 QA-6 1408 12/4/84 ET 85-4616
124) 812-56 QA-7 1400 12/4/84 ET 85-4617
125) 812-56 Dover-D-10 mw-005 0800 12/4/84 ET 85-4618
126) 812-56 Dover-D-10 mw-006 12/4/84 ET 85-4619
127) 812-56 Dover-D-10 mw-007 1315 12/4/84 ET 85-4620
128) 812-56 Dover-D-10 mw-008 1400 12/4/84 ET 85-4621
129) 812-56 Dover-D-10 mw-009 1025 12/4/84 ET 85-4622
130) 812-56 Dover-D-10 mw-014 0845 12/4/84 ET 85-4623
131) 812-56 Dover-D-10 mw-015 0930 12/4/84 ET 85-4624
132) 812-56 Dover-D-10 mw-016 0915 12/4/84 ET 85-4625
133) 812-56 Dover-D-10 mw-017 12/4/84 ET 85-4626
134) 812-56 QA-6 1400 12/4/84 ET 85-4627
135) 812-56 QA-7 1400 12/4/84 ET 85-4628
136) 812-56 Dover-D-10 mw-005 0800 12/4/84 ET 85-4640
137) 812-56 Dover-D-10 mw-006 1300 12/4/84 ET 85-4641
138) 812-56 Dover-D-10 mw-007 1315 12/4/84 ET 85-4642
139) 812-56 Dover-D-10 mw-008 1400 12/4/84 ET 85-4643
140) 812-56 Dover-D-10 mw-009 1025 12/4/84 ET 85-4644
141) 812-56 QA-6 1400 12/4/84 ET 86-4645
142) 812-56 QA-7 1400 12/4/84 ET 85-4646
143) 812-56 Dover AFB-D-10 mw-005 0800 12/4/84 ET 85-4647
144) 812-56 Dover AFB-D-10 mw-006 1300 12/4/84 ET 85-4648
145) 812-56 Dover-D-10 mw-007 12/4/84 1315 ET 85-4649
146) 812-56 Dover-D-10 mw-008 12/4/84 1400 ET 85-4650
147) 812-56 Dover-D-10 mw-009 12/4/84/1025 ET 85-4651
148) 812-56 QA-6 12/4/84 1400 ET 85-4652
149) 812-56 QA-7 12/4/84 1400 ET 85-4653

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Sample #	Total Organic Carbon	Purgeable Organic Carbon	Sample #	Total Organic Carbon	Purgeable Organic Carbon
1	84.	5.2	56	2.4	1.0
2	86.	5.4	57	5.4	1.7
3	10.	6.6	58	2.5	1.5
4	92.	8.1	59	20.	1.5
5	88.	4.7	60	2.9	1.3
6	1.1	0.4	61	4.7	1.4
7	1.4	0.6	62	6.8	1.4
22	95.	23.	63	8.3	1.3
23	33.	7.4	64	2.1	1.4
24	120.	26.	75	7.6	1.1
25	130.	24.	76	3.8	1.4
26	1.4	0.8	114	23.	0.7
37	51.	7.4	115	2.8	0.6
38	20.	7.0	116	6.6	0.6
39	80.	12.	117	5.3	1.1
40	8.3	4.4	118	2.7	0.4
41	10.	6.1	119	16.	L/0.1
42	14.	9.9	120	3.4	0.5
51	8.9	3.9	121	1.6	0.3
52	4.5	1.3	122	2.6	0.5
53	2.3	0.9	123	1.8	0.4
54	24.	10.	124	5.3	0.5
55	2.8	1.7			

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Sample #	Cyanide, parts per million (mg/L)
83	L/0.005
84	L/0.005
85	L/0.005
86	0.007
87	L/0.005
88	L/0.005
97	L/0.005
98	0.007
99	L/0.005
100	0.008
101	0.009
102	0.006
143	0.009
144	L/0.005
145	L/0.005
146	L/0.005
147	L/0.005
148	L/0.005
149	L/0.005

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Sample #	parts per million (mg/L) Phenols	Sample #	parts per million (mg/L) Phenols
8	L/0.005	89	L/0.005
9	L/0.005	90	L/0.005
10	L/0.005	103	0.011
11	L/0.005	104	L/0.005
12	L/0.005	105	L/0.005
13	L/0.005	106	L/0.005
14	L/0.005	107	L/0.005
32	L/0.005	108	L/0.005
33	L/0.005	109	L/0.005
34	L/0.005	110	L/0.005
35	L/0.005	111	L/0.005
36	L/0.005	112	L/0.005
43	L/0.005	113	L/0.005
44	0.013	136	L/0.005
45	0.006	137	L/0.005
46	L/0.005	138	L/0.005
47	L/0.005	139	L/0.005
48	0.005	140	L/0.005
49	L/0.005	141	L/0.005
50	L/0.005	142	L/0.005

Sample #	parts per million (mg/L) Total Organic Halogens	Sample #	parts per million (mg/L) Total Organic Halogens
15	0.064	30	0.30
16	0.096	31	0.16
17	0.13	65	0.14
18	0.12	66	0.16
19	0.15	67	0.045
20	0.12	68	0.13
21	0.13	69	0.20
27	0.17	70	0.20
28	0.020	71	0.09
29	0.20	72	0.09

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Sample #	parts per million (mg/L) Total Organic Halogens	Sample #	parts per million (mg/L) Total Organic Halogens
73	0.08	96	0.035
74	0.11	125	0.12
77	0.045	126	0.075
78	0.08	127	0.073
79	0.016	128	0.095
80	0.093	129	0.065
81	0.065	130	0.045
82	0.10	131	0.073
91	L/0.010	132	0.045
92	75.	133	0.073
93	0.068	134	0.068
94	L/0.010	135	0.075
95	0.064		

Key

L/ indicates "less than"

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J.M. Owens

JMO:veg

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LABORATORY NO 87664

APPENDIX A

Replicate Quality Control Report

Sample	Analyte	Replicate 1	Replicate 2	% Relative Error
83	Cyanide	L/0.005	L/0.005	0.
101	Cyanide	0.006	0.009	(0.003)
44	Phenol	0.063	0.065	3.
108	Phenol	0.050	0.049	2.
142	Phenol	0.052	0.053	2.
2	TOC	86.	85.	1.
22	TOC	95.	92.	3.
54	TOC	24.	23.	4.
59	TOC	20.	20.	0.
62	TOC	6.2	6.8	9.
96	TOX	0.025	0.025	0.
135	TOX	0.075	0.073	(0.003)

parentheses () indicate absolute, rather than relative, error.

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Sample	Analyte	Sample Found	Spike Level	Samp & Spike Found	% Recovery
84	Cyanide	L/0.005	0.050	0.056	108.
44	Phenol	0.013	0.050	0.063	100.
108	Phenol	L/0.005	0.050	0.050	100.
142	Phenol	L/0.005	0.050	0.052	104.
23	TOC	33.	10.	42.	90.
119	TOC	16.	10.	26.	100.
16	TOX	0.024	0.050	0.037	26.
31	TOX	0.032	0.050	0.044	24.
74	TOX	0.021	0.050	0.035	28.

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CLIENT Science Applications International Corporation
476 Prospect Street
La Jolla, CA 92038
ATTN: Dana Errett

LABORATORY NO 37750

DATE Feb. 6, 1985

PO #11-S60423-38

REPORT ON WATER & SOIL

SAMPLE IDENTIFICATION Submitted 12/11/84 and identified as shown:

TESTS PERFORMED AND RESULTS

1)	85-4679	9-3	12/3/84
2)	85-4680	9-4	12/3/84
3)	85-4704	9-1	12/3/84
4)	85-4705	10-1	12/3/84
5)	85-4706	10-2	12/3/84
6)	85-4707	10-3	12/3/84
7)	85-4708	10-3R	12/3/84
8)	85-4709	Boiler Wash	12/3/84
9)	85-4710	Field Blank	12/3/84
10)	85-4711	9-1	12/3/84
11)	85-4712	9-2	12/3/84
12)	85-4713	9-3	12/3/84
13)	85-4714	9-4	12/3/84
14)	85-4715	10-1	12/3/84
15)	85-4665	9-1	12/3/84
16)	85-4666	9-2	12/3/84
17)	85-4667	9-3	12/3/84
18)	85-4668	9-4	12/3/84
19)	85-4669	10-1	12/3/84
20)	85-4670	10-2	12/3/84
21)	85-4671	10-3	12/3/84
22)	85-4672	10-3R	12/3/84
23)	85-4673	Boiler Wash	12/3/84
24)	85-4674	Field Blank	12/3/84
25)	85-4756	10-2	12/3/84
26)	85-4717	10-3	12/3/84
27)	85-4718	10-3R	12/3/84
28)	85-4719	Boiler Wash	12/3/84
29)	85-4720	Field Blank	12/3/84
30)	85-4767	812-56 Dover xyz	12/6/84 0905 mwD005 ET
31)	85-4768	812-56 Dover xyz	12/6/84 0900 mwD006 ET
32)	85-4769	812-56 Dover xyz	12/6/84 0930 mwD007 ET
33)	85-4770	812-56 Dover xyz	12/6/84 0950 mwD008
34)	85-4771	812-56 Dover t-1	12/6/84 1015 mw001

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35) 85-4772 812-56 t-1 12/6/84 1106 mw--2
36) 85-4773 812-56 t-1 12/6/84 1145 004
37) 85-4774 812-56 t-1 12/6/84 1406 101
38) 85-4775 812-56 t-1 12/6/84 14345 102
39) 85-4776 812-56 t-1 12/6/84 1530 103
40) 85-4777 812-56 Dover QA-8 12/6/84 0831
41) 85-4778 812-56 QA-9 12/6/84 0830
42) 85-4779 812-56 QA-10 12/6/84 1145
43) 85-4780 812-56 Dover-T-1 12/6/84 1015 mw001
44) 85-4781 812-56 Dover-t-1 12/6/84 1100 002
45) 85-4782 812-56 Dover-T-1 12/6/84 1145 004
46) 85-4783 812-56 Dover-T-1 12/6/84 1400 101
47) 85-4784 812-56 Dover-T-1 12/6/84 1445 102
48) 85-4785 812-56 Dover-T-1 12/6/84 1530 103
49) 85-4786 812-56 Dover-QA-8 12/6/84 0830
50) 85-4787 812-56 QA-9 12/6/84 0830
51) 85-4788 812-56 QA-10 12/6/84 1145
52) 35-4789 812-56 Dover-T-1 12/6/84 MW001
53) 85-4790 812-56 Dover-T-1 12/6/84 1100 002
54) 85-4791 812-56 Dover-T-1 12/6/84 1145 004
55) 85-4792 812-56 Dover-T-1 12/6/84 1400 101
56) 85-4793 812-56 Dover-T-1 12/6/84 1445 102
57) 85-4794 812-56 Dover-T-1 12/6/84 1530 103
58) 85-4795 812-56 Dover QA-8 12/6/84 0830
59) 35-4796 812-56 QA-0 12/6/84 1890
60) 35-4797 812-56 QA-10 12/6/84 1145
61) 85-4820 812-56 Dover T-1 12/6/84 1015 MW001
62) 85-4821 812-56 Dover T-1 12/6/84 1145 002
63) 85-4822 812-56 Dover-T-1 12/6 1145 mw004
64) 85-4823 812-56 Dover-T-1 12/6 1400 101
65) 85-4824 812-56 Dover-T-1 12/6 1445 102
66) 85-4025 812-56 Dover-T-1 12/6 1530 103
67) 35-4826 812-56 Dover-T-1 12/6 0830 QA-8
68) 85-4827 812-56 Dover-T-1 12/6 0830 QA-9
69) 85-4828 812-56 Dover-T-1 12/6 1145 QA-10
70) 35-4857 12/5/84 Field Blank
71) 35-4858 12/5/84 35w-1
72) 85-4859 12/5/84 35w-3
73) 85-4860 12/5/84 8sw-1
74) 85-4861 12/5/84 8sw-1R

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75) 85-4862 12/5/84 8sw-2
76) 85-4864 12/5/84 12/sw-1
77) 85-4865 12/5/84 12sw-2
78) 85-4866 12/6/84 8sd-1
79) 85-4867 12/6/84 8sd-2
80) 85-4868 12/6/84 9sd-1
81) 85-4869 12/6/84 9sd-2
82) 85-4870 12/6/84 10sd-1
83) 85-4871 12/8/84 10sd-2
84) 85-4872 12/5 Field Blank
85) 85-4873 12/5 3sw-1
86) 85-4874 12/5 8sw-3
87) 85-4875 12/5 8sw-1
88) 85-4876 12/5 8sw-1R
89) 85-4877 12/5 8sw-2
90) 85-4879 12/5 10sw-1
91) 85-4880 12/5 12sw-1
92) 85-4881 12/5 12sw-2
93) 85-4882 12/5 Field Blank
94) 85-4883 10/6/84 Field Blank
95) 85-4884 10/5/84 3sw-1
96) 85-4885 10/5/84 8sw-1R
97) 85-4886 10/5/84 8sw-2
98) 85-4887 10/5/84 9sw-1
99) 85-4675 12/3/84 7-1
100) 85-4676 12/3/84 7-2
101) 85-4677 12/3/84 7-3
102) 85-4678 12/3/84 9-2
103) 85-4839 Dover 005c-p6-102 12/6/84 1445 gp-84-0483
104) 85-5012 hafb qa/qc 12/7/84 1100 Boiler Wash Vickers
105) 85-5012 hafb qa/qc 12/7/84 Field Blank
106) 85-5013 hafb sp-7 12/7/84 0848 I-7
107) 85-5014 hafb 12/7/84 0905 I-3
108) 85-5015 hafb 12/7/84 0928 I-9
109) 85-5016 hafb rpta3 12/7/84 1030 I-10
110) 85-5017 hafb fpta3 12/7/84 1100 I-11
111) 85-5018 hafb qa-qc 12/7/84 1100 I-11 Rep fpta3
112) 85-5019 hafb fpta3 12/7/84 1140 I-12
113) 85-5020 hafb qa/qc 12/7/84 1100 Boiler Wash
114) 85-5021 hafb qa/qc 12/7/84 1100 Field Blank

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115) 85-5022 hafb sp-7 12/7/84 0845 I-7
116) 85-5023 hafb sp-7 12/7/84 906 I-8
117) 85-5024 hafb sp-7 12/7/84 0928 I-9
118) 85-5025 hafb fpta3 12/7/84 1030 I-10
119) 85-5026 hafb fpta3 12/7/84 1100 I-11
120) 85-5027 hafb qa/qc 12/7/84 1100 I-11 fpta3 Rep.
121) 85-4985 3-sw-2 5/Dec/84
122) 85-4986 3-sw-3 5/Dec/84
123) 85-5987 3-sw-1 5/Dec/84
124) 85-4988 9-sw-2 12/6/84
125) 85-4989 10-sw-1 12/5/84
126) 85-4990 10-sw-2 12/5/84
127) 85-4996 Field Blank 12/6/84
128) 85-5001 Field Blank 12/6/84
129) 85-4997 3-sw-2 12/5/84
130) 85-4998 9-sw-1 12/6/84
131) 85-4999 9-sw-2
132) 85-5002 B-sw-2 12/5/84
133) 85-5003 9-sw-2 12/6/84
134) 85-5004 10-sw-2 12/5/84
135) 85-4916 Field Blank Sediment
136) 85-4917 sd-1 12/6/84
137) 85-4918 3sd-2 12/6/84
138) 85-4919 3sd-3 12/6/84
139) 85-4920 12sd-1 12/6/84
140) 85-4921 12sd-2 12/6/84
141) 85-4866 8sd-1 12/6/84
142) 85-5028 hafb fpta-3 11/7/84 1140 I-12
143) 85-4964 sw003 12/7/84 1040 North Ditch Dover
144) 85-4965 sw004 12/7/84 1015 North Ditch Dover
145) 85-4966 sw005 12/7/84 1000 North Ditch Dover
146) 85-4967 sw006 12/7/84 0930 North Ditch Dover
147) 85-4968 sw007 12/7/84 0900 North Ditch Dover
148) 85-4969 sw008 12/7/84 0830 North Ditch Dover
149) 85-4970 qa-11 12/7/84 0830
150) 85-4971 sw003 12/7/84 1040 North Ditch Dover
151) 85-4972 sw004 12/7/84 1015 North Ditch Dover
152) 85-4973 sw005 12/7/84 1000 North Ditch Dover
153) 85-4974 sw006 12/7/84 0930 North Ditch Dover
154) 85-4975 sw007 12/7/84 0900 North Ditch Dover

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155) 85-4976 sw008 12/7/84 0820 North Ditch Dover
156) 85-4977 qa-11 12/7/84 0550 North Ditch Dover
157) 85-4935 sw003 12/7/84 1040 North Ditch Dover
158) 85-4938 sw004 12/7/84 1015 North Ditch Dover
159) 85-4939 sw005 12/7/84 1000 North Ditch Dover
160) 85-4940 sw006 12/7/84 0930 North Ditch Dover
161) 85-4941 sw007 12/7/84 0906 North Ditch Dover
162) 85-4942 sw008 12/7/84 0820 North Ditch Dover
163) 85-4943 qa-11 12/7/84 0830 North Ditch Dover
164) 85-4951 sw003 12/7 1040 North Ditch Dover AFB
165) 85-4952 sw004 12/7 1015 North Ditch Dover AFB
166) 85-4953 sw005 12/7 1000 North Ditch Dover AFB
167) 85-4954 sw006 12/7 0930 North Ditch Dover AFB
168) 85-4955 sw007 12/7 0900 North Ditch Dover AFB
169) 85-4956 sw008 12/7 0830 North Ditch Dover AFB
170) 85-4957 qa-11 12/7 0830 North Ditch Dover AFB
171) 85-5065 hafb qa/qc 12/10/84 0835 Boiler Wasn Vichers
172) 85-5066 hafb qa/qc 12/10/84 0835 Blank Vickers
173) 85-5067 hafb sp-1 12/10/84 0800 I-1 Vickers
174) 85-5068 hafb qa/qc 12/10/84 0820 replicate sp-1, I-2
175) 85-5069 hafb sp-1 12/10/84 0820 I-2
176) 85-5070 hafb sp-1 12/10/84 0850 I-3
177) 85-4922/ 2 of 2 hafb 12/sd-1 12/6/84
178) 85-4923 hafb 12 sd-2 12/6/84
179) 85-4924 hafb 9sd-1 12/6/84
180) 85-4925 hafb 9sd-2 12/6/84
181) 85-4926 hafb 10sd-1 12/6/84
182) 85-4927 hafb 10sd-2 12/6/84
183) 85-4928 hafb 3sd-1 12/6/84
184) 85-4929 hafb 3sd-2 12/6/84
185) 85-4930 hafb 3sd-3 12/6/84
186) 85-4931 hafb 8sd-1 12/6/84
187) 85-4932 hafb 8sd-2 12/6/84
188) 85-4933 hafb Field Blank Sediments 12/6/84

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Note: Water samples were reported in parts per million (mg/L), and soil samples were reported in parts per million (mg/kg), on a dry basis.

Sample #	Total Organic Carbon	Purgeable Organic Carbon	Sample #	Total Organic Carbon	Purgeable Organic Carbon
1	7.4	1.8	99	37.	6.5
2	46.	5.3	100	9.4	5.3
3	47.	6.9	101	21.	8.9
4	16.	6.3	102	5.3	3.3
5	22.	13.	113	1.1	L/0.1
6	77.	3.9	114	1.6	0.2
7	70.	3.5	115	93.	28.
8	1.2	0.2	116	170.	32.
9	5.8	0.2	117	62.	13.
30	5.0	1.0	118	98.	46.
31	3.3	1.5	119	64.	25.
32	20.	14.	120	58.	19.
33	11.	7.2	127	1.0	L/0.1
34	3.0	1.4	129	8.2	1.9
35	3.7	0.6	130	6.3	2.4
36	2.5	0.3	131	7.3	2.0
37	3.4	0.2	142	90.	27.
38	11.	1.6	150	16.	11.
39	74.	32.	151	11.	0.9
40	2.4	0.4	152	3.9	0.5
41	1.2	L/0.1	153	7.7	0.2
42	1.8	0.1	154	5.8	0.3
70	0.8	0.2	155	4.5	0.2
71	8.9	1.1	156	0.6	L/0.1
72	25.	0.9	188*	0.4	L/0.1
73	6.2	0.3			
74	3.0	0.3			
75	23.	1.2			
76	2.4	0.7			
77	3.0	0.7			

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Sample #	Cyanide, parts per million
52	L/0.005
53	L/0.005
54	L/0.005
55	L/0.005
56	L/0.005
57	L/0.005
58	L/0.005
59	L/0.005
60	L/0.005
103	L/0.005
164	L/0.005
165	L/0.005
166	L/0.005
167	L/0.005
168	L/0.005
169	L/0.005
170	L/0.005
171	L/0.005
172	L/0.005
173	L/0.005
174	L/0.005
175	L/0.005
176	L/0.005

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	parts per million		parts per million	%
Sample #	Phenols	Sample #	Phenols	Total Solids
15	L/0.005	98	L/0.005	---
16	L/0.005	121**	L/0.005	---
17	L/0.005	122	L/0.005	---
18	L/0.005	123**	0.008	---
19	L/0.005	124	L/0.005	---
20	L/0.005	125	L/0.005	---
21	L/0.005	126	L/0.005	---
22	L/0.005	157	L/0.005	---
23	0.006	158	L/0.005	---
24	L/0.005	159	L/0.005	---
61	L/0.005	160	L/0.005	---
62	L/0.005	161	L/0.005	---
63	L/0.005	162	L/0.005	---
64	L/0.005	163	L/0.005	---
65	0.016	179	0.2	28.1
66	6.3	180	1.0	28.4
67	L/0.005	181	L/0.005	71.3
68	L/0.005	182	L/0.005	70.5
69	L/0.005	183	0.4	50.5
93**	0.007	184	0.6	53.6
94**	0.007	185	L/0.005	73.6
95	L/0.005	186	0.4	72.5
96**	0.010	187	L/0.2	26.1
97**	0.015	188**	0.010	---

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Sample #	parts per million Total Organic Halogens	Total Solids	Sample #	parts per million Total Organic Halogens	Total Solids
10	0.23	---	90	0.33	---
11	0.24	---	91	0.45	---
12	0.23	---	92	0.38	---
13	0.20	---	104	0.01	---
14	0.19	---	105	0.01	---
25	1.4	---	106	0.01	---
26	0.20	---	107	0.02	---
27	0.55	---	108	0.03	---
28	0.49	---	109	L/0.010	---
29	0.20	---	110	0.02	---
43	0.33	---	111	0.02	---
44	0.26	---	112	0.02	---
45	0.26	---	128	0.05	---
46	0.32	---	132	0.11	---
47	0.46	---	133	0.05	---
48	7.5	---	134	0.07	---
49	0.33	---	135	0.37	---
50	0.23	---	136	2.4	63.0
51	0.23	---	137	4.1	73.1
78	1.6	81.9	138	2.5	74.2
79	1.8	71.6	139	2.4	62.8
80	2.3	69.8	140	2.4	76.2
81	5.1	31.2	141	0.21	---
82	2.1	75.0	143	2.6	77.8
83	2.2	83.6	144	0.11	---
84	0.25	---	145	0.06	---
85	0.16	---	146	0.09	---
86	0.35	---	147	0.06	---
87	0.30	---	148	0.09	---
88	0.28	---	149	0.08	---
89	0.14	---			

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Key

L/ indicates "less than".
* sample was received unpreserved and with headspace.
** samples for phenols were received unpreserved.

Respectfully submitted,

Laucks Testing Laboratories, Inc.

Mike Nelson

MN:veg

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LABORATORY NO 87750

APPENDIX A

Replicate Quality Control Report

Sample	Analyte	Replicate 1	Replicate 2	% Relative Error	Control Limits
52	Cyanide	L/0.005	L/0.005	0.	0-10
60		L/0.005	L/0.005	0.	0-10
164		0.053	0.055	4.	0-10
176		0.056	0.055	2.	0-10
65	Phenol	0.053	0.066	6.	0-10
126		0.051	0.051	0.	0-10
163		0.050	0.050	0.	0-10
179		2.6	1.6	48.	0-10
1	TOC	7.2	7.4	3.	0-9
34		3.0	2.9	3.	0-9
10	TOX	0.224	0.228	2.	*
43		0.33	0.37	11.	*
85		0.16	0.19	17.	*
104		0.014	0.014	0.	*
132		0.115	0.105	9.	*
80		0.160	0.150	6.	*
73	TOC	6.2	5.8	7.	0-9
114		1.6	1.5	6.	0-9
119		64.	64.	0.	0-9
142		90.	89.	1.	0-9

* No limits established

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APPENDIX B

Spike Quality Control Report

Sample	Analyte	Sample Found	Spike Level	Samp & Spike Found	% Recovery	Control Limits
53	Cyanide	L/0.005	0.050	0.053	106.	*
164		L/0.005	0.050	0.053	106.	*
176		L/0.005	0.050	0.055	110.	*
65	Phenol	0.016	0.050	0.066	100.	*
126		L/0.005	0.050	0.051	102.	*
163		L/0.005	0.050	0.050	100.	*
179		0.2	1.8	1.6	78.	*
1	TOC	7.4	10.	18.	106.	83-120
11	TOX	0.048	0.050	0.048	0.	*
44		0.026	0.050	0.048	44.	*
86		0.035	0.050	0.052	34.	*
105		0.004	0.050	0.040	73.	*
133		0.01	0.050	0.016	14.	*
128		0.01	0.050	0.045	62.	*
79		0.026	0.050	0.064	76	*
73	TOC	6.2	10.	17.	108.	83-120
130		6.3	10.	17.	107.	83-120

* No limits established

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CLIENT Science Applications International Corporation
476 Prospect Street
La Jolla, CA 92038
ATTN: Dana Errett

LABORATORY NO. 87860-a

DATE Feb. 12, 1985

PO #11-850423-38

REPORT ON WATER & SOIL

SAMPLE IDENTIFICATION

Submitted 12/19/84 and identified as shown:

TESTS PERFORMED AND RESULTS

1) 85-5342 Dover AFB SW001B 12/14/84 1100
2) 85-5343 Dover AFB 002B 12/14/84 1100
3) 85-5344 Dover AFB 001B 12/14/84 1100
4) 85-5345 Dover AFB 002B 12/14/84 1100
5) 85-5346 Dover AFB SL-13 12/13/84 0900 ET
6) 85-5347 Dover AFB SL-14 12/13/84 0900 ET
7) 85-5348 Dover AFB SL-15 12/13/84 0900 ET
8) 85-5349 Dover AFB SL-16 12/13/84 0900 ET
9) 85-5350 Dover AFB QA-20 12/14/84 0900 ET
10) 85-5351 Dover AFB SD-020 12/14/84 0900 ET
11) 85-5352 Dover AFB SD-021 12/14/84 0900 ET
12) 85-5353 Dover AFB SD-022 12/14/84 0900 ET
13) 85-5354 Dover AFB SD-023 12/14/84 0900 ET
14) 85-5355 Dover AFB SD-024 12/14/84 0900 ET
15) 85-5356 Dover AFB SD-025 12/14/84 0900 ET
16) 85-5357 Dover AFB SD-026 12/14/84 0900 ET
17) 85-5358 Dover AFB SD-027 12/14/84 0900 ET
18) 85-5359 Dover AFB SW-009 12/14/84 ET
19) 85-5360 Dover AFB SW-010 12/14/84 ET
20) 85-5361 Dover AFB SW-016 12/14/84 ET
21) 85-5362 Dover AFB QA-18 12/14/84 ET
22) 85-5363 Dover AFB QA-19 12/14/84 ET
23) 85-5364 Dover AFB SW-009 12/14/84 ET
24) 85-5365 Dover AFB SW-010 12/14/84 ET
25) 85-5366 Dover AFB QA-18 12/14/84 ET
26) 85-5367 Dover AFB QA-19 12/14/84 ET
27) 85-5368 Dover AFB 0052-NA-016 6N-84-0538 12/14/84 ET
28) 85-5185 Dover AFB SW-001 12/12/84 ET
29) 85-5186 Dover AFB SW-002 12/12/84 ET
30) 85-5187 Dover AFB QA-15 12/12/84 ET 0930
31) 85-5188 Dover AFB QA-16 12/12/84 0930 ET
32) 85-5189 Dover AFB SW-001 12/12/84 0930 ET
33) 85-5190 Dover AFB SW-002 12/12/84 ET
34) 85-5191 Dover AFB QA15 12/12/84 0930 ET

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35) 85-5192 Dover AFB Qa-16 12/12/84 0930 ET
36) 85-5197 Dover AFB SW-001 12/12/84 0930 ET
37) 85-5198 Dover AFB SW-002 12/12/84 ET
38) 85-5199 Dover AFB QA-15 12/12/84 0930 ET
39) 85-5200 Dover AFB QA-16 12/12/84 0930 ET
40) 85-5201 Dover AFB SW-001 12/12/84 0930 ET
41) 85-5202 Dover AFB SW-002 12/12/84 ET
42) 85-5703 Dover AFB QA-15 12/12/84 0930 ET
43) 85-5204 Dover AFB QA-16 12/12/84 0930 ET
44) 85-5205 Dover AFB SD-1 12/12/84 ET
45) 85-5206 Dover AFB SD-2 12/12/84 0930 ET
46) 85-5207 Dover AFB QA-17 12/12/84 1000 ET
47) 85-5089 Dover AFB MW-024 12/11/84 1030 ET
48) 85-5090 Dover AFB MW-025 12/11/84 1100 ET
49) 85-5091 Dover AFB MW-027 12/11/84 1430 ET
50) 85-5092 Dover AFB QA-12 12/11/84 ET
51) 85-5093 Dover AFB QA-13 12/11/84 ET
52) 85-5094 Dover AFB QA-14 12/11/84 1430 ET
53) 85-5107 Dover AFB MW-018 12/11/84 0900 ET
54) 85-5108 Dover AFB MW-019 12/11/84 0930 ET
55) 85-5109 Dover AFB MW-020 12/11/84 1000 ET
56) 85-5110 Dover AFB MW-024 12/11/84 1030 ET
57) 85-5111 Dover AFB MW-025 12/11/84 1100 ET
58) 85-5112 Dover AFB MW-027 12/11/84 1430 ET
59) 85-5113 Dover AFB QA-12 12/11/84 ET
60) 85-5114 Dover AFB QA-13 12/11/84 ET
61) 85-5115 Dover AFB QA-14 12/11/84 1430 ET
62) 85-5122 Dover AFB MW-015 12/11/84 0900 ET
63) 85-5123 Dover AFB MW-019 12/11/84 0930 ET
64) 85-5124 Dover AFB MW-020 12/11/84 1000 ET
65) 85-5125 Dover AFB MW-024 12/11/84 1030 ET
66) 85-5126 Dover AFB MW-025 12/11/84 1100 ET
67) 85-5127 Dover AFB MW-027 12/11/84 1430 ET
68) 85-5128 Dover AFB MW-001 12/11/84 ET
69) 85-5129 Dover AFB MW-002 12/11/84 1330 ET
70) 85-5130 Dover AFB MW-003 12/11/84 1400 ET
71) 85-5131 Dover AFB QA-12 12/11/84 ET
72) 85-5132 Dover AFB QA-13 12/11/84 ET
73) 85-5133 Dover AFB QA-14 12/11/84 1430 ET
74) 85-5143 Dover AFB MW-024 12/11/84 1030 ET

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75) 85-5144 Dover AFB MW-025 12/11/84 1100 ET
76) 85-5145 Dover AFB MW-027 12/11/84 ET
77) 85-5146 Dover AFB QA-12 12/11/84 ET
78) 85-5147 Dover AFB QA-13 12/11/84 ET
79) 85-4148 Dover AFB QA-14 12/11/84 1430 ET
80) 85-5281 Dover AFB SD-003 12/13/84 1130 ET
81) 85-5282 Dover AFB SD-004 12/13/84 1115 ET
82) 85-5283 Dover AFB SD-005 12/13/84 1050 ET
83) 85-5284 Dover AFB SD-006 12/13/84 1000 ET
84) 85-5285 Dover AFB SD-007 12/13/84 1035 ET
85) 85-5286 Dover AFB SD-008 12/13/84 0930 ET
86) 85-5287 Dover AFB SD-9 12/12/84
87) 85-5288 Dover AFB SD-10 12/12/84
88) 85-5289 Dover AFB SD-11 12/12/84
89) 85-5290 Dover AFB SD-12 12/12/84
90) 85-5338 Dover AFB SD-12 12/12/84
91) 85-5339 Dover AFB SW-012 12/12/84 ET
92) 85-5340 Dover AFB SW-013 12/12/84 ET
93) 85-5341 Dover AFB SW-014 12/12/84 ET
94) 85-5297 HAFB QA/QC 12/12/84 1300 Bailer Wash Vickers
95) 85-5298 HAFB QA/QC 12/12/84 1300 Blank Vickers
96) 85-5299 HAFB QA/QC 12/12/84 1300 Replicate well field #1 5530 Vickers
97) 85-5300 HAFB well field #1 12/12/84 well 5-530 Vickers
98) 85-5301 HAFB Well field #2 12/12/84 1410 well 10 Vickers
99) 85-5312 HAFB QA/QC 12/12/84 0920 Blank Vickers
100) 85-5313 HAFB QA/QC 12/12/84 0920 Bailer Wash Vickers
101) 85-5314 HAFB Well field #2 12/12/84 1410 well #10 Vickers
102) 85-5315 HAFB SP-4 12/12/84 0955 I-4 Vickers
103) 85-5316 HAFB SP-4 12/12/84 0900 I-5 Vickers
104) 85-5317 HAFB SP-4 12/12/84 0920 I-6 Vickers
105) 85-5318 HAFB QA/QC 12/12/84 0920 Replicate I-6 Vickers
106) 85-5319 HAFB SP-6 12/12/84 0830 I-14 Vickers
107) 85-5320 HAFB QA/QC 12/12/84 0920 Bailer Wash Vickers
108) 85-5321 HAFB QA/QC 12/12/84 0920 Blank Vickers
109) 85-5322 HAFB Well field #2 12/12/84 1410 Well #10 Vickers
110) 85-5323 HAFB SP-4 12/12/84 0955 I-4 Vickers
111) 85-5324 HAFB SP-4 12/12/84 0900 I-5 Vickers
112) 85-5325 HAFB SP-4 12/12/84 0920 I-6 Vickers
113) 85-5326 HAFB QA/QC 12/12/84 0920 Replicate I-6 Vickers
114) 85-5327 HAFB SP-6 12/12/84 0830 I-14 Vickers

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Sample	Total Organic Carbon	Purgeable Organic Carbon
	parts per million (mg/L)	
18	3.0	0.2
19	2.5	0.2
20	29.	0.2
21	12.	L/0.1
22	18.	0.2
27	13.	0.1
36	300.	58.
37	110.	16.
38	3.2	0.7
39	120.	11.
62	1.6	0.2
63	1.3	0.6
64	8.9	1.8
65	3.0	1.0
66	1.9	1.1
67	3.8	2.3
68	2.1	0.7
69	4.9	2.1
70	32.	1.6
71	0.4	0.1
72	0.7	L/0.1
73	4.7	2.2
90	4.4	0.8
91	4.9	0.2
92	4.1	L/0.1
93	5.3	L/0.1
99	0.4	L/0.1
100.	0.4	L/0.1
101	5.4	4.8
102	37.	26.
103	19.	11.
104	10.	6.1
105	12.	7.4
106	47.	30.

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Sample #	Cyanide, parts per million (mg/kg), dry basis
1	0.013
2	0.010
28*	0.010
29*	0.013
30*	L/0.005
31*	0.013
47	0.006
48	L/0.005
49	0.006
50	0.006
51	0.010
52	0.006
94	0.007
95	0.007
96	0.009
97	0.012
98	0.007

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parts per million (mg/L)

	3	4	32*	33*	34*
Phenol	44.	3.1	34.	0.026	L/0.005

	35*	74	75	76	77
Phenol	0.056	L/0.005	L/0.005	L/0.005	L/0.005

	78	79
Phenol	0.006	L/0.005

Sample #	% Total Solids	Sample #	% Total Solids
5	81.6	44	60.0
6	80.9	45	83.9
7	81.1	46	86.9
8	79.2	80	84.6
9	70.0	81	82.2
10	68.4	82	79.6
11	68.4	83	75.9
12	62.9	84	82.6
13	77.4	85	28.3
14	65.1	86	75.6
15	71.3	87	70.9
16	76.7	88	52.8
17	79.3	89	57.5

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Note: Balance of results to follow upon completion.

Key

L/ = "less than"
* = samples were received unpreserved

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J.M. Owens

JMO:veg

Laucks
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APPENDIX A

Replicate Quality Control Report

Sample	Analyte	Replicate 1	Replicate 2	% Relative Error	Control Limits
30	Cyanide	0.056	0.060	7.	0-13
98	Cyanide	0.064	0.058	10.	0-13
84	Phenol	0.049	0.048	2.	0-10
20	TOC	29.	31.	7.	0-9
63	TOC	1.3	1.4	7.	0-9
71	TOC	0.4	0.4	0.	0-9
103	TOC	19.	19.	0.	0-9

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APPENDIX B

Spike Quality Control Report

Sample	Analyte	Sample Found	Spike Level	Samp & Spike Found	% Recovery	Control Limit
30	Cyanide	L/0.005	0.050	0.056	112.	72-114
98	Cyanide	0.007	0.050	0.058	102.	72-114
34	Phenol	L/0.005	0.050	0.049	98.	
21	TOC	12.	10.	23.	110.	83-120
73	TOC	4.7	10.	15.	103.	83-120

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CLIENT Science Applications International Corporation
476 Prospect Street
La Jolla, CA 92038
ATTN: Dana Errett

LABORATORY NO 87860-b

DATE Feb. 19, 1985

PO #11-850423-38

REPORT ON WATER & SOIL

SAMPLE IDENTIFICATION Samples are identified as shown in report #87860-a, dated Feb. 12, 1985.

TESTS PERFORMED AND RESULTS

Total Organic Halogens as Cl

Sample Number	parts per million (mg/kg), dry basis
5	2.9
6	1.8
7	1.1
8	0.26
9	0.96
10	1.1
11	0.98
12	0.97
13	0.63
14	0.89
15	0.65
16	0.53
17	0.24
44	16.
45	0.12
46	0.18
80	0.15
81	L/0.1
82	0.31
83	0.20
84	0.27
85	1.8
86	2.1
87	3.1
88	0.89
89	0.59

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LABORATORY NO 87860-b

SAI

Total Organic Halogens as Cl

Sample Number	parts per million (mg/L)
23	0.094
24	0.066
25	0.066
26	0.094
40	1.2
41	1.2
42	0.10
43	1.5
53	0.12
54	0.13
55	0.12
56	0.10
57	1.0
58	1.4
59	0.10
60	0.10
61	8.2
107	0.041
108	0.039
109	0.039
110	0.044
111	0.10
112	0.049
113	0.052
114	0.036

Key

L/ = less than

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J.M. Owens

JMO:veg

Laucks
Testing Laboratories, Inc.
940 South Harney Street. Seattle. Washington 98108 (206)767-5060

Chemistry Microbiology and Technical Services

Certificate

CLIENT Science Applications International Corporation
476 Prospect Street
La Jolla, CA 92038
ATTN: Dana Errett

LABORATORY NO 87905-a

DATE Feb. 12, 1985

PO #11-850423-38

REPORT ON WATER & SOIL

SAMPLE IDENTIFICATION Submitted 12/21/84 and identified as shown:

TESTS PERFORMED AND RESULTS

1) 85-5441 HAFB FPTA-2 12/13/84 1355 248 Vickers
2) 85-5442 HAFB FPTA-2 12/13/84 1420 I-13 Vickers
3) 85-5443 HAFB SP-5 12/13/84 1435 1-19 Vickers
4) 85-5444 HAFB QA/QC 12/13/84 1435 Bailer Wash Vickers
5) 85-5445 HAFB QA/QC 12/13/84 1235 Replicate 1-19 Vickers
6) 85-5446 HAFB QA/QC 12/13/84 1435 Blank Vickers
7) 85-5447 HAFB SP-5 12/13/84 1500 I-18 Vickers
8) 85-5448 HAFB FPTA-2 12/13/84 1355 248 Vickers
9) 85-5449 HAFB FPTA-2 12/13/84 1420 I-13 Vickers
10) 85-5450 HAFB SP-5 12/13/84 1435 I-19 Vickers
11) 85-5451 HAFB QA/QC 12/13/84 1435 Bailer Wash Vickers
12) 85-5452 HAFB QA/QC 12/13/84 1435 Replicate I-19 Vickers
13) 85-5453 HAFB QA/QC 12/13/84 1435 Blank Vickers
14) 85-5454 HAFB SP-5 12/13/84 1500 I-18 Vickers
15) 85-5071 HAFB SP-1 12/10/84 0905 SL-1 Vickers
16) 85-5072 HAFB SP-1 12/10/84 0910 SL-2 Vickers
17) 85-5073 HAFB SP-1 12/10/84 0920 SL-3 Vickers
18) 85-5074 HAFB SP-1 12/10/84 0920 SL-4 Vickers
19) 85-5075 HAFB QA/QC 12/10/84 0930 SP-1, SL-4 Vickers
20) 85-5302 HAFB SP-1 12/12/84 1200 SD-2 Vickers
21) 85-5303 HAFB SP-1 12/12/84 1150 SD-1 Vickers
22) 85-5304 HAFB QA/QC 12/12/84 1200 SP-1, SD02 Vickers
23) 85-4054 ~~HAFB~~ 55 1-SB-1 11/6/84 1009 2.5'-4.0' BLS Vickers
24) 85-4055 1-SB-2 11/6/84 1015 4.0-5.3 BLS interval
25) 85-4056 1-SB-3 11/6/84 0929 4.5-5.0 BLS interval Refusal @ 5
26) 85-4057 7-SB-2R 11/6/84 1428
27) 85-4058 12-SB-1 11/6/84 1310
28) 85-4059 12-SB-2 11/6/84 1159
29) 85-4914 10-1DR 11/6/84 Drumard Cuttings from well
30) 85-4915 4-3DR Drumard Cuttings from well
31) 85-5208 Dover AFB SD-1 12/12/84 EFT
32) 85-5209 Dover AFB SD-2 12/12/84 EFT
33) 85-5210 Dover AFB QA-17 12/12/84 EFT 1000
34) 85-5218 Dover AFB SD-9 12/12/84 EFT

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LABORATORY NO 87905-a

35) 85-5219 Dover AFB SD-10 12/12/84 EFT
36) 85-5220 Dover AFB SD-11 12/12/84 EFT
37) 85-5221 Dover AFB Sd-12 12/12/84 EFT
38) 85-5291 Dover AFB 0052-50-003 GL-84 12/13/84 1130 EFT
39) 85-5292 Dover AFB 0052-50-004 GL-84 12/13/84 1115 EFT
40) 85-5293 Dover AFB 0052-50-005 GL-84 12/13/84 1050 EFT
41) 85-5294 Dover AFB 0052-50-006 GL-84 12/13/84 1000 EFT
42) 85-5295 Dover AFB 0052-50-007 GL-84 12/13/84 0935 EFT
43) 85-5296 Dover AFB 0052-50-008 GL-84 12/13/84 0930 EFT
44) 85-5385 Dover AFB SD-17 12/14/84 9:05 EFT
45) 85-5386 Dover AFB SD-019 12/14/84
46) 85-5391 Dover AFB SL-13 12/13/84 EFT
47) 85-5392 Dover AFB SL-14 12/13/84 EFT
48) 85-5393 Dover AFB SL-15 12/13/84 EFT
49) 85-5394 Dover AFB SL-16 12/13/84 EFT
50) 85-5395 Dover AFB QA-20 12/14/84 0900 EFT
51) 85-5396 Dover AFB SD-020 12/14/84 0900 EFT
52) 85-5397 Dover AFB SD-021 12/14/84 0900 EFT
53) 85-5398 Dover AFB SD-022 12/14/84 0900 EFT
54) 85-5399 Dover AFB SD-023 12/14/84 0900 EFT
55) 85-5400 Dover AFB SD-024 12/14/84 0900 EFT
56) 85-5401 Dover AFB SD-025 12/14/84 0900 EFT
57) 85-5402 Dover AFB SD-026 12/14/84 0900 EFT
58) 85-5403 Dover AFB SD-027 12/14/84 0900 EFT

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LABORATORY NO 87905-a

Samples 29 & 30 were analyzed in accordance with 40 CFR, Part 261.24 for EP Toxicity, with results as shown below:

	concentration, mg/L (parts per million)		
	29	30	MCL
Arsenic	L/0.1	L/0.1	5.0
Barium	1.0	0.5	100.
Cadmium	0.04	0.04	1.0
Chromium	L/0.1	0.1	5.0
Lead	0.4	0.6	5.0
Mercury	L/0.005	L/0.005	0.2
Selenium	L/0.1	L/0.1	1.0
Silver	L/0.1	L/0.1	5.0

Samples were further tested as follows:

	1	2	3	4	5	6	7
	parts per million (mg/L)						
Total Organic Carbon	2.2	5.6	7.0	0.6	9.4	1.2	22.
Purgeable Organic Carbon	0.5	1.9	3.8	0.1	5.9	0.3	14.

Total Organic Carbon, %

23	24	25	26	27	28	31
2.0	L/0.1	0.6	1.0	0.6	0.6	3.2

32	33	34	35	36	37	38
1.2	L/0.1	0.3	1.8	2.3	1.3	0.3

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Total Organic Carbon, %

39	40	41	42	43	44	45
0.9	0.1	2.2	L/0.1	4.4	0.2	0.9

46	47	48	49	50	51	52
0.3	1.1	1.4	0.3	4.1	2.3	4.8

53	54	55	56	57	58
2.4	4.2	3.4	4.6	1.3	1.5

Sample #	Cyanide, parts per million (mg/kg), dry basis	Total Solids, %
15	1.3	72.9
16	0.6	91.1
17	0.7	82.1
18	0.8	73.3
19	0.8	72.2
20	3.0	83.8
21	0.6	87.0
22	3.9	84.0
31	0.2	80.6
32	0.2	83.9
33	0.2	84.9
38	0.2	75.8
39	0.7	78.1
40	0.2	79.4

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LABORATORY NO 87905-a

Sample #	Cyanide, parts per million (mg/kg), dry basis	Total Solids, %
41	0.8	57.3
42	0.1	78.7
43	1.1	30.0
46	0.3	83.0
47	0.4	82.8
48	0.4	79.0
49	0.1	70.0

parts per million (mg/kg), dry basis

	31	32	33	38	39
Phenol	3.2	0.1	L/0.1	0.3	L/0.1

	40	41	42	43	46
Phenol	L/0.1	0.1	L/0.1	0.5	L/0.1

	47	48	49
Phenol	L/0.1	0.9	0.8

Laucks
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940 South Harney Street. Seattle. Washington 98108 (206) 767-5060

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LABORATORY NO 87905-a

parts per million

	8	9	10	11
Total Organic Halogens as Cl	0.025	2.2	0.026	0.020

	12	13	14
Total Organic Halogens as Cl	0.025	0.018	0.046

	27	28
Total Organic Halogens as Cl, dry basis	0.10	0.10

Key

L/ = "less than"
MCL = Maximum Contamination allowed per regulation.

Note: Balance of results to follow upon completion.

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J.M. Owens

JMO:veg

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Certificate

SAI

LABORATORY NO 87905-a

APPENDIX A

Replicate Quality Control Report

Sample	Analyte	Replicate 1	Replicate 2	% Relative Error	Control Limits
16	Cyanide	1.4	1.3	7.	0-10
1	TOC	2.0	2.2	10.	*
31	Phenol	9.4	9.3	1.	0-10
49	TOC	0.3	0.3	(0.)	*
8	TOX	0.025	0.027	(0.002)	*
10 spike	TOX	0.042	0.038	(0.004)	*
34	TOC	0.3	0.4	(0.1)	*
37	TOC	1.3	1.6	21.	*
43	TOC	4.4	4.7	6.6	*
52	TOC	4.8	5.5	14.	*
58	TOC	1.6	1.5	6.4	*

parentheses () indicate absolute, rather than relative, error.
* indicates none established

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Certificate

SAI

LABORATORY NO 87905-a

APPENDIX B

Spike Quality Control Report

Sample	Analyte	Sample Found	Spike Level	Samp & Spike Found	% Recovery
16	Cyanide	0.6	1.0	1.4	80.
1	TOC	2.2	10.	13.	108.
31	Phenol	3.2	6.2	9.4	100.
10	TOX	0.026	0050	0.042	32.
10	TOX	0.026	0.050	0.038	24.

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CLIENT Science Applications International Corporation
476 Prospect Street
La Jolla, CA 92038
ATTN: Dana Errett

LABORATORY NO 88149

DATE Feb. 13, 1985

PO #11-850423-38

REPORT ON WATER & SOIL

SAMPLE IDENTIFICATION Submitted 1/17/85 and identified as shown:

TESTS PERFORMED AND RESULTS

1) 85-4029
2) 85-4030
3) 85-4031
4) 85-4032
5) 85-4033
6) 85-4034
7) 85-4035
8) 85-4036
9) 85-4060
10) 85-4061
11) 85-4062
12) 85-4063
13) 85-4064
14) 85-5687 2-812-06-18C-56 Dover AFB DR-1 1/9/85 Drum Cuttings
15) 85-5688 2-812-06-18C-56 Dover AFB DR-1 1/9/85 Drum Cuttings

Sample #15 was analyzed in accordance with 40 CFR, Part 261.24 for EP Toxicity, with results as shown below:

	concentration, mg/L (parts per million)	
	15	MCL
Arsenic	L/0.1	5.0
Barium	L/0.5	100.
Cadmium	L/0.02	1.0
Chromium	L/0.1	5.0
Lead	L/0.2	5.0
Mercury	L/0.005	0.2
Selenium	L/0.1	1.0
Silver	L/0.1	5.0

Laucks
Testing Laboratories, Inc.
940 South Harney Street, Seattle, Washington 98108 (206) 767-5060

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LABORATORY NO 88149

Samples were further tested as follows:

parts per million (mg/kg), dry basis

	1	2	3	4	5	6
Total Organic Halogens as Cl	3.5	2.6	2.5	4.4	2.4	3.8
	7	8	9	10	11	12
Total Organic Halogens as Cl	3.3	3.4	4.0	2.4	2.2	2.8

%, dry basis

	1	2	3	4	5	6
Total Organic Carbon	0.4	L/0.1	L/0.1	1.2	1.3	1.5
	7	8	9	10	11	12
Total Organic Carbon	3.5	1.6	2.8	3.2	4.5	3.6

%

	1	2	3	4	5	6
Total Solids	82.4	81.9	87.0	81.0	86.0	81.2
	7	8	9	10	11	12
Total Solids	90.0	79.8	80.9	92.0	90.9	89.0

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	13
	parts per million (mg/L)
Total Organic Halogens as Cl	L/0.02
Total Organic Carbon	1.6

Sample #14 was tested for ignitability with the following result:

The sample is a solid and is not capable under standard conditions of causing fire through friction, absorption of moisture, or spontaneous chemical changes. The sample will not ignite or burn even when exposed to heat and flame.

Key

L/ = "less than"
MCL = Maximum Contamination allowed per regulation.

Respectfully submitted,

Laucks Testing Laboratories, Inc.

J. M. Owens

J.M. Owens

JMO:veg

Laucks
Testing Laboratories, Inc.
940 South Harney Street Seattle, Washington 98108 (206)767-5060
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SAI

LABORATORY NO 88149

APPENDIX A

Replicate Quality Control Report

Sample	Analyte	Replicate 1	Replicate 2	% Relative Error
2	TOX	2.4	2.6	8.
2	TOC	L/0.1	L/0.1	0.
8	TOC	1.6	1.6	0.

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SAI

LABORATORY NO 88149

APPENDIX B

Spike Quality Control Report

Sample	Analyte	Sample Found	Spike Level	Samp & Spike Found	% Recovery
2	TOX	2.6	6.1	9.0	105.

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940 South Harney Street. Seattle. Washington 98108 (206)767-5060

Chemistry Microbiology and Technical Services

Certificate

CLIENT Science Applications International Corporation
476 Prospect Street
La Jolla, CA 92038
ATTN: Dana Errett

LABORATORY NO 88149-b

DATE Feb. 20, 1985

PO #11-850423-38

REPORT ON SOIL

SAMPLE IDENTIFICATION Submitted 1/17/85 and identified as shown in our report #88149, dated Feb. 13, 1985.

TESTS PERFORMED AND RESULTS

Sample #15 was analyzed in accordance with 40 CFR, Part 261.24 for EP Toxicity, with results as shown below:

	concentration, mg/L (parts per million)	
	15	MCL
Lindane	L/0.0005	0.4
Endrin	L/0.0005	0.02
Methoxychlor	L/0.001	10.0
Toxaphene	L/0.005	0.5
2,4-D	L/0.001	10.0
2,4,5-TP	L/0.001	1.0

Key

L/ = "less than"
MCL = Maximum Contamination allowed per regulation.

Respectfully submitted,

Laucks Testing Laboratories, Inc

J.M. Owens

JMO:veg

I.D. 01-001815-18

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY
(EPA METHOD 8010 & 8020)

Client: Science Applications — Date Collected: 12-11-84

Sample I.D.: 85-5175 QA12 — Date Received by Lab: 12-28-84

Sample Matrix: Sediment — Date Analyzed: 1-8-85

µg/Kg		µg/Kg	
1.5	Benzene	54.9	Toluene
< 0.1	Bromodichloromethane	3.2	1,1,1-Trichloroethane
< 0.7	Bromoform	< 0.1	1,1,2-Trichloroethane
< 0.1	Bromomethane	2.9	Trichloroethene
< 0.1	Carbon Tetrachloride	ND	Trichlorofluoromethane
< 0.8	Chlorobenzene	< 0.2	Vinyl Chloride
< 0.8	Chloroethane		
< 0.2	2-Chloroethylvinylether		
< 0.1	Chloroform		
< 0.2	Chloromethane		
< 0.1	Dibromochloromethane		
13.0	1,2-Dichlorobenzene		
< 0.4	1,3-Dichlorobenzene		
< 0.6	1,4-Dichlorobenzene		
ND	Dichlorodifluoromethane		
3.6	1,1-Dichloroethane		
< 0.1	1,2-Dichloroethane		
< 0.1	1,1-Dichloroethene		
< 0.1	trans-1,2-Dichloroethene		
< 0.1	1,2-Dichloropropane		
< 0.1	cis-1,3-Dichloropropene		
< 0.1	trans-1,3-Dichloropropene		
< 0.1	Ethyl Benzene		
< 0.5	Methylene Chloride		
< 0.4	1,1,2,2-Tetrachloroethane		
4.5	Tetrachloroethene		

ND = Not Detected, limit of detection for this compound has not been fully evaluated.

I.D. 01-001815-9

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY
(EPA METHOD 8010 & 8020)

Client: Science Applications
Sample I.D.: 85-5176 SD-1
Sample Matrix: Sediment

Date Collected: 12-11-84
Date Received by Lab: 12-28-84
Date Analyzed: 1-8-85

µg/Kg		µg/Kg	
40.7	Benzene	658	Toluene
< 0.1	Bromodichloromethane	12.0	1,1,1-Trichloroethane
< 0.7	Bromoform	< 0.1	1,1,2-Trichloroethane
< 0.1	Bromomethane	65.5	Trichloroethene
< 0.1	Carbon Tetrachloride	ND	Trichlorofluoromethane
1.8	Chlorobenzene	< 0.2	Vinyl Chloride
< 0.8	Chloroethane		
< 0.2	2-Chloroethylvinylether		
< 0.1	Chloroform		
< 0.2	Chloromethane		
< 0.1	Dibromochloromethane		
273	1,2-Dichlorobenzene		
34.3	1,3-Dichlorobenzene		
< 0.6	1,4-Dichlorobenzene		
ND	Dichlorodifluoromethane		
202	1,1-Dichloroethane		
1.1	1,2-Dichloroethane		
8.2	1,1-Dichloroethene		
229	trans-1,2-Dichloroethene		
0.6	1,2-Dichloropropane		
< 0.1	cis-1,3-Dichloropropene		
< 0.1	trans-1,3-Dichloropropene		
< 0.1	Ethyl Benzene		
45.9	Methylene Chloride		
< 0.4	1,1,2,2-Tetrachloroethane		
105	Tetrachloroethene		

ND = Not Detected, limit of detection for this compound has not been fully evaluated.

I.D. 01-001815-20

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY
(EPA METHOD 8010 & 8020)

Client: Science Applications
Sample I.D.: 85-5177 SD-1
Sample Matrix: Sediment

Date Collected: 12-11-84
Date Received by Lab: 12-28-84
Date Analyzed: 1-8-85

µg/Kg	
< 0.2	Benzene
< 0.1	Bromodichloromethane
< 0.7	Bromoform
< 0.1	Bromomethane
< 0.1	Carbon Tetrachloride
< 0.8	Chlorobenzene
< 0.8	Chloroethane
< 0.2	2-Chloroethylvinylether
< 0.1	Chloroform
< 0.2	Chloromethane
< 0.1	Dibromochloromethane
1.2	1,2-Dichlorobenzene
< 0.4	1,3-Dichlorobenzene
0.6	1,4-Dichlorobenzene
ND	Dichlorodifluoromethane
< 0.1	1,1-Dichloroethane
< 0.1	1,2-Dichloroethane
< 0.1	1,1-Dichloroethene
< 0.1	trans-1,2-Dichloroethene
< 0.1	1,2-Dichloropropane
< 0.1	cis-1,3-Dichloropropene
< 0.1	trans-1,3-Dichloropropene
< 0.1	Ethyl Benzene
< 0.5	Methylene Chloride
< 0.4	1,1,2,2-Tetrachloroethane
4.5	Tetrachloroethene

µg/Kg	
< 0.4	Toluene
2.9	1,1,1-Trichloroethane
< 0.1	1,1,2-Trichloroethane
2.4	Trichloroethene
ND	Trichlorofluoromethane
< 0.2	Vinyl Chloride

ND = Not Detected, limit of detection for this compound has not been fully evaluated.

I.D. 01-001815-21

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY
(EPA METHOD 8010 & 8020)

Client: Science Applications — Date Collected: 12-11-84

Sample I.D.: 85-5387 — Date Received by Lab: 12-28-84

Sample Matrix: Sediment — Date Analyzed: 1-8-85

µg/Kg		µg/Kg	
< 0.2	Benzene	< 0.4	Toluene
< 0.1	Bromodichloromethane	2.4	1,1,1-Trichloroethane
< 0.7	Bromoform	< 0.1	1,1,2-Trichloroethane
< 0.1	Bromomethane	1.9	Trichloroethene
< 0.1	Carbon Tetrachloride	ND	Trichlorofluoromethane
< 0.8	Chlorobenzene	< 0.2	Vinyl Chloride
< 0.8	Chloroethane		
< 0.2	2-Chloroethylvinylether		
< 0.1	Chloroform		
< 0.2	Chloromethane		
< 0.1	Dibromochloromethane		
< 0.4	1,2-Dichlorobenzene		
< 0.4	1,3-Dichlorobenzene		
< 0.6	1,4-Dichlorobenzene		
ND	Dichlorodifluoromethane		
< 0.1	1,1-Dichloroethane		
< 0.1	1,2-Dichloroethane		
< 0.1	1,1-Dichloroethene		
< 0.1	trans-1,2-Dichloroethene		
< 0.1	1,2-Dichloropropane		
< 0.1	cis-1,3-Dichloropropene		
< 0.1	trans-1,3-Dichloropropene		
< 0.1	Ethyl Benzene		
< 0.5	Methylene Chloride		
< 0.4	1,1,2,2-Tetrachloroethane		
18.9	Tetrachloroethene		

ND = Not Detected, limit of detection for this compound has not been fully evaluated.

I.D. 01-001815-22

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY
(EPA METHOD 8010 & 8020)

Client: Science Applications | Date Collected: 12-11-84

Sample I.D.: 85-5388 SL IY | Date Received by Lab: 12-28-84

Sample Matrix: Sediment | Date Analyzed: 1-8-85

µg/Kg		µg/Kg	
< 0.2	Benzene	< 0.4	Toluene
< 0.1	Bromodichloromethane	2.3	1,1,1-Trichloroethane
< 0.7	Bromoform	< 0.1	1,1,2-Trichloroethane
< 0.1	Bromomethane	1.3	Trichloroethene
< 0.1	Carbon Tetrachloride	ND	Trichlorofluoromethane
< 0.8	Chlorobenzene	< 0.2	Vinyl Chloride
< 0.8	Chloroethane		
< 0.2	2-Chloroethylvinylether		
< 0.1	Chloroform		
< 0.2	Chloromethane		
< 0.1	Dibromochloromethane		
< 0.4	1,2-Dichlorobenzene		
< 0.4	1,3-Dichlorobenzene		
< 0.6	1,4-Dichlorobenzene		
ND	Dichlorodifluoromethane		
< 0.1	1,1-Dichloroethane		
< 0.1	1,2-Dichloroethane		
< 0.1	1,1-Dichloroethene		
< 0.1	trans-1,2-Dichloroethene		
< 0.1	1,2-Dichloropropane		
< 0.1	cis-1,3-Dichloropropene		
< 0.1	trans-1,3-Dichloropropene		
< 0.1	Ethyl Benzene		
< 0.5	Methylene Chloride		
< 0.4	1,1,2,2-Tetrachloroethane		
0.6	Tetrachloroethene		

ND = Not Detected, limit of detection for this compound has not been fully evaluated.

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY
(EPA METHOD 8010 & 8020

Client: Science Applications — Date Collected: 12-11-84

Sample I.D.: 85-5389 — Date Received by Lab: 12-28-84

Sample Matrix: Sediment — Date Analyzed: 1-8-85

µg/Kg		µg/Kg	
< 0.2	Benzene	< 0.4	Toluene
< 0.1	Bromodichloromethane	3.7	1,1,1-Trichloroethane
< 0.7	Bromoform	< 0.1	1,1,2-Trichloroethane
< 0.1	Bromomethane	2.3	Trichloroethene
< 0.1	Carbon Tetrachloride	ND	Trichlorofluoromethane
< 0.8	Chlorobenzene	< 0.2	Vinyl Chloride
< 0.8	Chloroethane		
< 0.2	2-Chloroethylvinylether		
< 0.1	Chloroform		
< 0.2	Chloromethane		
< 0.1	Dibromochloromethane		
< 0.4	1,2-Dichlorobenzene		
< 0.4	1,3-Dichlorobenzene		
< 0.6	1,4-Dichlorobenzene		
ND	Dichlorodifluoromethane		
< 0.1	1,1-Dichloroethane		
< 0.1	1,2-Dichloroethane		
< 0.1	1,1-Dichloroethene		
< 0.1	trans-1,2-Dichloroethene		
< 0.1	1,2-Dichloropropane		
< 0.1	cis-1,3-Dichloropropene		
< 0.1	trans-1,3-Dichloropropene		
< 0.1	Ethyl Benzene		
< 0.5	Methylene Chloride		
< 0.4	1,1,2,2-Tetrachloroethane		
5.2	Tetrachloroethene		

ND = Not Detected, limit of detection for this compound has not been fully evaluated.

I.D. 01-001815-24

VOLATILE ORGANIC ANALYSIS
DATA SUMMARY
(EPA METHOD 8010 & 8020)

Client: Science Applications | Date Collected: 12-11-84

Sample I.D.: 85-5390 SL-16 | Date Received by Lab: 12-28-84

Sample Matrix: Sediment | Date Analyzed: 1-8-85

µg/Kg		µg/Kg	
< 0.2	Benzene	< 0.4	Toluene
< 0.1	Bromodichloromethane	0.9	1,1,1-Tricnloroethane
< 0.7	Bromoform	< 0.1	1,1,2-Trichloroethane
< 0.1	Bromomethane	1.5	Trichloroethene
< 0.1	Carbon Tetrachloride	ND	Trichlorofluoromethane
< 0.8	Chlorobenzene	< 0.2	Vinyl Chloride
< 0.8	Chloroethane		
< 0.2	2-Chloroethylvinylether		
< 0.1	Chloroform		
< 0.2	Chloromethane		
< 0.1	Dibromochloromethane		
< 0.4	1,2-Dichlorobenzene		
< 0.4	1,3-Dichlorobenzene		
< 0.6	1,4-Dichlorobenzene		
ND	Dichlorodifluoromethane		
< 0.1	1,1-Dichloroethane		
< 0.1	1,2-Dichloroethane		
< 0.1	1,1-Dichloroethene		
< 0.1	trans-1,2-Dichloroethene		
< 0.1	1,2-Dichloropropane		
< 0.1	cis-1,3-Dichloropropene		
< 0.1	trans-1,3-Dichloropropene		
< 0.1	Ethyl Benzene		
102	Methylene Chloride		
< 0.4	1,1,2,2-Tetrachloroethane		
2.0	Tetrachloroethene		

ND = Not Detected, limit of detection for this compound has not been fully evaluated.

Analytical **Technologies,** Inc.

I.D. 01-001815

January 31, 1985

Science Applications International Corp.
476 Prospect Street
La Jolla, CA 92038

Attention: Dana Errett/Donna Mickelson

Purchase Order No.: 11-850453-38

On December 28, 1984 Analytical Technologies, Inc. received seven (7) sewer discharge samples, six (6) water samples, and eleven (11) sediment samples for analysis of volatile organic acids (VOA), cyanides (CN), chemical oxygen demand (COD), and phenol.

Analysis of VOA was performed by gas chromatography with Hall detector and photoionization detector, in accordance with EPA method 601,602 for the water samples and 8010, 8020 for the soil samples. Samples 85-5171, 85-5172, 85-5173, and 85-5174 were mostly liquid samples, and were analyzed in accordance with EPA methods 601 and 602. Analysis of phenol for five (5) of the sewer discharge samples was peformed by a direct photometric method, in accordance with Standard Methods for the Examination of Water and Waste water 510c. Analysis of COD for the seven (7) sewer discharge samples was performed by wet method in accordance with EPA method 410 and the analysis of CN for two (2) of the sewer discharge sample was performed by wet methods in accordance with EPA method 335.1.

Attached are the analytical results.

John W. Strand
Support Services Manager

Reviewed by
Mark King
Laboratory Manager

bimat

Attachments

NOTE: Samples from this project will be disposed of in thirty (30) days from the date of this report, unless we are informed otherwise.

ANALYTICAL REPORT

Project: A2776
Report Date: 03-02-85

ENVIRONMENTAL RESEARCH GROUP, INC.
117 N. FIRST
ANN ARBOR, MICHIGAN 48104 (313) 662-3104

Client P.O
Report: 12453

Client:
JRB ASSOCIATES, INC.
8400 WESTPARK DRIVE
MC LEAN, VA 22102
Attention: RICH EADES

Samples Recvd: 02-25-85
Refer Questions To:
THOMAS CULLEN

Approved: Thomas Cullen for RW.

***
Residual Samples Will Be Held
TWO WEEKS
***

Client I.D.: MW 010
ERG Sample No.: 02/125537
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	9.1	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	1.7	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	1.2	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	ND (0.05)	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	ND (0.05)	ug/L

 See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 010
ERG Sample No.: 02/125537
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

Client I.D.: MW 011
ERG Sample No.: 02/125538
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	83	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	11	ug/L
TOLUENE	8.8	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	6	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	0.67	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	700	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	39	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	2100	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	2700	ug/L
CHLOROBENZENE	ND (0.25)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 011
ERG Sample No.: 02/125538
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

Client I.D.: MW 012
ERG Sample No.: 02/125539
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	12	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	3.1	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	9	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	220	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	62	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	18	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	6.3	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L

See last page for explanation of symbols

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 012
ERG Sample No.: 02/125539
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

Client I.D.: MW 013
ERG Sample No.: 02/125540
Matrix: ELUTRIATE
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	24	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	360	ug/L
TOLUENE	24	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	620	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	2.8	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	15	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 013
ERG Sample No.: 02/125540
Matrix: ELUTRIATE
Date Sampled: 02-21-85

Parameter	Result	Units
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

Client I.D.: MW 021
ERG Sample No.: 02/125541
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	1.4	ug/L
TOLUENE	ND (0.3)	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	5.8	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	1.7	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	1.8	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 022
ERG Sample No.: 02/125542
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	2.1	ug/L
TOLUENE	ND (0.3)	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	0.1	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	0.48	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	1.4	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 023
ERG Sample No.: 02/125543
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	ND (0.3)	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	ND (0.05)	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	0.68	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	1.1	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 024
ERG Sample No.: 02/125544
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	0.72	ug/L
TOLUENE	0.29	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	0.1	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	0.23	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	0.50	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 025
ERG Sample No.: 02/125545
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	5.5	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	4.0	ug/L
TOLUENE	ND (0.3)	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	60	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	55	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	1400	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 027
ERG Sample No.: 02/125546
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	0.34	ug/L
TOLUENE	0.27	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	10	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	1.5	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	790	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	300	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	940	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: QA-1
ERG Sample No.: 02/125547
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	1.1	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	ND (0.05)	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	0.2	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	0.68	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: QA-2
ERG Sample No.: 02/125548
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	0.54	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	ND (0.05)	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	0.18	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	0.48	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: QA-3
ERG Sample No.: 02/125549
Matrix: GROUND WATER
Date Sampled: 02-21-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	23	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	570	ug/L
TOLUENE	56	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	640	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	0.53	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	3.0	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 001 J
ERG Sample No.: 02/125599
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	ND (0.3)	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	45	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	20	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	0.58	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	170	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	1500	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 002 J
ERG Sample No.: 02/125600
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	0.4	ug/L
TOLUENE	ND (0.3)	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	ND (0.05)	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	0.21	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	1.0	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 004 J
ERG Sample No.: 02/125601
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	ND (0.3)	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	ND (0.05)	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	0.14	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	0.49	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 101
ERG Sample No.: 02/125602
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	1.3	ug/L
TOLUENE	220	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	1.2	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	0.51	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	20	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	1.4	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 102
ERG Sample No.: 02/125603
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	8.0	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	10	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	0.74	ug/L
DICHLOROETHANE, 1,1-	48	ug/L
TRANS-1,2-DICHLOROETHYLENE	4.0	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	3.8	ug/L
TRICHLOROETHANE, 1,1,1-	4.7	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	14	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	3.5	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: MW 103
ERG Sample No.: 02/125604
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	97	ug/L
TOLUENE	42	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	25	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	240	ug/L
DICHLOROETHANE, 1,1-	350	ug/L
TRANS-1,2-DICHLOROETHYLENE	3900	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	20	ug/L
TRICHLOROETHANE, 1,1,1-	7700	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	80	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	13	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: SW 001
ERG Sample No.: 02/125605
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	22	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	14	ug/L
TOLUENE	610	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	9000	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	2.0	ug/L
DICHLOROETHANE, 1,1-	23	ug/L
TRANS-1,2-DICHLOROETHYLENE	7.1	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	0.5	ug/L
TRICHLOROETHANE, 1,1,1-	390	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	4.4	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	6.1	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: SW 002
ERG Sample No.: 02/125606
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	70	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	36	ug/L
TOLUENE	480	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	3.2	ug/L
DICHLOROETHANE, 1,1-	100	ug/L
TRANS-1,2-DICHLOROETHYLENE	48	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	2.0	ug/L
TRICHLOROETHANE, 1,1,1-	900	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	10	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	100	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: GA-4
ERG Sample No.: 02/125607
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	0.84	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	ND (0.05)	ug/L
CHLOROFORM	25	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	25	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	ND (0.05)	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	0.35	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: GA-5
ERG Sample No.: 02/125608
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	ND (0.3)	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	0.76	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	ND (0.25)	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	ND (0.05)	ug/L
DICHLOROETHANE, 1,1-	ND (0.05)	ug/L
TRANS-1,2-DICHLOROETHYLENE	ND (0.05)	ug/L
CHLOROFORM	20	ug/L
DICHLORETHANE, 1,2-	ND (0.05)	ug/L
TRICHLOROETHANE, 1,1,1-	ND (0.05)	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	25	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	ND (0.05)	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	0.2	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.

ANALYTICAL REPORT

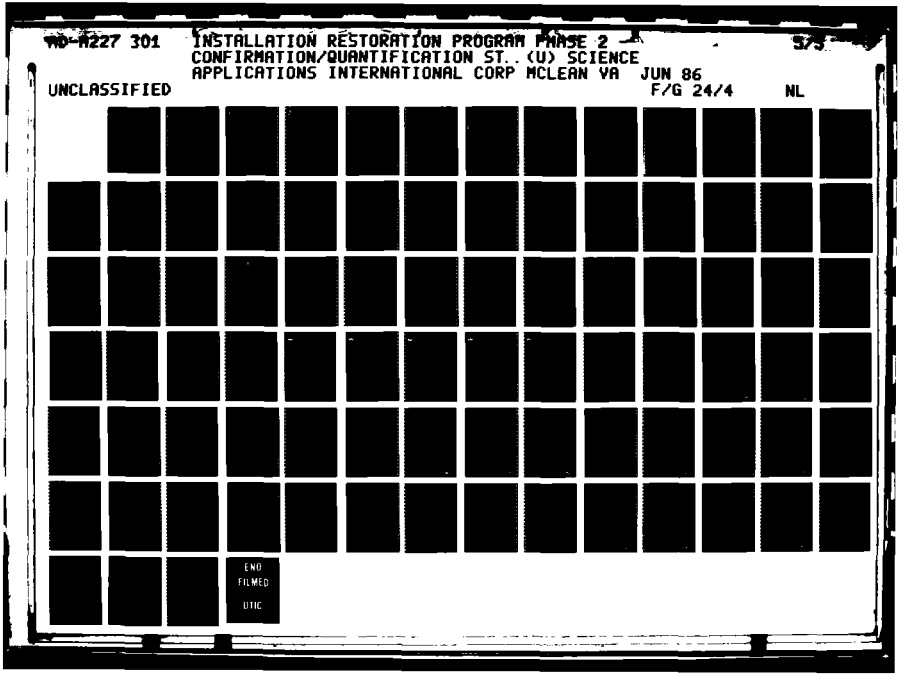
ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: GA-6
ERG Sample No.: 02/125609
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	1.7	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	4.3	ug/L
TOLUENE	78	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	100	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	450	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	830	ug/L
DICHLOROETHANE, 1,1-	720	ug/L
TRANS-1,2-DICHLOROETHYLENE	4400	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	57	ug/L
TRICHLOROETHANE, 1,1,1-	5700	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	240	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	30	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

See last page for explanation of symbols.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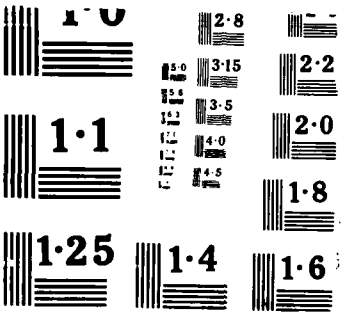
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ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

Project: A2776
Report Date: 03-02-85

Client I.D.: GA-7
ERG Sample No.: 02/125610
Matrix: GROUND WATER
Date Sampled: 02-22-85

Parameter	Result	Units
PURGEABLE AROMATICS		
BENZENE	19	ug/L
1,2-DICHLOROBENZENE	ND (0.15)	ug/L
1,3-DICHLOROBENZENE	ND (0.32)	ug/L
1,4-DICHLOROBENZENE	ND (0.24)	ug/L
ETHYLBENZENE	ND (0.3)	ug/L
TOLUENE	620	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
PURGEABLES, 601		
CHLOROMETHANE	ND (0.08)	ug/L
BROMOMETHANE	ND (1.2)	ug/L
DICHLORODIFLUOROMETHANE	ND (1.8)	ug/L
VINYL CHLORIDE	ND (0.2)	ug/L
CHLOROETHANE	ND (0.52)	ug/L
METHYLENE CHLORIDE	23000	ug/L
TRICHLOROFLUOROMETHANE	ND (0.1)	ug/L
DICHLOROETHYLENE, 1,1-	19	ug/L
DICHLOROETHANE, 1,1-	41	ug/L
TRANS-1,2-DICHLOROETHYLENE	130	ug/L
CHLOROFORM	ND (0.05)	ug/L
DICHLORETHANE, 1,2-	0.81	ug/L
TRICHLOROETHANE, 1,1,1-	880	ug/L
CARBON TETRACHLORIDE	ND (0.12)	ug/L
BROMODICHLOROMETHANE	ND (0.1)	ug/L
DICHLOROPROPANE, 1,2-	ND (0.04)	ug/L
TRANS-1,3-DICHLOROPROPENE	ND (0.34)	ug/L
TRICHLOROETHYLENE	8.0	ug/L
DIBROMOCHLOROMETHANE	ND (0.09)	ug/L
TRICHLOROETHANE, 1,1,2-	ND (0.02)	ug/L
CIS-1,3-DICHLORPROPENE	ND (0.2)	ug/L
CHLOROETHYLVINYL ETHER, 2-	ND (0.13)	ug/L
BROMOFORM	ND (0.20)	ug/L
TETRACHLOROETHANE, 1,1,2,2-	ND (0.03)	ug/L
TETRACHLOROETHYLENE	7.1	ug/L
CHLOROBENZENE	ND (0.25)	ug/L
DICHLOROBENZENE, 1,3-	ND (0.32)	ug/L
DICHLOROBENZENE, 1,2-	ND (0.15)	ug/L
DICHLOROBENZENE, 1,4-	ND (0.24)	ug/L

SD-Sample damaged
FR-See field report for result
SR-See attached report
NA-Result not applicable to test

ND-Nondetected, Detection limit in ()
<-Positive result at an unquantifiable concentration below indicated level

Thank you for your business.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.
117 N. FIRST
ANN ARBOR, MICHIGAN 48104 (313) 662-3104

PROJECT A1998
REPORT DATE 06-11-84

CLIENT P.O.: LETTER
REPORT: 7489

SAMPLES RECVD: 05-18-84
REFER TECHNICAL QUESTIONS
TO: FRANK T. HAMMER

CLIENT:
JRB ASSOCIATES, INC
8400 WESTPARK DRIVE
MC LEAN, VA 22102

ATTENTION: CLAUDIA WIEGAND

APPROVED:

***
RESIDUAL SAMPLES WILL
BE HELD FOR TWO WEEKS
***

CLIENT I.D.: FHA-1
ERG SAMPLE NO: 05/108248
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	7	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
OIL AND GREASE BY IR	ND (1)	mg/L

CLIENT I.D.: DAFB-A
ERG SAMPLE NO: 05/108249
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
OIL AND GREASE BY IR	ND (1)	mg/L

CLIENT I.D.: DAFB-B
ERG SAMPLE NO: 05/108250
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. A1998 - JRB ASSOCIATES, INC 06-11-84

CLIENT I.D.: DAFB-B
ERG SAMPLE NO: 05/108250
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
OIL AND GREASE BY IR	ND (1)	mg/L

CLIENT I.D.: DAFB-C
ERG SAMPLE NO: 05/108251
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.26	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
OIL AND GREASE BY IR	<1	mg/L

CLIENT I.D.: DAFB-D
ERG SAMPLE NO: 05/108252
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	4	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.006)	mg/L
OIL AND GREASE BY IR	1	mg/L

CLIENT I.D.: MW-1
ERG SAMPLE NO: 05/108253
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. A1998 - JRB ASSOCIATES, INC 06-11-84

CLIENT I.D.: MW-1
ERG SAMPLE NO: 05/108253
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
ORGANIC BROMIDE	0.007	mg/L
ORGANIC IODINE	0.012	mg/L
OIL AND GREASE BY IR	ND (1)	mg/L

CLIENT I.D.: MW-2
ERG SAMPLE NO: 05/108254
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	8	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.07	mg/L
ORGANIC BROMIDE	0.007	mg/L
ORGANIC IODINE	0.043	mg/L
OIL AND GREASE BY IR	ND (1)	mg/L

CLIENT I.D.: MW-3
ERG SAMPLE NO: 05/108255
MATRIX: NATURAL WATER
DATE COLLECTED: 05-17-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	15	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	16	mg/L
ORGANIC BROMIDE	ND (0.004)	mg/L
ORGANIC IODINE	0.027	mg/L
COMMENTS: HIGHER BR DETECTION LIMIT DUE TO INTERFERENCE FROM HIGH CL CONTENT.		
OIL AND GREASE BY IR	ND (1)	mg/L

FR - SEE FIELD REPORT FOR RESULT
NA - NOT APPLICABLE TO TEST REQUESTED
ND - NONDETECTED, DETECTION LIMIT IN ()
SD - SAMPLE DAMAGED
SR - SEE ATTACHED REPORT FOR RESULT
< - POSITIVE RESULT BUT AT UNQUANTIFIABLE CONCENTRATION BELOW INDICATED LEVEL

THANK YOU FOR YOUR BUSINESS !

DOCUMENT CONTROL

SAMPLE CONTROL RECORD

ERG PROJECT NO. A1998

Project Name JRB - Dover AFB

PARAMETER	SAMPLE NUMBERS	SIGNATURE OF ANALYST RESPONSIBLE FOR SAMPLES	DATE	TIME OUT	DATE	TIME IN
TOX	108248-255	Tom Symbol	5-21-84	9 am		
Od Gr IR	108248-255	Cindy Dang	5-23-84	4 p.m.	5-23-84	8 pm
TOC	108248-255	Cindy Dang	6/2/84	1105 am	6/4/84	545 PM

PROJECT NAME: DAFB PROJECT NUMBER: 2-812-06-351-54 PAGE 1 OF 1

COLLECTION LOCATION: DOVER AFB SAMPLERS: ED. TOKARSKI, M. WICKLINE

SAMPLE NUMBER	DATE	TIME	SAMPLE TYPE	# OF CONTAINERS	PRESERVATIVES ADDED	REMARKS
FHA-1	5/17	1410	GROUND W.	3	See Bottle.	TOX, TOC, O+G.
DAFB-A	5/17	1440	"	"	"	"
DAFB-B	"	1470	"	"	"	"
DAFB-C	"	1435	"	"	"	"
DAFB-D	"	1500	"	"	"	"
MW-1	"	1545	"	"	"	"
MW-2	"	1670	"	"	"	"
MW-3	"	1630	"	"	"	"
				24 TOTAL		

RELINQUISHED BY: ED TOKARSKI	DATE/TIME: 5/17/84 1715 REASON: Shipping	RECEIVED BY: M.B. 5117
RELINQUISHED BY: (FEDERAL EXPRESS DELIVERYMAN)	DATE/TIME: 5/18/84 1020 REASON: RECEIVED AT ERG INC FROM FEDERAL EXPRESS	RECEIVED BY: Greg Laycock
RELINQUISHED BY: Greg Laycock	DATE/TIME: 5/18/84 1400 REASON: TRANSFERED CUSTODY TO SAMPLE CUSTODIAN.	RECEIVED BY: Walt K Wilcox
RELINQUISHED BY:	DATE/TIME: _____ REASON:	RECEIVED BY:

QUALITY CONTROL SUMMARY

Submitted To:

JRB Associates, Inc.
8400 Westpark Drive
McLean, VA 22102

Attn: Claudia Wiegand

Project Number:	A1998 Reference: JRB-Dover
Date Sample Received:	May 20, 1984
Date Sample Extracted:	No extraction
Date Samples Analyzed:	May 23, 1984, and June 1, 2, 1984
Methodology Employed:	Halocarbon Purgeables EPA Method 601 EPA 600 Method for chemical analysis of water and wastes Methods 416.1, 413.2.
Sample Quality Control:	ERG's QA/QC requires a duplicate, method spike and blank with each group of samples or with every 10 samples, whichever is larger.

Enclosed is the Quality Control Summary.

QUALITY CONTROL REPORT

JRB-DOVER: A1998

SAMPLE NUMBER	PARAMETER	DUPLICATE* VALUE	BLANK VALUE	METHOD SPIKE VALUE	SPIKE LEVEL	RECOVERY %
108255	TOC	14.3/16.6	ND(2)	36.2	20	105
108248	Bromide	ND(0.002)/ND(0.002)	0	10.2	10	102
108248	Chloride	0.01/0.02	0	100	104	104
108248	Iodide	ND(0.002)/ND(0.002)	0	10	9.9	99
------	**Oil & Grease	----------	------	------	-----	-------

* All analytical results are blank subtracted.

** Oil & Grease there are no duplicates, analyze the entire sample.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.
117 N. FIRST
ANN ARBOR, MICHIGAN 48104 (313) 662-3104

PROJECT A2012
REPORT DATE 07-18-84

CLIENT P.O.: LETTER
REPORT: 8221

SAMPLES RECVD: 05-30-84
REFER TECHNICAL QUESTIONS TO: FRANK T. HAMMER

APPROVED:

CLIENT:
JRB ASSOCIATES, INC
8400 WESTPARK DRIVE
MC LEAN, VA 22102

ATTENTION: CLAUDIA WIEGAND

***
RESIDUAL SAMPLES WILL BE HELD FOR TWO WEEKS
***

CLIENT I.D.: WELL #2 LEBANON
ERG SAMPLE NO: 05/109067
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
OIL AND GREASE BY IR	ND (0.5)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L

THE TOX ALIQUOT WAS BROKEN IN TRANSIT.

SR - SEE FIELD REPORT FOR RESULT
NA - NOT APPLICABLE TO TEST REQUESTED
ND - NONDETECTED, DETECTION LIMIT IN ()
SD - SAMPLE DAMAGED
SR - SEE ATTACHED REPORT FOR RESULT
J - POSITIVE RESULT BUT AT UNQUANTIFIABLE CONCENTRATION BELOW INDICATED LEVEL

THANK YOU FOR YOUR BUSINESS !

QUALITY CONTROL SUMMARY

Submitted To:

JRB Associates, Inc.
8400 Westpark Drive
McLean, VA 22102

ATTN: Claudia Wiegand

Project Number:	A2012 Reference: JRB-Dover
Date Samples Received:	May 30, 1984
Date Samples Extracted:	No extraction
Date Samples Analyzed:	June 8, 1984 June 15, 1984
Methodology Employed:	EPA Method for chemical analysis of water and wastes. Method 413.2, 416.1
Sample Quality Control:	ERG's QA/QC requires a duplicate, method spike and blank with each group of samples or with ever- 10 samples, whichever is larger.

Enclosed is the Quality Control Summary.

QUALITY CONTROL REPORT

JRB DOVER: #A2012

SAMPLE NUMBER	PARAMETER	DUPLICATE VALUE	BLANK VALUE	METHOD SPIKE VALUE	SPIKE LEVEL	% RECOVERY
**109409	TOC	2.5/2.3	ND(2)	20	23.5	105
	* O & G	-------	ND(.5)	--	----	---

* Oil & Grease: No duplicates, analyze entire sample.

** This sample number is not part of project A2012 but was analyzed with the sample of project #A2012.

28 JUL 1984 13J

LABORATORY ANALYSIS REPORT AND RECORD (General)

DATE: 16 Jul 84

TO:

FROM: USAF OEHL/SA
Brooks AFB TX 78235

SAMPLE IDENTITY: WATER

DATE RECEIVED: 10 Jul 84

SAMPLE FROM:

LAB CONTROL NR:

TEST FOR: Volatile Halocarbons

Methodology: EPA Method 601 Test well #1 / Test well #2 Test well #3

OEHL NO:	37702.03	37704.05	37706.07	37708,09	DET.
BASE NO:	GP840272	GP840273	GP840274	GP840275	LIMIT
Bromodichloromethane	ND	ND	ND	ND	0.1
Bromoform					0.2
Bromomethane					1.0
Carbon Tetrachloride		ND	ND		0.1
Chlorobenzene		7.6	127		0.2
Chloroethane		ND	ND		0.5
2-Chloroethylvinyl ether	ND	ND		ND	0.1
Chloroform	2.9	0.9		0.4	0.1
Chloromethane	ND	ND		ND	0.1
Dibromochloromethane					0.1
1,2-Dichlorobenzene					0.2
1,3-Dichlorobenzene					0.2
1,4-Dichlorobenzene					0.2
Dichlorodifluoromethane	ND	ND	ND		0.1
1,1-Dichloroethane	0.6	4.1	205		0.2
1,2-Dichloroethane	ND	2.0	7.5		0.2
1,1-Dichloroethene	ND	ND	ND		0.1
trans-1,3-Dichloroethene	2.4	3.1	1800		0.1
1,2-Dichloropropane	ND	ND	ND		0.1
cis-1.3-Dichloropropene					0.2
trans-1.3-Dichloropropene		ND	ND		0.2
Methylene Chloride		0.2	101		0.2
1,1.2.2-Tetrachloroethane	ND	ND	ND		0.1
Tetrachloroethylene	36	12	2300		0.1
1,1.1-Trichloroethane	9.8	28	4250		0.1
1,1.2-Trichloroethane	ND	ND	ND		0.1
Trichloroethylene	38	140	2250		0.1
Trichlorofluoromethane	ND	ND	110		0.1
Vinyl Chloride	ND	ND	ND	ND	0.2

Results in Micrograms per Liter

analysis Reviewed 24 July 1984 as identified above this data does not agree with previous results conducting wells #2 & #3. Based on data above #2 well is more contaminated than #3. I assume the vials were not identified properly and data for well #2 is actually for #3 and vice versa.

LeROY P. GEORGE, GS-12
Chief, Trace Organics Section

ND-NONE DETECTED, LESS THAN THE DETECTION LIMIT.
TRACE-PRESENT BUT LESS THAN THE QUANTITATIVE LIMIT.

REQUESTING AGENCY (Mailing Address)

USAF HOSP/SGPB
DOVER AFB DE 19902-3006

LINDSEY C. WATERHOUSE, CAPT, USAF, BS
Bioenvironmental Engineer

AMD FORM SEP 82 641 REPLACES OEHL FORM 7, DEC 78, WHICH IS OBSOLETE.

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER 00028	4. REQUESTOR SAMPLE NO 00029
OEHL	39490	GL840277

SAMPLE COLLECTION INFORMATION			5. DATE RECEIVED BY LAB 13-Aug-84	6. DATE ANALYSIS COMPLETED 13 Aug, 84
7. SITE DESCRIPTION			ON-SITE ANALYTICAL RESULTS	
8. SITE LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER 00041	16. WATER TEMP °C	17. PH 00400 UNITS
11. COLLECTION DATE/PERIOD	12. COLLECTORS NAME		19. RESULTS OF OTHER ON-SITE ANALYSES	
13. SAMPLING TECHNIQUE	14. PHONE NUMBER			
15. REASON FOR SAMPLE SUBMISSION NPDES #				

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

(207) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/gram
OIL & GREASE FREON-IR Method	00560	7.5

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Ortho PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free, Amenable to Cl_2	00722	

(220) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/gram
PHENOLS	32730	0.4

(205) PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/gram
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	(01027)	57.2
CHROMIUM	01030	(01034)	18.5
CHROMIUM Hexavalent		01032	
COPPER	01040	(01042)	41.4
IRON	01045	(01045)	11240
LEAD	01049	(01051)	289
MANGANESE	01056	(01055)	166.9
MERCURY	71890	71900	
NICKEL	01065	(01067)	16.7
SELENIUM	01145	01147	
SILVER	01075	01077	
ZINC	01090	(01092)	2093
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS	CHEMIST EH WB SMS REL
	REVIEWED BY
	APPROVED BY

AMD FORM MAR 83 201

~~NON-POTABLE WATER ANALYSIS~~

Sludge

SF 12.03

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	39489	GL840276 00029

SAMPLE COLLECTION INFORMATION	5. DATE RECEIVED BY LAB	6. DATE ANALYSIS 13 COMPLETED
7. SITE DESCRIPTION	17 Jul 84	8 Aug. 84

ON-SITE ANALYTICAL RESULTS

8. SITE LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER	16. WATER TEMP °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L

11. COLLECTION DATE PERIOD	12. COLLECTORS NAME	19. RESULTS OF OTHER ON-SITE ANALYSES
		Sludge from lagoon #1
13. SAMPLING TECHNIQUE	14. PHONE NUMBER	
15. REASON FOR SAMPLE SUBMISSION		
NPDES #		

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

(20) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/Gram
OIL & GREASE FREON-IR Method	00560	420
		50 mg/L

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Ortho PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free, Amenable to Cl_2	00722	

(21) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/Gram
PHENOLS	32730	120

(205) PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/Gram
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	01027	631
CHROMIUM	01030	01034	3010
CHROMIUM Hexavalent		01032	
COPPER	01040	01042	373 1.2
IRON	01040	01045	2226
LEAD	01049	01051	2018 1.0
MANGANESE	01056	01055	88.0
MERCURY	71890	71900	
NICKEL	01065	01067	1.5 26.6
SELENIUM	01145	01147	
SILVER	01075	01077	5.7
ZINC	01090	01092	748
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS

Received 11 Sept. 84

Lindsey C. Waterhouse

USAF HOSP/SGPB
Dover AFB DE 19902

LINDSEY C. WATERHOUSE, Capt, USAF
Chief, Bioenvironmental Engineering
~~908-36-6870~~
~~USAF Hospital Dover~~

CHEMIST
EH SMS REL MS

REVIEWED BY

APPROVED BY

AMD FORM MAR 83 201

~~NON-POTABLE WATER~~ ANALYSIS

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	39492	GL840279 00029

SAMPLE COLLECTION INFORMATION

5. DATE RECEIVED BY LAB	17 Jul 84
6. DATE ANALYSIS COMPLETED	13 Aug. 84
7. SITE DESCRIPTION	
8. SITE LOCATION NO	
9. FLOWRATE AT SITE 00058 GAL/MIN	
10. WEATHER 00041	
11. COLLECTION DATE/PERIOD	
12. COLLECTOR'S NAME	
13. SAMPLING TECHNIQUE	
14. PHONE NUMBER	
15. REASON FOR SAMPLE SUBMISSION	NPDES #

ON-SITE ANALYTICAL RESULTS

16. WATER TEMP 00010 °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L

19. RESULTS OF OTHER ON-SITE ANALYSES: Sludge from lagoon #2

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

(207) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/Gram
OIL & GREASE FREON-IR Method	(00560)	435
		50 mg/L

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Ortho PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free, Amenable to Cl_2	00722	

(210) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/Gram
PHENOLS	(32730)	72
		4.0

PRESERVATION GROUP F (266)

PARAMETER	DISS	TOTAL	µG/L
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	(01027)	689
CHROMIUM	01030	(01034)	489
CHROMIUM Hexavalent		01032	
COPPER	01040	(01042)	72
IRON	01046	(01045)	6240
LEAD	01049	(01051)	2490
MANGANESE	01056	(01055)	2300
MERCURY	71890	71900	1.0
NICKEL	01065	(01067)	104
SELENIUM	01145	01147	
SILVER	01075	01077	1.0
ZINC	01090	(01092)	403
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS

CHEMIST: [illegible] REL

REVIEWED BY

APPROVED BY: [signature]

AMD FORM MAR 83 201

NON-POTABLE WATER ANALYSIS

SF 12.03

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	39491	GL840278 00029

SAMPLE COLLECTION INFORMATION	5. DATE RECEIVED BY LAB	6. DATE ANALYSIS COMPLETED
7. SITE DESCRIPTION	17 JUL 84	13 Aug 84

ON-SITE ANALYTICAL RESULTS

8. SITE LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER	11. WATER TEMP °C	12. PH 00400 UNITS	18. DISS O_2 00300 MG/L

11. COLLECTION DATE/PERIOD	12. COLLECTORS NAME	19. RESULTS OF OTHER ON-SITE ANALYSES
		Sludge from waste [illegible] Lagoon #1
13. SAMPLING TECHNIQUE	14. PHONE NUMBER	
15. REASON FOR SAMPLE SUBMISSION		
NPDES #		

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

(207) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/Gram
OIL & GREASE FREON-IR Method	(00560)	435
		Sum 1 L

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Ortho PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free, Amenable to Cl_2	00722	

(506) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/Gram
PHENOLS	(32730)	580
		4/m

(203) PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/Gram
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	(01027)	238
CHROMIUM	01030	(01034)	3673
CHROMIUM Hexavalent		01032	
COPPER	01040	(01042)	38.5
IRON	01040	(01045)	419.6
LEAD	01049	(01051)	2078
MANGANESE	01056	(01055)	17.7
MERCURY	71890	71900	
NICKEL	01065	(01067)	126.3
SELENIUM	01145	01147	
SILVER	01075	01077	
ZINC	01090	(01092)	128.6
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS

Received 11 Sept. 1984

Lindsey C. Waterhouse

LINDSEY C. WATERHOUSE, Capt, USN
Chief, Bioenvironmental Engineering
008-36-8670
~~USNH Hospital Dover~~

CHEMIST
EH S-3 DEL DB

REVIEWED BY

APPROVED BY

AMD FORM MAR 83 201

~~NON-POTABLE WATER~~ ANALYSIS

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	39494 00008	GL840281 00029

SAMPLE COLLECTION INFORMATION	5. DATE RECEIVED BY LAB	6. DATE ANALYSIS COMPLETED
7. SITE DESCRIPTION	17 JUL 84	13 AUG 84

8. SITE LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER 00041	ON-SITE ANALYTICAL RESULTS: 15. WATER TEMP 00010 °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L

11. COLLECTION DATE/PERIOD	12. COLLECTOR'S NAME	19. RESULTS OF OTHER ON-SITE ANALYSES
		Sludge from lagoon #2
13. SAMPLING TECHNIQUE	14. PHONE NUMBER	
16. REASON FOR SAMPLE SUBMISSION: NPDES #		

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

(207) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/gram
OIL & GREASE FREON-IR Method	(00560)	420

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Ortho PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free, Amenable to Cl_2	00722	

(220) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/gram
PHENOLS	(32730)	87

(206) PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/gram
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	(01027)	85.6
CHROMIUM	01030	(01034)	3357.
CHROMIUM Hexavalent		01032	
COPPER	01040	(01042)	100.8
IRON	01040	(01045)	1357.
LEAD	01049	(01051)	933.
MANGANESE	01056	(01055)	41.1
MERCURY	71890	71900	
NICKEL	01065	(01067)	8.9
SELENIUM	01145	01147	
SILVER	01075	01077	
ZINC	01090	(01092)	367.5
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS	CHEMIST: EH DBJ Smg REL
	REVIEWED BY:
	APPROVED BY:

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	39493	GL840280 00029

SAMPLE COLLECTION INFORMATION				5. DATE RECEIVED BY LAB	6. DATE ANALYSIS COMPLETED
7. SITE DESCRIPTION				17 Jul 84	13 Aug 84
				ON-SITE ANALYTICAL RESULTS	
8. SITE LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER 00047		11. WATER TEMP °C	12. PH 00400 UNITS	13. DISS O_2 00300 MG/L
11. COLLECTION DATE/PERIOD		12. COLLECTORS NAME		19. RESULTS OF OTHER ON-SITE ANALYSES: Sludge from Lagoon #2		
13. SAMPLING TECHNIQUE		14. PHONE NUMBER				
16. REASON FOR SAMPLE SUBMISSION NPDES #						

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

(207) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Method	(00560)	240.

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Ortho PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free, Amenable to Cl_2	00722	

(220) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/Gram
PHENOLS	(32730)	42

(204) PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/Gram
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	(01027)	165
CHROMIUM	01030	(01034)	298
CHROMIUM Hexavalent		01032	
COPPER	01040	(01042)	26.6
IRON	01040	(01045)	81.7
LEAD	01049	(01051)	132
MANGANESE	01056	(01055)	28.1
MERCURY	71890	71900	
NICKEL	01065	(01067)	6.1
SELENIUM	01145	01147	
SILVER	01075	01077	
ZINC	01090	(01092)	264.3
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

21. ORGANIZATION REQUESTING ANALYSIS	CHEMIST
Received 11 Sept. 84 Lindsey C. Waterhouse LINDSEY C. WATERHOUSE, Capt, USAF Chief, Bioenvironmental Engineering 008-36-6670 USAF Hospital Dover	EH Sub REL Sub REVIEWED BY APPROVED BY

AMD FORM MAR 83 201 — NON-POTABLE WATER ANALYSIS

SF 12.03

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	39495	GT840282 00029

SAMPLE COLLECTION INFORMATION	5. DATE RECEIVED BY LAB	6. DATE ANALYSIS COMPLETED
7. SITE DESCRIPTION	17 July 84	13 Aug 84

ON-SITE ANALYTICAL RESULTS

8. SITE LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER 00047	16. WATER TEMP °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L

11. COLLECTION DATE/PERIOD	12. COLLECTOR'S NAME	19. RESULTS OF OTHER ON-SITE ANALYSES
		Liquid from middle Pkg unit #1
13. SAMPLING TECHNIQUE	14. PHONE NUMBER	
15. REASON FOR SAMPLE SUBMISSION		
NPDES #		

ANALYSES REQUESTED AND RESULTS

(204)

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

(207) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Method	00560	8860.
		5

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Ortho PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free, Amenable to Cl_2	00722	

(355) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/L
PHENOLS	32730	27200.
		400

PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/L
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	01027	<10
CHROMIUM	01030	01034	664
CHROMIUM Hexavalent		01032	
COPPER	01040	01042	36
IRON	01046	01045	4880
LEAD	01049	01051	89
MANGANESE	01056	01055	215
MERCURY	71890	71900	
NICKEL	01065	01067	52
SELENIUM	01145	01147	
SILVER	01075	01077	
ZINC	01090	01092	119
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

7. ORGANIZATION REQUESTING ANALYSIS

Reviewed 11 Sept. 84

Lindsey C. Watkins

LINDSEY C. WATKINS

Chief, Bioenvironmental Engineering/SGPB

608-36-8670

CHEMIST

DoD EH Svcs Rel

REVIEWED BY

APPROVED BY

AMD FORM MAR 83 201 USAF Hospital Dover

NON-POTABLE WATER ANALYSIS

1. LABORATORY PERFORMING ANALYSIS	2. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	39496 00008	GT 840283 00029

SAMPLE COLLECTION INFORMATION	5. DATE RECEIVED BY LAB	6. DATE ANALYSIS COMPLETED
7. SITE DESCRIPTION	17 Jul 84	13 Aug. 84

ON-SITE ANALYTICAL RESULTS		
8. SITE LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER 00041
14. WATER TEMP 00010 °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L
11. COLLECTION DATE/PERIOD	12. COLLECTORS NAME	19. RESULTS OF OTHER ON-SITE ANALYSES: Liquid from middle of Basin #2
13. SAMPLING TECHNIQUE	14. PHONE NUMBER	
16. REASON FOR SAMPLE SUBMISSION: NPDES #		

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

(207) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Method	00560	210

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Ortho PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free, Amenable to Cl_2	00722	

(206) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/L
PHENOLS	32730	7600

(206) PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/L
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	01027	10
CHROMIUM	01030	01034	898
CHROMIUM Hexavalent		01032	
COPPER	01040	01042	33
IRON	01046	01045	4760
LEAD	01049	01051	87
MANGANESE	01056	01055	694
MERCURY	71890	71900	
NICKEL	01065	01067	<50
SELENIUM	01145	01147	
SILVER	01075	01077	
ZINC	01090	01092	138
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS

CHEMIST: EH 823 sms REL

REVIEWED BY:

APPROVED BY:

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	39499	GT840286 00029

SAMPLE COLLECTION INFORMATION

5. DATE RECEIVED BY LAB	17 Jul 84
6. DATE ANALYSIS COMPLETED	13 Aug, 84
7. SITE DESCRIPTION	
8. SITE LOCATION NO	
9. FLOWRATE AT SITE 00058 GAL/MIN	
10. WEATHER 00041	
11. COLLECTION DATE/PERIOD	
12. COLLECTORS NAME	
13. SAMPLING TECHNIQUE	
14. PHONE NUMBER	
15. REASON FOR SAMPLE SUBMISSION NPDES #	

ON-SITE ANALYTICAL RESULTS

16. WATER TEMP 00010 °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L

19. RESULTS OF OTHER ON-SITE ANALYSES

Sludge from separator #2

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	.
Total Organic CARBON as C	00680	.
		.

(2.7) PRESERVATION GROUP B

PARAMETER	TOTAL	MG/Gram
OIL & GREASE FREON-IR Method	(00560)	43200.
		[illegible]

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	.
NITRATE as N Cd Reduct. Method	00620	.
NITRITE as N	00615	.
TOTAL KJELDAHL NITROGEN as N	00625	.
PHOSPHORUS Ortho PO4 as P	70507	.
PHOSPHORUS as P	00665	.

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	.
CYANIDE Free, Amenable to Cl_2	00722	.

(2.1) PRESERVATION GROUP E

PARAMETER	TOTAL	µG/Gram
PHENOLS	(32730)	112.
		.

(205) PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/Gram
ARSENIC	01000	01002	.
BARIUM	01005	01007	.
CADMIUM	01025	(01027)	357.
CHROMIUM	01030	(01034)	1229.5
CHROMIUM Hexavalent		01032	<10.
COPPER	01040	(01042)	94.2
IRON	01046	(01045)	3292.
LEAD	01049	(01051)	2416.
MANGANESE	01056	(01055)	1721.
MERCURY	71890	71900	<1.0.
NICKEL	01065	(01067)	35.3
SELENIUM	01145	01147	.
SILVER	01075	01077	.
ZINC	01090	(01092)	960.
CALCIUM as Ca	00915	00916	. mg/l
MAGNESIUM as Mg	00925	00927	. mg/l
POTASSIUM	00935	00937	. mg/l
SODIUM	00930	00929	. mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	. µg/l
BORON, Dissolved	01020	. µg/l
CHLORIDE	00940	.
COLOR	00080	Units
FLUORIDE	00951	.
Residue Filterable (TDS)	00515	.
Residue Non Filt (SS)	00530	.
Residue	00500	.
Residue Volatile	00505	.
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	.
SURFACTANTS MBAS as LAS	38260	.
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS

Reviewed 11 Sept. 1984

Lindsey C. Waterhouse

LINDSEY C. WATERHOUSE, Capt, USAF, [illegible]
Chief, Bioenvironmental Engineering/[illegible]
008-36-6670
~~USAF Hospital Dover~~

CHEMIST	REL [illegible]
REVIEWED BY	
APPROVED BY	[signature]

AMD FORM MAR 83 201

NON-POTABLE WATER ANALYSIS

20 AUG 1984 12.03

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	40412-13	GN840292 00029

SAMPLE COLLECTION INFORMATION

5. SITE DESCRIPTION	6. DATE RECEIVED BY LAB	8. DATE ANALYSIS COMPLETED
	23 July 84	8 Aug. 84

ON-SITE ANALYTICAL RESULTS

7. STATION LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER	16. WATER TEMP °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L

11. COLLECTION DATE/PERIOD	12. COLLECTORS NAME	19. RESULTS OF OTHER ON-SITE ANALYSES
JUL 23 2 03 PM CM		outlet left lagoon

13. SAMPLING TECHNIQUE	14. PHONE NUMBER

15. REASON FOR SAMPLE SUBMISSION
NOTES:

ANALYSES REQUESTED AND RESULTS

12 PRESERVATION GROUP A 201

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	35.
Total Organic CARBON as C	00680	.

13 PRESERVATION GROUP B 207

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Method	00560	300.0

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	.
NITRATE as N Cd Reduct. Method	00620	.
NITRITE as N	00615	.
TOTAL KJELDAHL NITROGEN as N	00625	.
PHOSPHORUS Ortho. PO4 as P	70507	.
PHOSPHORUS as P	00665	.

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	.
CYANIDE Free, Amenable to Cl_2	00722	.

PRESERVATION GROUP E

PARAMETER	TOTAL	µG/L
PHENOLS	32730	.
		.

PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/L
ARSENIC	01000	01002	.
BARIUM	01005	01007	.
CADMIUM	01025	01027	.
CHROMIUM	01030	01034	.
CHROMIUM Hexavalent		01032	.
COPPER	01040	01042	.
IRON	01046	01045	.
LEAD	01049	01051	.
MANGANESE	01056	01055	.
MERCURY	71890	71900	.
NICKEL	01065	01067	.
SELENIUM	01145	01147	.
SILVER	01075	01077	.
ZINC	01090	01092	.
CALCIUM as Ca	00915	00916	. mg/l
MAGNESIUM as Mg	00925	00927	. mg/l
POTASSIUM	00935	00937	. mg/l
SODIUM	00930	00929	. mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	. µg/l
BORON, Dissolved	01020	. µg/l
CHLORIDE	00940	.
COLOR	00080	Units
FLUORIDE	00951	.
Residue Filterable (TDS)	00515	.
Residue Non Filt (SS)	00530	.
Residue	00500	.
Residue Volatile	00505	.
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	.
SURFACTANTS MBAS as LAS	38260	.
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

7. ORGANIZATION REQUESTING ANALYSIS
Received 11 Sept. 84
Hq AFESC/DEVP
Tyndall AFB FL 32403

CHEMIST
REL 5-3

REVIEWED BY

APPROVED BY

AMD FORM MAR 83 201 NON-POTABLE WATER ANALYSIS

20 AUG 1984 12.03

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	40414- 00028	GN840293 00029

SAMPLE COLLECTION INFORMATION	5. DATE RECEIVED BY LAB	6. DATE ANALYSIS COMPLETED
7. SITE DESCRIPTION	23 Jul 84	7 Aug. 84

8. SITE LOCATION NO	9. FLOW RATE AT SITE 00058 GAL/MIN	10. WEATHER 00041	ON-SITE ANALYTICAL RESULTS 16. WATER TEMP 00010 °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L
JUL 23 2 04 PM 84					

11. COLLECTION DATE/PERIOD	12. COLLECTORS NAME	19. RESULTS OF OTHER ON-SITE ANALYSES
		outlet of left lagoon
13. SAMPLING TECHNIQUE	14. PHONE NUMBER	
15. REASON FOR SAMPLE SUBMISSION		
NPDES #		

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A			PRESERVATION GROUP B			PRESERVATION GROUP C		
PARAMETER	TOTAL	MG/L	PARAMETER	TOTAL	MG/L	PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340		OIL & GREASE FREON-IR Method	00560		AMMONIA as N	00610	
Total Organic CARBON as C	00680					NITRATE as N Cd Reduct. Method	00620	
						NITRITE as N	00615	
						TOTAL KJELDAHL NITROGEN as N	00625	
						PHOSPHORUS Ortho PO4 as P	70507	
						PHOSPHORUS as P	00665	

PRESERVATION GROUP D			PRESERVATION GROUP E		
PARAMETER	TOTAL	MG/L	PARAMETER	TOTAL	µG/L
CYANIDE	00720		PHENOLS	32730	16200.
CYANIDE Free, Amenable to Cl_2	00722				

14

PRESERVATION GROUP F				PRESERVATION GROUP G		
PARAMETER	DISS	TOTAL	µG/L	PARAMETER	TOTAL	MG/L
ARSENIC	01000	01002		BORON	01022	µg/l
BARIUM	01005	01007		BORON, Dissolved	01020	µg/l
CADMIUM	01025	01027		CHLORIDE	00940	
CHROMIUM	01030	01034		COLOR	00080	Units
CHROMIUM Hexavalent		01032		FLUORIDE	00951	
COPPER	01040	01042		Residue Filterable (TDS)	00515	
IRON	01046	01045		Residue Non Filt (SS)	00530	
LEAD	01049	01051		Residue	00500	
MANGANESE	01056	01055		Residue Volatile	00505	
MERCURY	71890	71900		Specific Conductance	00095	µmhos
NICKEL	01065	01067		SULFATE as SO_4	00945	
SELENIUM	01145	01147		SURFACTANTS MBAS as LAS	38260	
SILVER	01075	01077		TURBIDITY	00076	Units
ZINC	01090	01092				
CALCIUM as Ca	00915	00916	mg/l			
MAGNESIUM as Mg	00925	00927	mg/l			
POTASSIUM	00935	00937	mg/l			
SODIUM	00930	00929	mg/l			

PRESERVATION GROUP J		
PARAMETER		

11. ORGANIZATION REQUESTING ANALYSIS

Received 10 Sept. 84
Klotz
Klotz AFB

CHEMIST

REVIEWED BY

APPROVED BY

Dwight D. Bird

AMD FORM MAR 83 201

NON-POTABLE WATER ANALYSIS

20 AUG 1984 12.03

2. LABORATORY PERFORMING ANALYSIS	3. LAB SAMPLE NUMBER	4. REQUESTOR SAMPLE NO
OEHL	40415	GN840294 00029

SAMPLE COLLECTION INFORMATION

7. SAMPLE DESCRIPTION	8. DATE RECEIVED AT LAB	5. DATE ANALYSIS COMPLETED
	23 JUL 84	7 Aug. 84

ON-SITE ANALYTICAL RESULTS

6. SAMPLING LOCATION NO	9. FLOW RATE AT SITE 00058 GAL/MIN	10. WEATHER	11. WATER TEMP °C	17. PH 00400 UNITS	18. DISS O_2 00300 MG/L

11. COLLECTION DATE AND TIME	12. COLLECTORS NAME	19. RESULTS OF OTHER ON-SITE ANALYSES
JUL 23 2 04 PM 84		outlet of left lagoon

13. SAMPLING TECHNIQUE	14. PHONE NUMBER

15. REASON FOR SAMPLE SUBMISSION

NOTES #

ANALYSES REQUESTED AND RESULTS

15 (216)

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

PRESERVATION GROUP B

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Method	00560	

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS ortho-P as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
PHENOLS	32730	
CYANIDE Free, Amenable to Cl_2	00722	

PRESERVATION GROUP E

PARAMETER	TOTAL	µG/L
PHENOLS	32730	

PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/L
ARSENIC	01000	01002	<10
BARIUM	01005	01007	
CADMIUM	01025	01027	35
CHROMIUM	01030	01034	347
CHROMIUM Hexavalent		01032	<50
COPPER	01040	01042	57
IRON	01046	01045	3533
LEAD	01049	01051	45
MANGANESE	01056	01055	
MERCURY	71890	71900	<1
NICKEL	01065	01067	81
SELENIUM	01145	01147	
SILVER	01075	01077	<10
ZINC	01090	01092	
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS	CHEMIST
Reviewed 11 Sept. 1984 Lindsey C. Waterhouse Dover AFB LINDSEY C. WATERHOUSE, Capt, USAF Chief, Bioenvironmental Engineering 008-36-6670 USAF Hospital Dover	EH. WH. AV
	REVIEWED BY
	APPROVED BY

AMD FORM MAR 83 201 NON-POTABLE WATER ANALYSIS

20 AUG 1984 12.03

2. LABORATORY PERFORMING ANALYSIS	LAB AND [illegible] NO.	1. REQUESTOR SAMPLE NO
JCHL	40416-17	GN840295 00029

SAMPLE COLLECTION INFORMATION

7. [illegible] DESCRIPTION	4. DATE SAMPLE COLLECTED	5. DATE ANALYSIS COMPLETED
	23 Jun 84	7 Aug 84

ON-SITE ANALYTICAL RESULTS

8. SITE LOCATION NO	9. FLOWRATE AT SITE 00058 GAL/MIN	10. WEATHER [illegible]	14. [illegible]	17. pH 00401 UNITS	18. DISS O_2 00300 MG/L

11. COLLECTION DATE/PERIOD	12. COLLECTORS NAME	16. REMARKS [illegible] ON-SITE ANALYSES
[illegible] 23 2 04 [illegible]		Drill end of left Lagoon
13. SAMPLING TECHNIQUE	14. PHONE NUMBER	

15. REASON FOR SAMPLE SUBMISSION

SPECIES n

ANALYSES REQUESTED AND RESULTS

16 PRESERVATION GROUP A (20 ml)

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	35.
Total Organic CARBON as C	00680	

17 PRESERVATION GROUP B (1 l)

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Method	00560	480.0

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Orth. PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free Amenable to Cl_2	00722	

PRESERVATION GROUP E

PARAMETER	TOTAL	µG/L
PHENOLS	32730	

PRESERVATION GROUP F

PARAMETER	DISS	TOTAL	µG/L
ARSENIC	01000	01002	
BARIUM	01005	01007	
CADMIUM	01025	01027	
CHROMIUM	01030	01034	
CHROMIUM Hexavalent		01032	
COPPER	01040	01042	
IRON	01046	01045	
LEAD	01049	01051	
MANGANESE	01056	01055	
MERCURY	71890	71900	
NICKEL	01065	01067	
SELENIUM	01145	01147	
SILVER	01075	01077	
ZINC	01090	01092	
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS

Reviewed 11 Sept 1984
Lindsey C. Waterhouse
Roque AFB

LINDSEY C. WATERHOUSE, Capt, USAF
Chief, Bioenvironmental Engineering
008-36-8670
USAF Hospital Dover

CHEMIST REL SMS dp

REVIEWED BY

APPROVED BY

AMD FORM MAR 83 201 NON-POTABLE WATER ANALYSIS

20 AUG 1984 12.03

LABORATORY PERFORMING ANALYSIS	LAB SAMPLE NO	REQUESTOR SAMPLE NO
OEHL	40418	GN840296 00029

SAMPLE COLLECTION INFORMATION

DATE: 25 July 84 — DATE ANALYSIS COMPLETED: 7 Aug 84

JUL 23 2 04 PM '84

ONSITE ANALYTICAL RESULTS

	pH UNITS	18. DISS O2 00300 MG/L

REMARKS / NONSITE ANALYSES: Outfall left lagoon.

ANALYSES REQUESTED AND RESULTS

PRESERVATION GROUP A PARAMETER	TOTAL	MG/L
[illegible] OXYGEN	00340	•
[illegible]	00680	•
		•

PRESERVATION GROUP B PARAMETER	TOTAL	MG/L
[illegible]	[illegible]	•

PRESERVATION GROUP C PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	•
NITRATE as N	00620	•
NITRITE as N	00615	•
TOTAL KJELDAHL NITROGEN as N	00625	•
[illegible]	[illegible]	•
[illegible]	[illegible]	•

PRESERVATION GROUP D PARAMETER	TOTAL	MG/L
[illegible]	00720	•
CYANIDE [illegible]	00722	•

18

PRESERVATION GROUP E PARAMETER	TOTAL	MG/L
[illegible]	[illegible]	17600 •
		•

(circled: 2W)

PRESERVATION GROUP F PARAMETER	DISS	TOTAL	µG/L
ARSENIC	[illegible]	[illegible]	•
BARIUM	[illegible]	1007	•
CADMIUM	01025	01027	•
CHROMIUM	[illegible]	[illegible]	•
CHROMIUM HEXAVALENT		[illegible]	•
COPPER	01040	01042	•
IRON	01046	01045	•
LEAD	01049	01051	•
MANGANESE	01056	01055	•
MERCURY	71890	71900	•
NICKEL	01065	01067	•
SELENIUM	01145	01147	•
SILVER	01075	01077	•
ZINC	01090	[illegible]	•
CALCIUM as Ca	00915	00916	• mg/l
MAGNESIUM as Mg	00925	00927	• mg/l
POTASSIUM	00935	00937	• mg/l
SODIUM	00930	00929	• mg/l

PRESERVATION GROUP G PARAMETER	TOTAL	MG/L
BORON	01022	• µg/l
BORON, Dissolved	01020	• µg/l
CHLORIDE	00940	•
COLOR	00080	Units
FLUORIDE	00951	•
Residue Filterable (TDS)	00515	•
Residue Non Filt (SS)	00530	•
Residue	00500	•
Residue Volatile	00505	•
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	•
SURFACTANTS MBAS as LAS	38260	•
TURBIDITY	00076	Units

PRESERVATION GROUP J PARAMETER		

STANDARD [illegible]

Received 11 Sept. 1984

Dover AFB

LINDSEY C. WATERHOUSE,
Chief, Bioenvironmental Engineering
003-36-6070
USAF Hospital Dover

EMSC [signature]

REVIEWED BY [signature]

APPROVED BY [signature]

AMD FORM MAR 83 201 — NON-POTABLE WATER ANALYSIS

20 [illegible] 1984 12.03

2. LABORATORY PERFORMING ANALYSIS	3. LAB AND NO.	4. REQUESTOR SAMPLE NO
CEHL	40419	GN840297

SAMPLE COLLECTION INFORMATION

5. SITE DESCRIPTION	6. DATE SAMPLED	7. DATE ANALYSIS COMPLETED
	23 Jul 84	7 Aug 84

8. SITE LOCATION NO	9. FLOWRATE AT SITE 00056 GAL/MIN	10. WEATHER	**ON-SITE ANALYTICAL RESULTS** 11. TEMP	12. PH 00400 UNITS	13. DISS O_2 00300 MG/L

11. COLLECTION DATE/PERIOD	12. COLLECTORS NAME	15. REMARKS FOR OTHER ON-SITE ANALYSES
Jul 23 2 04 PM to		added to left Lagoon

13. SAMPLING TECHNIQUE	14. PHONE NUMBER

15. REASON FOR SAMPLE SUBMISSION

NPDES #

ANALYSES REQUESTED AND RESULTS

19

PRESERVATION GROUP A

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	
Total Organic CARBON as C	00680	

PRESERVATION GROUP B

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Method	00560	

PRESERVATION GROUP C

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	
NITRATE as N Cd Reduct. Method	00620	
NITRITE as N	00615	
TOTAL KJELDAHL NITROGEN as N	00625	
PHOSPHORUS Orth. PO4 as P	70507	
PHOSPHORUS as P	00665	

PRESERVATION GROUP D

PARAMETER	TOTAL	MG/L
CYANIDE	00720	
CYANIDE Free Amenable to Cl_2	00722	

PRESERVATION GROUP E

PARAMETER	TOTAL	µG/L
PHENOLS	32730	

PRESERVATION GROUP F (216)

PARAMETER	DISS	TOTAL	µG/L
ARSENIC	01000	01002	L 10
BARIUM	01005	01007	
CADMIUM	01025	01027	57
CHROMIUM	01030	01034	688
CHROMIUM Hexavalent		01032	L 50
COPPER	01040	01042	42
IRON	01046	01045	3461
LEAD	01049	01051	190
MANGANESE	01056	01055	
MERCURY	71890	71900	L 1
NICKEL	01065	01067	L 50
SELENIUM	01145	01147	
SILVER	01075	01077	L 10
ZINC	01090	01092	
CALCIUM as Ca	00915	00916	mg/l
MAGNESIUM as Mg	00925	00927	mg/l
POTASSIUM	00935	00937	mg/l
SODIUM	00930	00929	mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	µg/l
BORON, Dissolved	01020	µg/l
CHLORIDE	00940	
COLOR	00080	Units
FLUORIDE	00951	
Residue Filterable (TDS)	00515	
Residue Non Filt (SS)	00530	
Residue	00500	
Residue Volatile	00505	
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	
SURFACTANTS MBAS as LAS	38260	
TURBIDITY	00076	

PRESERVATION GROUP J

PARAMETER		

1. ORGANIZATION REQUESTING ANALYSIS

Received 11 Sept 1984

Ltr dtd 7 Sept 1984 from Lindsey C. Waterhouse

LINDSEY C. WATERHOUSE, Capt, USAF,
Chief, Environmental Engineering
DOD-36-0[illegible]
USAF Hospital Dover

CHEMIST [illegible]

REVIEWED BY

APPROVED BY [illegible]

AMD FORM MAR 83 201

NON-POTABLE WATER ANALYSIS

2 ... 1984 12.03

2. LABORATORY PERFORMING ANA...	...	... REQUESTOR SAMPLE NO
OEHL	40420-23	CT 840298 00029

SAMPLE COLLECTION INFORMATION

SITE DESCRIPTION				DATE ANALYSIS COMPLETED
			23 Jul 84	7 Aug 84

ON-SITE ANALYTICAL RESULTS

8. SITE LOCATION NO	9. FLOW RATE AT SITE GAL/MIN	...	...	UNITS 00400	18. DISS O_2 00300 MG/L

11. COLLECTION DATE ...	... COLLECTORS NAME
13. SAMPLING TECHNIQUE JUL 23 2 04 PM '84	14. PHONE NUMBER

... OTHER ON-SITE ANALYSES: outlet to left lagoon ... recharge ...

15. REASON FOR SAMPLE SUBMISSION

NOTES #

ANALYSES REQUESTED AND RESULTS

20 PRESERVATION GROUP A (207)

PARAMETER	TOTAL	MG/L
Chemical Oxygen Demand	00340	15 .
Total Organic CARBON as C	00680	.

21 PRESERVATION GROUP ... (207)

PARAMETER	TOTAL	MG/L
OIL & GREASE FREON-IR Meth	00560	300.0
		50 ...

PRESERVATION GROUP ...

PARAMETER	TOTAL	MG/L
AMMONIA as N	00610	.
NITRATE as N Cd Reduct. Method	00620	.
NITRITE as N	00615	.
TOTAL KJELDAHL NITROGEN as N	00625	.
PHOSPHORUS Ortho PO4 as P	70507	.
PHOSPHORUS as P	00665	.

PRESERVATION GROUP ...

PARAMETER	TOTAL	MG/L
CYANIDE	00720	.
CYANIDE ... Amenable ...	00722	.

22 PRESERVATION GROUP E (264)

PARAMETER	TOTAL	µG/L
PHENOLS	32730	17200 .
		4... .

23 PRESERVATION GROUP F (216)

PARAMETER	...	TOTAL	µG/L
ARSENIC	01000	01002	<10 .
BARIUM	01005	01007	.
CADMIUM	01025	01027	45 .
CHROMIUM	01030	01034	107 .
CHROMIUM Hexavalent		01032	<50 .
COPPER	01040	01042	56 .
IRON	01046	01045	3607 .
LEAD	01049	01051	<20 .
MANGANESE	01056	01055	.
MERCURY	71890	71900	<1 .
NICKEL	01065	01067	<50 .
SELENIUM	01145	01147	.
SILVER	01075	01077	<10 .
ZINC	01090	01092	.
CALCIUM as Ca	00915	00916	. mg/l
MAGNESIUM as Mg	00925	00927	. mg/l
POTASSIUM	00935	00937	. mg/l
SODIUM	00930	00929	. mg/l

PRESERVATION GROUP G

PARAMETER	TOTAL	MG/L
BORON	01022	. µg/l
BORON, Dissolved	01020	. µg/l
CHLORIDE	00940	.
COLOR	00080	Units
FLUORIDE	00951	.
Residue Filterable (TDS)	00515	.
Residue Non Filt (SS)	00530	.
Residue	00500	.
Residue Volatile	00505	.
Specific Conductance	00095	µmhos
SULFATE as SO_4	00945	.
SURFACTANTS MBAS as LAS	38260	.
TURBIDITY	00076	Units

PRESERVATION GROUP J

PARAMETER		

... ORGANIZATION REQUESTING ANALYSIS

Received ... Sept 1984

Dover AFB

LINDSEY C. ... Capt, USAF, ...
Chief, Bio...
008-36-6670
USAF Hospital Dover

CHEMIST: EH ... RELS ...

REVIEWED BY

APPROVED BY

AMD FORM MAR 83 201 NON-POTABLE WATER ANALYSIS

APPENDIX I: Correspondance With Regulatory Authorities

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF ENVIRONMENTAL CONTROL
WATER RESOURCES SECTION
89 KINGS HIGHWAY
P.O. BOX 1401
DOVER, DELAWARE 19903

TELEPHONE (302) 736-4761

February 28, 1984

Mr. Thomas D. Sims, Chief
Environmental Planning Division
Department of the Air Force
526 Title Building
30 Pryor Street, S.W.
Atlanta, Georgia 30303

Dear Mr. Sims:

The Delaware Department of Natural Resources and Environmental Control (DNREC) has reviewed the Installation Restoration Program Phase I, Records Search Report for Dover Air Force Base, Delaware. Based on the recommendations proposed by Engineering Science, we offer the following comments for your consideration.

Hydrogeologic work must be performed under the supervision of a geologist registered in Delaware. Hydrogeologic reports must bear the signature and seal of a registered geologist.

Monitoring wells must have approval in the form of permits from the Department prior to construction. Wells must be installed by water well contractors licensed by the Department, confirm with Department regulations (including any special guidelines or conditions), and be designed for compatibility with determination of hydrogeologic conditions (aquifer characteristics and ground water flow patterns). Guidelines for water table monitor wells are attached.

Geophysical investigations (electrical resistivity and magnetometer surveys) may be useful, especially the former in defining characteristics and thickness of the Columbia sediments. However, these methods are unlikely to be of use in delineating contaminant plumes which do not have electrical properties significantly different from that of the natural ground water. Therefore, use of these geophysical methods to determine whether additional work is needed is not advisable.

Monitor wells should be located downgradient of each major source of contamination. Test borings at each site should be extended to the base of the Columbia Formation to determine the presence and thickness of the confining bed above the Frederica Aquifer.

At least one upgradient well and three downgradient wells should be installed at the IW-basin site. In addition, we request at least quarterly sampling of wells

for parameters presented in Table 6.2(b). Performance of a complete hydrogeologic study of the site, as required by 40 CFR 264.91(c), is requested. If remedial action is warranted, a corrective action program which includes, but is not limited to, requirements listed in 40 CFR 264.100 should be developed.

Assessment of the need for future investigations and any remedial work should depend on the potential impact upon current and/or future sources of water supply and on the existing potential of adverse impacts on the environment. A meeting with Dover Air Force Base representatives, consultants, and DNREC to discuss these comments, particularly the consultants' reaction and proposed investigative approach is recommended.

Questions related to RCRA concerns may be directed to Ms. Eileen Hack (302-736-3685); CERCLA questions to Mr. Robert Pickert (302-736-5063).

Sincerely,

William Razor

William G. Razor
Supervisor/Environmental Engineer
Solid Waste Management Branch

Michael A. Apgar, P.G.
Supervisor
Water Supply Branch

WGR:MAA:lmw
Attachment
cc: Alan H. Simpson
Eileen M. Hack
Robert C. Pickert

AND ENVIRONMENTAL CONTR

DIVISION OF ENVIRONMENTAL CONTROL

WATER SUPPLY BRANCH

GENERAL GUIDELINES FOR CONSTRUCTION OF MONITOR WELLS

1. Monitor wells must be constructed by a method which will define the characteristics of the geologic materials under the site. The properties of the earth materials penetrated by the wells must be described.

2. Monitor wells close to the waste sources, unless otherwise approved by DNREC based on the ground-water flow system, are to be screened from the seasonal high water table level to five feet below the seasonal low water level.

3. The screen slots must be small enough to allow turbidity - free water to be withdrawn from the well, and should be machine slotted or manufactured screens rather than pipe with hack sawed slots. Each well must be developed after construction so that the well will yield at least 1 gallon of turbidity - free water per minute.

4. The annular space of the screened interval must be gravel packed.

5. If the water level will never be deeper than 15 feet below the ground surface, a 2-inch I.D. casing can be used with a centrifugal pump. If the water level may at times be 15 feet below the ground surface, the casing must be at least 4 inches in diameter to accomodate a submersible pump.

6. Either PVC or steel casing is acceptable as long as at least schedule 40 pipe is utilized.

7. The annular space around each casing must be sealed with cement or bentonite from the ground surface to 2 feet above the screen to prevent vertical leakage along the well casing.

8. The casing should be protected from entry of contaminants, vandalism, or accidental damage by machinery by constructing the cap above grade and, if PVC casing is used, using a protective concentric steel casing around the above-ground portion with a locking top.

9. The elevations of the tops of the well casings, without the caps, must be measured to determine the direction of groundwater flow.

10. Permits to construct the monitoring wells must be obtained from the Water Supply Branch of the DNREC, prior to construction.

7/80

11. Well must be drilled by a licensend Well Contractor.

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF ENVIRONMENTAL CONTROL
WATER RESOURCES SECTION
89 KINGS HIGHWAY
P.O. BOX 1401
DOVER, DELAWARE 19903

TELEPHONE (302) 736 - 4761

MEMORANDUM

TO: Mr. Kevin Burdette

FROM: Philip J. Cherry

DATE: October 22, 1984

The Department herein waives the policy requirement requiring gravel packing of monitor wells for the following wells located on Dover Air Force property. The wells are designated (DNREC permit #'s #58895, #58918 thru #58931, and 1 ~~through #17~~ #58934 thru #58945). Said wells must still meet all other requirements as set forth in "General Guidelines for Construction of Monitor Wells" (copy attached).

PJC/

DELAWARE DEPARTMENT OF NATURAL RESOURCES

AND ENVIRONMENTAL CONTROL

DIVISION OF ENVIRONMENTAL CONTROL

WATER SUPPLY BRANCH

GENERAL GUIDELINES FOR CONSTRUCTION OF MONITOR WELLS

1. Monitor well must be constructed by a method which will define the characteristics of the geologic materials under the site. The properties of the earth materials penetrated by the wells must be described.

2. Monitor wells close to the waste sources, unless otherwise approved by DNREC based on the ground-water flow system, are to be screened from the seasonal high water table level to five feet below the seasonal low water level.

3. The screen slots must be small enough to allow turbidity - free water to be withdrawn from the well, and should be machine slotted or manufactured screens rather than pipe with hack sawed slots. Each well must be developed after construction so that the well will yield at least 1 gallon of turbidity - free water per minute.

4. The annular space of the screened interval must be gravel packed.

5. . the water level will never be deeper than 15 feet below the ground surface, a 2-inch I.D. casing can be used with a centrifugal pump. If the water level may at times be 15 feet below the ground surface, the casing must be at least 4 inches in diameter to accommodate a submersible pump.

6. Either PVC or steel casing is acceptable as long as at least schedule 40 pipe is utilized.

7. The annular space around each casing must be sealed with cement or bentonite from the ground surface to 2 feet above the screen to prevent vertical leakage along the well casing.

8. The casing should be protected from entry of contaminants, vandalism, or accidental damage by machinery by constructing the cap above grade and, if PVC casing is used, using a protective concentric steel casing around the above-ground portion with a locking top.

9. The elevations of the tops of the well casings, without the caps, must be measured to determine the direction of groundwater flow.

10. Permits to construct the monitoring wells must be obtained from the Water Supply Branch of the DNREC, prior to construction.

/80

APPENDIX J: Dover Air Force Base
Waste Management Summary Tables

Table J-1

Summary of Waste Material and Time Period of No Known Method of Disposal

(From IRP Phase IIa report, JRB, June 1984)

Shop Name	Waste and Quantity	Period of Unknown Method	Earliest Known Method of Disposal
436 AMS[1] Electric Shop	PD-680; 10 gals/mo. batteries (acid); 15 batt./mo.	1942-1955	1955-1965. fire training/landfill
436 AMS Battery Shop	batteries (acid); 100 batt./mo	1942-1955	1955-1984, neutralized
436 CES[2] Paint Shop	paints, MEK[3]. toluene, thinner minneral spirits; 25 gals/mo.	1942-1951	1951-1984, drums-contractor
436 FMS[4] - Aero Ground Equipment Branch	waste lube oil; 110 gals/mo.	1942-1951	1951-1975, fire training
	hydraulic fluid; 23 gals/mo	1942-1951	1951-1965, landfill/fire training
	synthetic oil; 8 gals/mo	1942-1951	1951-1975, fire training
	mixed wastes (PD-680, waste oils, hydraulic fluid); 41 gals/mo	1942-1951	1951-1965, fire training
436 FMS Shop	hydraulic fluid; 165 gals/mo (pro-tem 1100 gals/mo.)	1942-1946	1951-1965, fire training
436 FMS Wheel and Tire Shop	PD-680; 110 gals/mo	1942-1946	1951-1965, fire training
436 FMS Aero Repair	PD-680; 18 gals/mo hydraulic fluid; 18 gals/mo	1942-1946	1951-1965, fire training
436 FMS Metal Plating and Welding	trichloroethane; 27 gals/yr acids; 50 gals/yr, cadmium cyanide crystals, 55 gals/2 yrs.	1942-1946	1951-1963, North Ditch

(1) AMS - Avionics Maintenance Squadron
(2) CES - Civil Engineering Squadron
(3) MEK - Methyl Ethyl Ketone
(4) FMS - Field Maintenance Squadron

Table J-1

Summary of Waste Material and Time Period of No Known Method of Disposal
(Continued)

Shop Name	Waste and Quantity	Period of Unknown Method	Earliest Known Method of Disposal
436 FMS Jet Engine Inspection/Maintenance Shops	PD-680; 75 gals.mo.	1942-1946	1951-1963, North Ditch
	hydraulic fluid; 30 gals/mo.		
	hot carbon remover; 220 gals/m		
	cold carbon remover; 10 gals/mo		
	alkaline descaler; 135 gals/mo.		
	lacquer paint remover; 220 gals/mo.		
	epoxy paint remover; 340 gals/mo.	1942-1946	1951-1963, North Ditch
	trichloroethane; 73 gals/mo.		
	wheel stripper; 80 gals/mo.		
	acetone; 4 gals/mo.		
	calibrating fluid; 10 gals/mo.		
	synthetic oil, trichloroethane,		
	PD-680; 110 gals/mo.	1942-1946	1951-1963, North Ditch
	JP-4; 27 gals/mo.	1942-1946	1951-1984, fire training
436 TS^2 Vehicle Maintenance	waste oil; 110 gals/mo.	1942-1946	1951-1975, fire training
	battery acid; 60 gals/mo.	1942-1946	1951-1984, neutralized
	waste oil, hydraulic fluid; 30 gals/mo.	1942-1946	1951-1963, landfill/ fire training

Table J-2
(From IRP Phase I report, ES, October 1983)

INDUSTRIAL OPERATIONS (Shops)

Waste Management

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL (1950 1960 1970 1980)
436th AIR BASE GROUP (ABG)				
AUTO HOBBY SHOP	124	WASTE OIL	320 GAL./MO.	DPDO 1967 1969 UNDERGROUND TANK/CONTRACTOR
		WASTE LACQUER SOLVENT	15 GAL./MO.	1967 CONTRACTOR
PHOTOGRAPHY HOBBY SHOP	124	SPENT PHOTO FIXER	5 GAL./6 MOS.	SILVER RECOVERY AT BASE PHOTO LAB 1982
436th AVIONICS MAINTENANCE SQUADRON (AMS)				
AMS ELECTRIC SHOP	722	PD 680	10 GAL./MO.	1962 1946 1951 BOWSER/LANDFILL OR FIRE TRAINING BOWSER/BASIN TANK DRUM/DPDO
		BATTERIES (ACID)	15 BATT./MO.	1962 1946 1951 NEUTRALIZED INTO DRY SINK/STORM DRAIN
AMS BATTERY SHOP	711	BATTERIES (ACID)	100 BATT./MO.	1962 1946 1951 NEUTRALIZED /SANITARY SEWER
436th CIVIL ENGINEERING SQUADRON				
ROADS AND GROUNDS	914	DEGREASER (SD 5)	ESTIMATE UNAVAILABLE	WASH RACK OIL/WATER SEPARATOR INDUSTRIAL WASTE COLLECTION SYSTEM BLDG. 502 1951 NORTH DITCH
ENTOMOLOGY	921	PESTICIDE DRUMS	ESTIMATE UNAVAILABLE	1951 ON BASE LANDFILLS TRIPLE RINSED /DPDO
	601, 914	EMPTY PESTICIDE CONTAINER (SMALL)	10 20/MO.	1951 ON BASE LANDFILLS RINSED/DUMPSTER

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - ESTIMATED TIME FRAME DATA BY SHOP PERSONNEL

Table J-2

INDUSTRIAL OPERATIONS (Shops)

Waste Management

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL (1950 1960 1970 1980)
436th CIVIL ENGINEERING SQUADRON (cont'd)				
PAINT SHOP	615	PAINTS, MEK, TOLUENE, THINNER, MINERAL SPIRITS	25 GALS./MO.	1942–1946; 1951 DRUMS/CONTRACTOR
		EMPTY PAINT DRUMS	50/YR.	1951 LANDFILL DPDO
		EMPTY PAINT CANS	50/3 MOS.	OFF BASE LANDFILL DPDO
REFRIGERATION SHOP	602	LUBE OIL	27 GALS./MO.	1951 FIRE TRAINING DRUMS/DPDO
LIQUID FUELS	602	WASTE FUEL	600 GALS./YR.	1951 FIRE TRAINING DPDO OR FIRE TRAINING
		TANK CLEANING SLUDGE	30 GALS./YR.	1951 WEATHERED IN BERMED AREAS
POWER PRODUCTION	615	BATTERIES (ACID)	120 BATT./MO.	1951 NEUTRALIZED/SANITARY SEWER; NEUTRALIZED/INDUSTRIAL WASTE COLLECTION SYSTEM
		ETHYLENE GLYCOL	50 GALS./MO.	1951 DILUTED/SANITARY SEWER; DILUTED/INDUSTRIAL WASTE COLLECTION SYSTEM
		WASTE OIL	110 GALS./MO.	1951 FIRE TRAINING DRUMS/DPDO
436th FIELD MAINTENANCE SQUADRON				
EMS, AERO GROUND EQUIPMENT BRANCH	778, 779	WASTE LUBE OIL	110 GALS./MO.	1942–1946; 1951 FIRE TRAINING DRUMS/DPDO
		HYDRAULIC FLUID	83 GALS./MO.	1942–1946; 1951 BOWSER/LANDFILL OR FIRE TRAINING; BOWSER/BASIN TANK DRUMS DPDO
		SYNTHETIC OIL	8 GALS./MO.	1942–1946; 1951 FIRE TRAINING DRUMS/DPDO
		MIXED WASTES (PD 680, WASTE OILS, HYDRAULIC FLUID)	41 GALS./MO.	1942–1946; BOWSER/FIRE TRAINING; BOWSER/BASIN TANK DRUMS/DPDO

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

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Table J-2

INDUSTRIAL OPERATIONS (Shops)

Waste Management

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL
				1950 1960 1970 1980
436th FIELD MAINTENANCE SQUADRON (cont'd)				
AIRCRAFT ENVIRONMENTAL SYSTEMS	714	WASTE OIL	2 QTS./WK.	1951 FIRE TRAINING → DRUMS/DPDO
		TRICHLOROETHYLENE, PD-680	ESTIMATE UNAVAILABLE	1951 LANDFILL OR FIRE TRAINING → BASIN TANK
PNEUDRAULICS SHOP	712	HYDRAULIC FLUID	165 GALS./MO. (PRO TEM 1100 GALS./MO.)	
		PD 680	18 GALS./MO.	
WHEEL AND TIRE SHOP	712	PD 680	110 GALS./MO.	1982 1986 1951 LANDFILL OR FIRE TRAINING → BASIN TANK → DRUMS DPDO
AERO REPAIR	714	PD 680	18 GALS./MO.	
		HYDRAULIC FLUID	18 GALS./MO.	
FUEL SYSTEMS REPAIR	995, 715, FLIGHTLINE	JP 4	630 GALS./MO.	1951 FIRE TRAINING → BOWSER UNDERGROUND TANK AT "B" ROW
NON DESTRUCTIVE INSPECTION	714	SPENT PHOTO FIXER	85 GALS./MO.	SILVER RECOVERY TO SANITARY SEWER 1951 SANITARY SEWER
		ISOPAR	5 GALS./MO.	1951 LANDFILL OR FIRE TRAINING → DRUMS LAGOON TANK
MACHINE SHOP	724	WASTE OILS	15 GALS./YR.	1951 DRUMS DPDO OR FIRE TRAINING → DRUMS DPDO
METAL PLATING AND WELDING	724	TRICHLOROETHANE	22 GALS./YR.	1982 1986 1951 NORTH DITCH → INDUSTRIAL WASTE COLLECTION SYSTEM
		ACIDS	50 GALS./YR.	1982 1986 1951 NORTH DITCH → NEUTRALIZED WITH SPENT ELECTROCLEANER → INDUSTRIAL WASTE COLLECTION SYSTEM
		CADMIUM CYANIDE CRYSTALS	55 GALS./2 YRS.	1982 1986 1951 NORTH DITCH → DRUMMED/CONTRACTOR

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

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Table J-2

INDUSTRIAL OPERATIONS (Shops)

Waste Manageme..t

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL (1950 1960 1970 1980)
436th FIELD MAINTENANCE SQUADRON (cont'd)				
CORROSION CONTROL		WASTE PAINT THINNERS (POLYURETHANE THINNER, TOLUENE, MEK, LACQUER THINNER)	600 GALS./MO.	1942–1946; 1951 LANDFILL OR FIRE TRAINING; BOWSER CORROSION CONTROL WASH RACK; DRUMS (DPDO)
		TRICHLOROETHYLENE		1942–1946; 1951 FIRE TRAINING; BASIN TANK
		WASTE PAINT	30 GALS./MO	1942–1946; 1951 LANDFILL OR FIRE TRAINING; BOWSER CORROSION CONTROL WASH RACK; DRUMS DPDO
CORROSION CONTROL WASH RACK	582	PAINT STRIPPER	12 GALS./DAY	1951 NORTH DITCH; OIL WATER SEPARATOR; INDUSTRIAL WASTE COLLECTION SYSTEM
		MEK	20 GALS./DAY	
		SODIUM HYDROXIDE	25 GALS./MO.	
JET ENGINE TEST CELL	613	WASTE OIL, JP 4, SOAP, HYDRAULIC FLUID		1951 OIL WATER SEPARATOR
JET ENGINE INSPECTION, MAINTENANCE SHOPS	725, 719	PD 680	75 GALS./MO.	1942–1946; 1951 NORTH DITCH; INDUSTRIAL WASTE COLLECTION SYSTEM; DRUMS DPDO
		HYDRAULIC FLUID	30 GALS./MO.	
		HOT CARBON REMOVER	220 GALS./MO.	
		COLD CARBON REMOVER	10 GALS./MO.	
		ALKALINE DESCALER	135 GALS./MO.	1942–1946; 1951 NORTH DITCH; INDUSTRIAL WASTE COLLECTION SYSTEM
		LACQUER PAINT REMOVER	220 GALS./MO.	
		EPOXY PAINT REMOVER	340 GALS./MO.	

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

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Table J-2

INDUSTRIAL OPERATIONS (Shops)

Waste Management

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL (1950 1960 1970 1980)
436th FIELD MAINTENANCE SQUADRON (cont'd)				
JET ENGINE INSPECTION/ MAINTENANCE SHOPS (cont'd)	725, 719	TRICHLOROETHANE (TCA)	73 GALS./MO.	1962 1966 1981 NORTH DITCH INDUSTRIAL WASTE COLLECTION SYSTEM CONTRACTOR
		WHEEL STRIPPER	80 GALS./MO.	1962 1966 1981 NORTH DITCH INDUSTRIAL WASTE COLLECTION SYSTEM
		ACETONE	4 GALS./MO	
		CALIBRATING FLUID	10 GALS./MO.	1962 1966 1981 NORTH DITCH INDUSTRIAL WASTE COLLECTION SYSTEM DRUMS/GUARD BASINS
		JP 4	27 GALS./MO.	1962 1966 1981 FIRE TRAINING
		SYNTHETIC OIL, TCA, PD-680	110 GALS./MO.	1962 1966 1981 NORTH DITCH INDUSTRIAL WASTE COLLECTION SYSTEM DRUMS/DPDO
DENTAL CLINIC AND LAB	304	SPENT PHOTO FIXER	5 GALS./MO.	1981 SILVER RECOVERY TO SANITARY SEWER
MEDICAL X RAY	300	SPENT PHOTO FIXER	160 GALS./MO.	
FLIGHTLINE BRANCH	704	WASTE OIL	27 GALS./MO.	1981 FIRE TRAINING DPDO
		HYDRAULIC FLUID	2400 GALS./MO.	19[illegible] LANDFILL OR FIRE TRAINING BASIN TANK DRUMS/DPDO
TRANSIENT MAINTENANCE	576	JP 4	10 GALS./MO.	1981 DRUM/FIRE TRAINING

KEY

———CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - -ESTIMATED TIME FRAME DATA BY SHOP PERSONNEL

Table J-2
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INDUSTRIAL OPERATIONS (Shops)

Waste Management

SHOP NAME	LOCATION (BLDG. NO.)	WASTE MATERIAL	WASTE QUANTITY	METHOD(S) OF TREATMENT, STORAGE & DISPOSAL 1950 1960 1970 1980
436th TRANSPORTATION SQUADRON				
VEHICLE MAINTENANCE COMPOSITE OF SHOPS	635, 780, 781	WASTE OIL	110 GALS./MO.	1942–1946; 1951 FIRE TRAINING → DRUMS/DPDO
		BATTERY ACID	60 GALS./MO.	1942–1946; NEUTRALIZED TO SANITARY SEWER
		WASTE OIL, HYDRAULIC FLUID	30 GALS./MO.	1942–1946; LANDFILL OR FIRE TRAINING → BOWSER/BASIN TANK
REFUELING, VEHICLE MAINTENANCE	636	WASTE OIL	25 GALS./MO.	
		JP 4	50 GALS./MO.	
		PD 680	9 GALS./MO.	1942–1946; FIRE TRAINING → INDUSTRIAL WASTE COLLECTION SYSTEM
		DIESEL FUEL	< 2 GALS./MO.	
		MOGAS	< 2 GALS./MO.	

KEY

———— CONFIRMED TIME FRAME DATA BY SHOP PERSONNEL

- - - - - - ESTIMATED TIME FRAME DATA BY SHOP PERSONNEL

APPENDIX K: CALCULATIONS

SAIC

Worksheet

Subject: Hydrogeologic Calculations
Site T-1, IW Basins

Page | Date

Client: Dover AFB, Phase II Stage 1
Project No.

Prepared By | Checked By

Hydraulic conductivity (K) = 90 ft/day
Effective porosity (n) = 0.20
Hydraulic gradient (i) = 0.0016
Distance to Base Boundary (d) = 1300 ft

1. Calculation of Groundwater Flow Velocity

$$\text{Velocity } (v) = Ki/n$$

$$v = \frac{(90\ ft/day)(0.0016)}{(0.20)}$$

$$v = 0.72\ ft/day$$

2. Calculation of Travel Time to Base Boundary

$$\text{Travel time} = d/v$$

$$= \frac{1300\ ft}{0.72\ ft/day}$$

$$= 1805 \text{ days } (4.9 \text{ years})$$

SAIC

Worksheet

Subject: Hydrogeologic Calculations

Page: _____ Date: _____

Client: Dover AFB, Phase II Stage 1

Project No.: _____

Prepared By: _____

Checked By: _____

Sites D-10 and FT-1

Hydraulic conductivity (K) = 90 ft/day
Effective porosity (n) = 0.20
Hydraulic gradient (i) = 0.0024
Distance to Base Boundary (d) = 4099.7 ft

1. Calculation of Groundwater Flow Velocity

$$\text{Velocity } (v) = Ki/n$$

$$v = \frac{(90\ ft/day)(0.0024)}{0.20}$$

$$v = 1.08\ ft/day$$

2. Calculation of Travel Time to Base Boundary

$$\text{Travel Time} = d/v$$

$$\text{Travel time} = \frac{4099.7\ ft}{1.08\ ft/day}$$

$$\text{travel time} = 3796\ \text{days}\ (10.4\ \text{yrs.})$$

SAIC

Worksheet
Hydrogeologic Calculations

Page _____ Date _____

Subject: Site FT-3

Client: Dover AFB, Phase II Stage 1

Project No. _____

Prepared By _____

Checked By _____

Hydraulic Conductivity (K) = 90 ft/day
Effective porosity (n) = 0.20
Hydraulic gradient (i) = 0.0014
Distance to Base Boundary (d) = 1402.7 ft

1. Calculation of Groundwater Flow Velocity

$$\text{Velocity } (v) = Ki/n$$

$$v = \frac{(90\ ft/day)(0.0014)}{0.20}$$

$$v = 0.63\ ft/day$$

2. Calculation of Travel Time to Base Boundary

$$\text{Travel Time} = d/v$$

$$\text{Travel time} = \frac{1402.7\ ft}{0.63\ ft/day}$$

$$\text{Travel time} = 2226.5\ \text{days}\ (6.1\ \text{years})$$

SAIC

Worksheet

Subject: Hydrogeologic Calculations — Page — Date

Client: Dover AFB, Phase II, Stage 1

Site S-1 — Project No.

Prepared By — Checked By

Hydraulic conductivity (K) = 90 ft/day
Effective porosity (n) = 0.20
Hydraulic gradient (i) = 0.0009
Distance to Base Boundary (d) = 2813.4 ft

1. Calculation of Groundwater Flow Velocity

Velocity (v) = Ki/n

$$v = \frac{(90\ ft/day)(0.0009)}{0.20}$$

$$v = 0.41\ ft/day$$

2. Calculation of Travel Time to Base Boundary

Travel Time = d/v

$$\text{Travel time} = \frac{2813.4\ ft}{0.41\ ft/day}$$

Travel time = 6862 days (18.8 years)

SAIC

Worksheet
Hydrogeologic Calculations

Page _____ Date _____

Subject: Site XYZ

Client: Dover AFB, Phase II, Stage 1

Project No. 1

Prepared By _____

Checked By _____

Hydraulic Conductivity (K) = 90 ft/day
Effective Porosity (n) = 0.20
Hydraulic gradient (i) = 0.0045
Distance to Base Boundary (d) = 2623.8 ft

1. Calculation of Groundwater Flow Velocity

Velocity (v) = Ki/n

$$v = \frac{(90 \text{ ft/day})(0.0045)}{0.20}$$

$$v = 2.025 \text{ ft/day}$$

2. Calculation of Travel Time to Base Boundary

Travel Time = d/v

$$\text{Travel time} = \frac{2623.8 \text{ ft}}{2.025 \text{ ft/day}}$$

Travel time = 1296 days (3.55 years)

APPENDIX L: Resumes

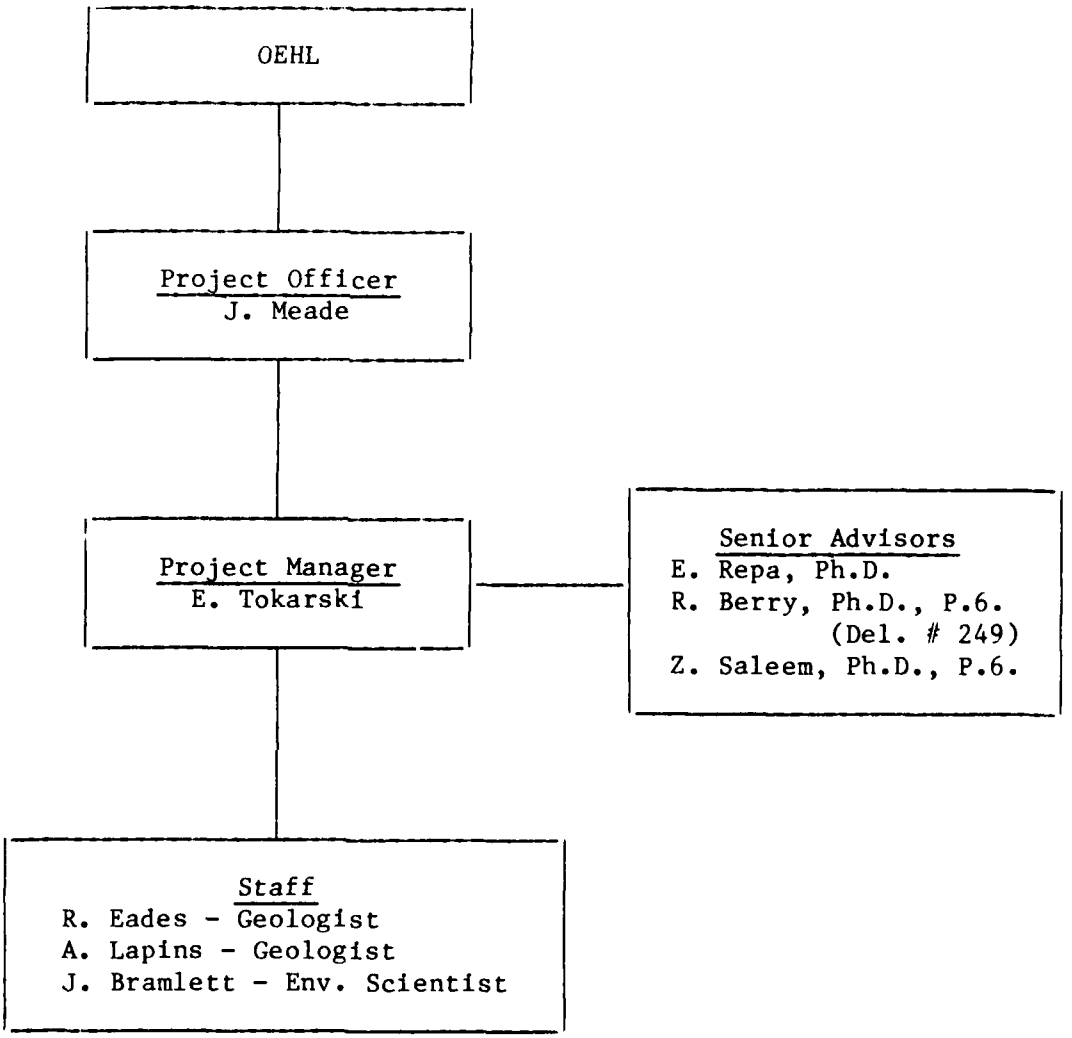

Figure K-1

Project Management Structure - Dover AFB Phase II Stage 1 Study

JENNIFER A. BRAMLETT

EDUCATION

University of Maryland: B.S., Natural Resource Management (1979)

EXPERIENCE

Ms. Bramlett is an environmental scientist with over five years of experience in the field of solid and hazardous waste management. She has worked within waste regulatory programs under both RCRA and CERCLA, for both the U.S. EPA and the Department of Defense (DOD) and for state and local governments.

Ms. Bramlett is currently providing technical input for a Phase II, Stage 1 effort under the Air Force's Installation Restoration Program (IRP). The Phase II, Stage 1 effort involves the comprehensive confirmation and characterization of contaminant migration at hazardous waste sites on DOD installations. She was also the Task Manager during a Phase I effort, or installation assessment, of a government-owned, contractor-operated (GOCO) facility in Tucson, Arizona, under the Air Force's IRP. Phase I of the IRP involves a site visit and documentation of past and present industrial operations, past and present waste management practices, and the environmental setting. Identified waste sites are ranked based on their relative potentials for environmental impact and recommendations are made for Phase II. Other Phases of the IRP, including remedial action planning, were ongoing at this particular facility because of confirmed groundwater contamination problems. Therefore, this Phase I also included the documentation of these activities. Ms. Bramlett was also a primary technical contributor during a Phase I effort at a GOCO facility in San Diego, CA.

Ms. Bramlett was a Team Leader during a preliminary assessment for the DOD of waste resource conservation and recovery opportunities at eleven GOCO facilities. Besides overseeing the non-industrial waste study area of the project for all eleven facilities, Ms. Bramlett also worked on a more in-depth waste recovery feasibility analysis for one selected GOCO facility.

Ms. Bramlett was co-project manager of a project for the USEPA in which data was gathered on the composition of leachate from hazardous waste sites located throughout the United States. The data was used to assess the feasibility of formulating a synthetic leachate to test liner compatibility. Ms. Bramlett was also a member of a sampling team which visited various sites and sampled leachate for laboratory and field analysis.

Ms. Bramlett was a member of the field team conducting groundwater sampling at the LiPari Landfill in New Jersey, Superfund Site No. 1. Sample analyses results were used to assess the performance of implemented remedial actions.

Verified for accuracy by: Jennifer A. Bramlett Date: 4/23/86

SAIC

Ms. Bramlett's other field experience includes air sampling for asbestos in post offices in rural communities in western Pennsylvania and acting as a Document Control Officer during the geotechnical assessment of the hazardous waste disposal site Love Canal in New York. During the latter, she was responsible for ensuring adherence in the field to the project's Quality Assurance/Quality Control and Health and Safety plans. She additionally assisted in on-site hydrological testing conducted to characterize groundwater flow.

Under a project for EPA's Waste Identification Branch, Ms. Bramlett is evaluating petitions from generators to exclude a waste listed under 40 CFR Part 261, Subpart D. She is evaluating the delisting petitions for completeness and technical adequacy, making decisions of denial or acceptance, and preparing Federal Register Notices announcing proposed exclusions. Ms. Bramlett also contributed to a guidance manual for petition preparation.

Ms. Bramlett has also provided technical review, synopsis, and computer coding of public comments for the U.S. EPA regarding the Organic Chemicals and Plastics and Synthetic Fibers (OCPSF) Point Source Category Effluent Limitations proposed rule.

Ms. Bramlett was active in a multi-year Industry Studies Program for EPA's Office of Solid Waste. The program was an in-depth waste management assessment of chemical classes within several industrial segments. Ms. Bramlett participated in the waste management assessments of the chlorinated and brominated organics and carbamate industrial segments.

Ms. Bramlett was active in the U.S. EPA Technical Assistance Panels Programs for Regions III, V, and EPA Headquarters. The Programs provided assistance to state and local governments in both solid and hazardous waste management. For various technical assistance recipients, Ms. Bramlett assessed waste management options, evaluated waste management programs, and analyzed the feasibility of waste-to-energy recovery.

PUBLICATIONS

Bramlett, J., E. Repa, C. Furman. Installation Restoration Program Phase I - Records Search, Air Force Plant 44, Tucson, Arizona. Prepared for: Wright-Patterson AFB, Ohio; October 1985.

Burger, B., J. Bramlett, K. Boyer, C. Furman. Installation Restoration Program Phase I - Records Search, Air Force Plant 19, San Diego, California. Prepared for: Wright-Patterson AFB, Ohio; September 1984.

JRB Associates. Solid Waste Data - A Compilation of Statistics on Solid Waste Management within the United States. Prepared for: U.S. Environmental Agency, Office of Solid Waste and Emergency Response. EPA contract no.: 68-01-6000. August 1981.

Verified for accuracy by: Jennifer A. Bramlett Date: 4/23/86

SAIC

RICHARD H. BERRY
5203 Richardson Drive
Fairfax, Virginia 22032
Tel. (703) 323-5211

BACKGROUND SUMMARY

More than 25 years of experience in applying geology and geophysics to the assessment of engineering problems, mineral deposits, and groundwater conditions. Projects have involved 37 U.S. states and eight foreign countries, comprising an extensive range of geologic environments.

EDUCATION

PhD, Geology, Yale University, 1961
MS, Geology, Yale University, 1957
BA, Geology, Williams College, 1955
Graduate courses in Geophysics and Mathematics, George Washington University, 1969-1971

EXPERIENCE

Independent Consulting Geologist, 1979-Present

Performs a wide variety of domestic and foreign assignments, mainly for mining and engineering consulting firms. Principal efforts have involved:

- Stability of mines, tunnels and other underground structures.
- Foundation conditions and earthquake hazards.
- Coal and industrial mineral deposits.
- Groundwater conditions associated with commercial and domestic water supply, waste disposal, construction, and structural damage.
- Expert legal testimony.

Senior Geologist, Dames & Moore, Consulting Engineers, Washington, D.C., 1973-1979.

Directed geological and geophysical investigations for heavy construction projects, including:

- Foundation and construction conditions for dams, pipelines, open pit mines, fuel storage facilities and other major structures.
- Geological and geophysical studies for 12 nuclear power plants in the U.S. and abroad, including detailed fault studies and earthquake assessments.
- Stability of tunnels, mines, and other deep rock excavations.
- Site selection and environmental assessment of conventional and nuclear waste disposal sites.

Senior Scientist, Computer Sciences Corporation, Falls Church, VA, 1968-1973.

Performed varied research and consultant functions involving geology and geophysics. Major projects included:

- Comprehensive assessment of construction, environmental impact, and electrical ground conductivity of seven alternative U.S. sites for a major military communications system involving surface and deep underground emplacement of hundreds of miles of antenna cable (1971-1973).
- Analysis of costs and performance rates of drilling, blasting, and excavating techniques for computer simulations of quarry and underground coal mine operations.

Assistant Director of Operations, Environmental Research Corporation, Alexandria, VA, 1965-1968.

Assisted in managing 15-20 geologists, geophysicists and engineers employed in research of seismic ground motion and other effects of nuclear and conventional explosives. Typical projects included:

- Prediction of blast effects of nuclear testing at the Nevada Test Site.
- Design and implementation of seismic monitoring programs for construction and quarry blasting.

Chief Geologist, Roland F. Beers, Inc., Alexandria, VA, 1962-1965.

Directed geology staff in compiling and assessing geologic, geophysical and hydrologic information associated with proposed nuclear blast sites. Efforts included:

- Preparation of detailed plans and cost estimates adopted by the U.S. Corps of Engineers for a major exploration program to preceed proposed nuclear excavation of a canal across Central America.
- Inspection and evaluation of potential slope and dam failures associated with nuclear blasts in Colorado, New Mexico, Nevada, and Mississippi.

Geologist, Brown and Root, Inc., Houston, Texas, 1959-1962.

Inspected and evaluated geology, hydrology, and other construction aspects of tunnels, dams, pipelines, and missile silos; identified concrete aggregate sources and prepared cost estimates for constructing underground structures. In 1959-1960 assessed daily excavation conditions in the 26-mile Roberts Tunnel, Colorado.

Field Geologist, New York State Geological Survey, Albany, NY, 1956-1958.

Mapped a portion of the eastern Adirondack Mountains, interpreted structure and metamorphic derivation of plutons, and developed a local stratigraphic column for the Grenville metasediments.

Field Assistant, Matt S. Walton, Consulting Geologist, New Haven, CT, 1956.

Mapped and analyzed faults affecting roof stability in diversion tunnels of the Oahe Dam, South Dakota.

Geologist, Carter Oil Company, Mattoon, Illinois, Summer 1956.

Interpreted geophysical well logs and constructed isopachus maps of areas in Illinois and Kentucky.

PROFESSIONAL AFFILIATIONS

Geological Society of America, Association of Engineering Geologists, American Geophysical Union, Washington (D.C.) Geological Society, and American Association of Petroleum Geologists

PROFESSIONAL REGISTRATIONS

California #3463, Delaware #249, Oregon #460, Georgia #442, Virginia #135

RICHARD H. BERRY

SELECTED REPRESENTATIVE PROJECTS

Underground Mines and Tunnels

- Design and supervision of a boring program to define the nature of a thrust fault and its effects on future operations of an underground coal mine, Buchanan County, Virginia.
- Assessment of geologic conditions and presentation of expert testimony re-regarding potential surface damage from subway tunnel construction, Montgomery County, Maryland.
- Estimation of anomolous bearing pressures anticipated from thick sandstone strata above a proposed longwall coal operation, Wise County, Virginia.
- Assessment of potential effects of faults identified from Landsat imagery and areal photographs of three existing or proposed underground coal mines in Virginia and West Virginia.
- Estimation of underground construction conditions for fifteen tunnels and six missile silo complexes in the U.S., Canada and South America. Projects typically included quantification of overbreak, support requirements and water inflow, and location of concrete aggregate sources. Prepared bid estimates for six of the tunnels.
- Underground mapping and assessment of joints and faults in the diversion tunnels of Oahe Dam, S.D., as related to a major roof collapse.
- Assessment of daily construction conditions in the 26-mile H.D. Roberts Tunnel, Colorado, and derivation of tunnelling costs and performance indices for various geologic conditions.

Foundation Conditions

- Assessment of potential surface damage from piping and other subsidence hazards associated with underground anthracite workings, Scranton, Pa.
- Investigation of landslides and slope stability for a proposed pump storage facility in Virginia.
- Design and supervision of a drilling program to assess stability of future open cuts for a phosphate mine in North Carolina.
- Investigation of geologic and construction conditions affecting overbreak in footing excavations for the New Walter Reed Hospital, Washington, D.C.
- Preparation of plans and cost estimates for geotechnical exploration of a proposed 150-mile electrical transmission line in Montana.
- Assessment of the effects of karst conditions on foundation stability for a proposed heavy construction project in western Maryland.

- Design and supervision of a boring program to assess the stability of deep rock excavations and construction conditions of several miles of pipeline for a proposed water pumping and treatment station in northern Virginia.
- Investigation of geologic conditions pertinent to remedial action required to avoid recurrence of landslide damage to a pipeline in western Pennsylvania.
- Assessment of geologic and construction conditions pertinent to reducing overbreak of open cut tunnel excavations in Montgomery County, Maryland and Baltimore, Maryland.
- Geologic correlation and extrapolation of soils properties for site selection of electrical transmission lines in eastern Virginia.

Mineral Deposits

- Estimation of reserves for six bituminous and anthracite coal properties in West Virginia and Pennsylvania.
- Economic assessment of sand and gravel deposits in Texas, Maryland, New Hampshire and Colorado.
- Identification and economic assessment of alternative crushed stone sources for the Norfolk area, Virginia.
- Identification of volcanic ash deposits to serve as concrete pozzolan for the Yellowtail Dam, Montana.
- Estimation of the current economic potential of an abandoned gold mine, Fairfax, Virginia.
- Analysis of geologic and geophysical data for three nickel deposits in Maine, and participation in exploration planning, computerization of reserves and open pit mine designs.
- Assessment of world wide marketability of Peruvian bentonite.
- Geologic and economic appraisal of a diatomite deposit, Richmond County, Va.

Groundwater

- Air photo interpretation, field investigation, and design of an exploratory boring program to assess groundwater reserves associated with block faulting in the Dead Sea Rift Valley, Jordan.
- Presentation of expert testimony regarding groundwater conditions of a landfill site in Maryland.
- Identification and assessment of a fault zone aquifer to serve the snow-making requirements of a proposed ski resort near Harpers Ferry, West Virginia.
- Investigation of swimming pool damage allegedly caused by an unusually shallow water table, Washington, D.C.
- Assessment of lightning as a cause for damage to a water well casing, Fauquier County, Virginia.

- Field investigations to identify a means of renewing geothermal waters for a health spa resort in northern Jordan.
- Design and supervision of a drilling and geophysical program to assess the anticipated underflow for a major proposed earthfill dam, Montgomery County, Maryland.
- Field investigations and assessment of groundwater information to assess the hydrologic characteristics of karst terrain proposed for underground petroleum storage, southwestern Virginia.
- Design and supervision of a drilling and monitoring program to assess groundwater conditions associated with leakage of an underground propane storage cavern, northern Virginia.

Structural Geology and Earthquake Assessment

- Design and supervision of comprehensive fault studies for eight nuclear power plant sites in the U.S. and abroad, including definition of age of fault offsets and earthquake potential.
- Preparation of geologic and seismologic portions of Safety Analysis Reports for five nuclear power plants in the U.S. and abroad, and senior technical review of five others.
- Design and supervision of deep seismic reflection profiling of basement faults beneath the Maryland Coastal Plain.
- Determination of the earthquake risk for several Middle East drilling platforms and a proposed liquid natural gas terminal on Cook Inlet, Alaska.
- Design and supervision of an exploratory program to define a buried sequence of emergent wave cut platforms to establish the age and earthquake potential of faulting at the site of a proposed liquid natural gas facility, Point Conception, California.

Waste Disposal and Environmental Assessments

- Field investigation and assessment of exploration data to define the geologic and hydrologic characteristics of four sludge disposal sites in Maryland.
- Preparation of preliminary plans and cost estimates for geologic and geophysical exploration of alternative nuclear waste disposal sites in New England.
- Design and supervision of a site selection program to define alternative landfill sites in Montgomery County, Maryland.
- Preparation of environmental impact statements for strategic oil storage in three Gulf coast salt domes and limestone mines in Kentucky and Ohio.
- Evaluation of the relative geologic and hydrologic suitability of numerous U.S. salt mines as disposal sites for radioactive waste.

Expert Testimony

U.S. Land Commission, Baltimore, Maryland

U.S. Military Court of Appeals, Alexandria, Virginia

General District Court, Fairfax, Virginia

Board of Supervisors, Montgomery County, Maryland

Board of Supervisors, Fairfax, Virginia

Atomic Safety Licensing Board (NRC)

Advisory Committee on Reactor Safety (NRC)

Virginia Corporation Commission, Richmond, Virginia

U.S. Senate Armed Services Committee

RICHARD T. EADES

EDUCATION

West Virginia University, B.S., Geology (1982)

EXPERIENCE

Mr. Eades is a geologist with the Applied Technologies Group of SAIC. He is diversely experienced in regard to studies involving hazardous waste site investigation, characterization and remediation. He is currently involved in a confirmation/characterization study of groundwater and surface water contamination at Dover Air Force Base under a Phase II investigation of the U.S. Air Force's Installation Restoration Program. Under this program he has been responsible for development of well installation, sampling and monitoring plans, subcontracts procurement, supervision of drilling operations, assistance in soils, surface water, and ground water sampling, interpretation of geologic, hydrologic, and chemical analytical data, and report preparation. In addition, Mr. Eades recently completed another Phase II effort at McEntire ANG Base, Columbia; South Carolina, where he supervised drilling and installation of 11 groundwater monitoring wells.

Mr. Eades also assisted in the design of a parallel Phase II drilling and sampling program at Niagara Falls Air Force Reserve Facility by inputting to technical and cost proposals, scheduling, staffing and subcontractor coordination. In addition, Mr. Eades served as a team member on the Phase I investigation at Air Force Plant PJKS in Waterton, Colorado. His responsibilities included performing a site investigation to determine past and current waste handling practices, record searches and interviews to identify the environmental conditions present at the site, an evaluation of the potential for environmental contamination, recommendation for future groundwater and surface water monitoring and final report preparation.

Mr. Eades has a wide range of experience under a variety of Environmental Protection Agency studies. He has served in numerous capacities during an ongoing evaluation of the effectiveness of an asphalt cap as a remedial action at the Western Processing Company Superfund Site in Kent, Washington. Under this program Mr. Eades was responsible for assisting in the design of asphalt, soils and groundwater sampling and analysis plans, supervision of asphalt coring operations, adherence to health and safety protocol, coordination of laboratory permeability and percent air voids testing, interpretations of test results, and making recommendations on hydraulic asphalt mix and paving designs for future remedial applications. He has recently completed a separate case study on the history to date of remedial actions and their effectiveness at the dioxin contaminated Denney Farm Site in Aurora, Missouri. During this case study, Mr. Eades was solely responsible for coordination with EPA Region VII to access files and records and conduct interviews to document remedial design, execution and performance. Evaluation included determining the effectiveness of waste exhumation, site closure, on site storage and microbiological degradation.

Verified for accuracy by: R. Eades Date: 7/[illegible]

SAIC

Mr. Eades was also a key team member under an EPA program to solicit and evaluate offers to test emerging technologies to clean up hazardous waste sites and spills. This involvement included Request for Proposal development, design of evaluation criteria, proposal scoring and recommendations on various proposed technologies including sorbents, in situ vitrification, and circulating bed incineration. Under various other EPA programs, Mr. Eades has provided:

- Confirmation of hydrogeologic data at the Vertac Site in Jacksonville, Arkansas.
- Description of concepts and test results for permeable treatments beds and block displacement as methods to clean up or contain contaminated groundwaters.
- And technical and cost proposals for expanding the computer data base of remedial action case histories.

Mr. Eades served under a DOE sponsored project in review and document preparation capacities for the Nuclear Waste Management Program at the Nevada Test Site. He evaluated state-of-the-art technologies and documents regarding the regulation of borehole shaft sealing of experimental wells to insure the integrity of the host medium in which hazardous waste disposal sites could be located.

Mr. Eades also has a variety of experience in the oil and gas industry in drilling, coring, completion and well testing capacities. Prior to transferring to SAIC/McLean, Mr. Eades completed a project for Gas Research Institute under which he had the responsibility of generating a geologic framework for Meigs County, Ohio, testing the relationship between gas production and photolineaments and sampling and analyzing core to determine matrix properties, fracture occurrences and offgassing data. He was responsible for providing production decline curve analyses and geologic mapping efforts, including structure contour and isopach maps incorporating data on over 300 producing wells. This work assisted in determining reservoir characteristics such as directionality of flow within a naturally fractured reservoir as well as quantifying fracture occurrences through the use of core analysis, mini-hydraulic fracturing treatments and downhole camera surveys.

Mr. Eades served as a field geologist during drilling, completion and well testing operations under the previously mentioned program and under the Department of Energy's Offset Well Test Program. He was also responsible for installing and monitoring data acquisition systems, conducting flow tests, sampling gases, placement of downhole tools (packers and pressure monitoring probes), well log interpretations and assisting in well cleanup operations.

Verified for accuracy by: _____ Date: _____

SAIC

Mr. Eades also has experience in the coal mining industry with regard to defining hydrologic impacts for existing and proposed mines. He conducted field investigations, and geotechnical evaluations of over 80 surface and underground mining operations in three Appalachian coal mining states. These evaluations involved field data acquisition, overburden sampling and analysis, water monitoring station data analysis and geologic and hydrologic interpretations regarding known or predicted environmental impacts from mining operations in West Virginia, Virginia and Kentucky. Mr. Eades was responsible for proposing groundwater and surface water monitoring stations for proposed sites and identifying shortcomings of monitoring station locations for existing sites.

PUBLICATIONS

Installation Restoration Program Phase I - Records Search Air Force Plant PJKS Waterton, Colorado, 1984, USAF, AFESC/DEV, Tyndall AFB, Florida and ASD/PMD, Wright-Patterson AFB, Ohio.

Multiple Well Transient Test Program in Meigs County, Ohio, Gas Research Institute 5081-213-0605.

Evaluation of the Asphalt Cover at the Western Processing, Inc., Superfund Site (Draft Final Report) EPA 68-03-3113.

Verified for accuracy by: Richard T. Eades Date: 7/15/87

SAIC

EDUCATION

University of Pennsylvania: M.R.P., Environmental Planning (1980)
University of Pennsylvania: Coursework toward M.S., Geology
Franklin and Marshall College: B.A., Geology (1978)

EXPERIENCE

Mr. Lapins is an environmental scientist with JRB's Waste Management Department. His project involvement has included: project and task management, coordinating and conducting field investigations at controlled and uncontrolled hazardous waste sites including, supervising the installation of groundwater monitoring wells and groundwater, soil and sediment sampling; data analysis; contaminant transport assessment; hydrogeologic and geomechnical evaluation; and alternative site remediation analysis.

Mr. Lapins is currently a Project Manager for a Department of Defense (DoD), Installation Restoration Program (IRP), Phase II hazardous materials site investigation at McEntire Air National Guard Base, S.C. The project involves investigating and determining the magnitude and extent of contaminant migration from seven disposal sites; involving the installation of twenty-three groundwater monitoring wells and the sampling of contaminated groundwater, surface water and soils. Mr. Lapins was responsible for developing all phases of this investigation from investigatory approach at each site including: monitoring network design, drilling, well specification and sampling plan preparation to costing, scheduling and staffing.

Mr. Lapins recently managed a task for EPA's Emergency Response Division which involved updating EPA's "Acceptance List" for dispersants and other chemical countermeasures for oil spills, and reformatting technical test data for each product, for inclusion in Subpart H of the National Contingency Plan as Appendix C of 40 CFR 300. The "Acceptance List" and reformatted technical product test data bulletins will serve to facilitate an expeditious selection of appropriate chemical countermeasures by On-scene Coordinators in EPA Regional offices and U.S. Coast Guard Districts in the event of a spill.

Mr. Lapins also managed a task involving the preparation of a Federal Register Notice publishing a Final Rule amending subpart H of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP) (40 CFR Part 300) specifying a process in which dispersants, surface collecting agents, and biological additives may be added to EPA's NCP Product Schedule. As well as preparing the text, Mr. Lapins compiled, evaluated, and addressed public comments to the proposed regulation for inclusion in the Final Rule.

Verified for accuracy by: _____ Date: _____

SAIC

Mr. Lapins has had considerable experience supervising the drilling and installation of groundwater monitoring wells, and with conducting groundwater sampling and soil/sediment sampling. Collectively, he has played a supervisory role in projects which involved the installation of more than drilling methods, and has performed groundwater sampling of more than 90 wells for county and federal clients.

For the U.S. Army, Mr. Lapins investigated and evaluated soil, sediment, and groundwater contamination resulting from munitions manufacturing activities at two Army depots in Illinois and Tennessee. His involvement in these DoD IRP projects included: developing novel sampling and health and safety procedures for sampling reactive wastes, coordinating field sampling activities with laboratory activities in accordance with the analytical requirements of samples to insure accurate analytical results, supervising the drilling and installation of groundwater monitoring wells, obtaining core and grab samples of sediments containing high concentrations of explosives, groundwater sampling, geotechnical and hydrogeologic data analysis, remedial action evaluation, and final report preparation.

Mr. Lapins also participated in an IRP Phase II hazardous materials site investigation at Hancock Field, N.Y., for the U.S. Air Force. His involvement in this project included supervising the installation of groundwater monitoring wells, evaluating analytical results for sampling activities conducted at the base, preparation of recommendations for additional site investigatory and remedial measures needed and final report preparation.

For the EPA, Mr. Lapins supervised the drilling and installation of groundwater monitoring wells at the Lipari Superfund Site in New Jersey. His responsibilities included overseeing well drilling and installation operations, enforcement of health and safety protocol (Level A Protection), collection and characterization of core samples and the maintenance of daily logs. Mr. Lapins also participated in a study of groundwater contamination from an active hazardous waste disposal site in Anne Arundel County, Maryland, where he performed groundwater sampling and data analysis. His involvement with groundwater sampling and monitor well installation has given him a good working knowledge of EPA and U.S. Army Toxic and Hazardous Materials Agency quality control/quality assurance and chain of custody procedures.

Mr. Lapins has participated in two IRP Phase I investigations at Olmsted AFB (Harrisburg International Airport) and Air Force Plant PJKS near Denver, CO for the U.S. Air Force. For these projects Mr. Lapins conducted record searches and investigated past hazardous materials management practices at each of the bases; conducted site surveys, identifying hazardous material disposal sites, rated sites using the HARM rating methodology, and prepared recommendations for future site investigatory measurers.

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SAIC

For EPA's Office of Policy Analysis (OPA), Mr. Lapins provided technical support for a national groundwater contamination modelling effort. For this project, Mr. Lapins developed a data base for examining and evaluating the risk of groundwater contamination and health effects associated with the use of road salts for highway deicing purposes. The results of his analysis will be compared with other sources of groundwater contamination for relative risk assessment to aid EPA in developing groundwater protection policy for the nation.

Mr. Lapins participated in an EPA project to evaluate the validity and accuracy of statistical test procedures specified in 40 CFR 265.93 of RCRA for monitoring groundwater quality at Interim Status facilities. His role in this project included: reviewing site information and groundwater analytical data for facilities throughout the country, providing hydrogeologic evaluations, and data coding for computer analysis.

For the EPA's Office of Solid Waste, Mr. Lapins has taken part in the development of a large computerized data base for characterizing wastes and assessing waste management practices within several segments of the Organic Chemical Manufacturing Industry. The data base which characterizes and tracks manufacturing processes, residual streams, and waste management practices will provide technical support to EPA for the development of industry specific guidelines (RCRA Phase III regulations) for hazardous waste management. Mr. Lapins' role in the project has included reviewing RCRA 3007 Questionnaires and sampling and analysis data, and coding manufacturing processes, process products, residual streams, and waste management practices for chlorinated organic, industrial organic, dye and pigment, and plastic and resin manufacturing industries. Mr. Lapins also aided in the establishment of a computerized status matrix for the EPA to track the progress of RCRA delisting petitions through regulatory review.

Prior to joining JRB, Mr. Lapins was employed as an environmental scientist by Ecolsciences, Inc., where he managed task assignments and prepared report elements for EIS's and environmental assessments specializing in the inventory, analysis, and evaluation of geologic, pedologic, and hydrologic conditions with special emphasis on groundwater impact assesments. A large segment of his responsibilities included performing siting and site suitability/feasibility analysis for municipal wastewater treatment facilities, deep well wastewater injection and land application of municipal wastewater and sludge at sites in Pennsylvania, Maryland, and Delaware. In addition, Mr. Lapins participated in the development of environmentally sensitive growth management plans for Stafford Township, Ocean County, New Jersey.

Verified for accuracy by:_____ Date:_____

PUBLICATIONS

Installation Restoration Program Phase I - Records Search, Final, Air Force Plant PJKS Waterton, Colorado. U.S. Air Force AFESL/DEV, Tyndal AFB, Florida and ASD/PMD Wright-Patterson AFB, Ohio. September, 1984.

Installation Restoration Program Phase I - Records Search, Harrisburg International Airport (Formerly Olmsted Air Force Base) Middletown, Pennsylvania. U.S. Air Force AFESL/DEV, Tyndall AFB, Florida. April, 1984.

Installation Restoration Program Phase II - Confirmation/Quantification, Stage I, Final Report, for Hancock Field, New York. U.S. Air Force, OEHL, Brooks AFB, Texas. December, 1984.

Draft Environmental Impact Statement, Currituck County, North Carolina Outer Banks Access. Department of Transportation, Raleigh North Carolina. March, 1981.

Environmental Assessment of Construction Grants Projects (revisions). U.S. Environmental Protection Agency, Office of Water Program Operations, Washington, D.C. January, 1979.

Draft Environmental Impact Statement, Little Patuxent Water Quality Management Center (Savage Plant), Howard County, Maryland. U.S. Environmental Protection Agency, Philadelphia, Pennsylvania. October, 1981.

Draft Environmental Impact Statement, Leola Sewer Authority Facilities Plan, Upper Leacock Township, Pennsylvania. U.S. Environmental Protection Agency, Philadelphia, Pennsylvania. October, 1981.

Draft Environmental Impact Statement, Wastewater Management Facilities, City of Rehoboth Beach, Sussex County, Delaware. U.S. Environmental Protection Agency, Philadelphia, Pennsylvania. January, 1982.

Draft Environmental Impact Statement, Wastewater Management Facilities, City of Lewes, Sussex County, Delaware. U.S. Environmental Protection Agency, Philadelphia, Pennsylvania. October, 1981.

Verified for accuracy by: _____ Date: _____

SAIC

JOHN P. MEADE

EDUCATION

Manhattan College: B.C.E., Civil Sanitary Engineering (1955)

SUMMARY

Mr. Meade has 26 years of experience in sanitary, industrial hygiene, and bioenvironmental engineering, and is certified as an Associate Public Health Engineer in the State of New York. He is a Senior Project Manager at SAIC, working as a senior technical reviewer for a multi-task contract for remedial actions on uncontrolled hazardous waste sites. He joined SAIC as the Project Manager of a Department of Labor (DOL) contract to provide OSHA with on-site consultation services to assist small businesses in Pennsylvania.

Mr. Meade, under the terms of an EPA contract addressing the investigation of remedial actions of uncontrolled hazardous waste sites, has functioned as one of SAIC's senior technical reviewers. One of his assigned tasks is to review the majority of twenty detailed case study analyses selected from an inventory of nationwide remedial actions. The sites were selected based upon their overall priority and the remedial actions were evaluated from both their effectiveness in meeting the objectives of the site action and also from a cost standpoint. He is also the Project Officer for 6 task orders under this contract, involving various hazardous waste research & development studies.

Mr. Meade is presently supporting the Manager for the Waste Management Department and shares in the responsibility for monitoring and administering a $4 million EPA R & D mission contract that has 29 tasks. He also manages two additional tasks that address the design and monitoring of protective covers for hazardous waste lagoons, and design of decontamination equipment and procedures for use at hazardous waste sites. Mr. Meade was the Program Manager for SAIC's Basic Ordering Agreement with Tyndall AFB to perform Phase 1, 3, and 4 Installation Restoration Program tasks at Military installations throughout the country. Mr. Meade is also the Program Manager for a large multi-task contract with the U.S. Air Force Occupational & Environmental Health Laboratory (USAFOEHL) for Phase II Installation Restoration Program confirmation studies. He is presently responsible for concurrent Phase II efforts at 6 Air Force installations. In addition, he has responsibility for performing Quality Assurance/Quality Control and functions as Senior Health and Safety Advisor at many of SAIC's field efforts, such as the #1 rated Superfund site in Glosgow, New Jersey.

Prior to joining SAIC, Mr. Meade was an Air Force Colonel and Vice Commander of the USAF Occupational and Environmental Health Laboratory. He directed and monitored the daily efforts of 150 professional and support personnel, including assisting the AIHA certified laboratory to ensure compliance with applicable Federal, State, and local standards. In addition, as Chief of the Consultants

Verified for accuracy by: John P. Meade Date: 7/29/85

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Division, he had the responsibility for managing almost fifty environmental projects for the Air Force. This included field investigations of Air Force installations to identify potential health and environmental effects from pollutants as well as making recommendations for corrective actions.

Verified for accuracy by: John P. Meade Date: 7/29/85

SAIC

EDWARD W. REPA

EDUCATION

West Virginia University, Ph.D. Hydrology (1981)
West Virginia University, M.S.F. Hydrology (1977)
Baldwin-Wallace College, B.S. Biology (1975)

EXPERIENCE

Dr. Repa is currently a Program Manager in the Applied Technologies Division of the Waste Management Department. In this capacity, he directs the efforts of geologists, hydrologists, soil scientists and environmental scientists on projects directed at resolving hazardous waste management, technical and policy issues. Dr. Repa is currently managing approximately $1.5 million in tasks under the Air Force's Installation Restoration Program and $1.0 million in tasks under a task order contract with EPA's Office of Research and Development.

Dr. Repa is currently Project Manager (PM) and Principal Investigator (PI) on two Superfund research and development programs. One program is being performed at the Lipari Landfill in Pitman, NJ (Superfund Site Number 1) to assess the performance of the slurry wall and surface cap installed as the remedial action. The other program is being performed at the Western Processing Site in Kent, WA (Superfund Site Number 48) to assess the effectiveness of the asphalt surface cap in minimizing groundwater recharge.

Dr. Repa is the PM for an EPA project that is developing a manual on proven and innovative technologies for controlling the migration of hazardous waste leachate plumes. He led and developed one of the chapters of this manual entitled Groundwater Pumping. This chapter dealt with all aspects of well systems for plume control including well theory, design, installation, and costs. He is also serving as a Senior Technical Reviewer for the other chapters: Plume Dynamics, Plume Delineation, Control Technology Selection, Subsurface Drains, Impermeable Barriers, and Innovative Technologies.

Dr. Repa is also managing or has managed numerous projects under the Air Force's Installation Restoration Program (IRP). These include both Phase I-Records Search and Phase II-Confirmation/Quantification projects. IRP projects that he has participated in include: Phase I--Olmsted AFB, Harrisburg, PA; Air Force Plant PJKS, Waterton, CO; Air Force Plant 44, Tucson, AZ; and Phase II--Hancock Field, Syracuse, NY; Niagara Falls AFB, Niagara Falls, NY; Dover AFB, Dover, DE; Homested AFB, Homested, FL; Charleston AFB, Charleston, SC; McEntire ANG, Columbia, SC. In the role of PM/PI on these projects, Dr. Repa has developed groundwater monitoring plans, supervised the installation of monitoring wells and the collection of water quality samples, and coordinated the interpretation of hydrogeologic data.

Verified for Accuracy by: Edward W Repa Date: 17 JAN 85

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In addition to these current projects, he has also served as PM/PI on over thirty hydrogeologic impact assessments for the coal mining industry. In this role, he also supervised the installation of many monitoring wells, participated in the collection of groundwater, surface water and biotic samples, and coordinated the data interpretation and prediction of the probable hydrologic impacts from the mining operations.

Dr. Repa has also served as a Project Manager or Principal Investigator on a number of projects including:

- A theoretical evaluation of subsurface drains for use in landfills that are partially or fully located below the groundwater table.
- A review, evaluation, and critique of existing numerical and analytical groundwater models for their possible application to risk assessments associated with hazardous waste sites.
- The development of a specification manual on engineering systems that can be used to accelerate stabilization of hazardous waste piles or deposits.
- The development of groundwater monitoring plans and protocols for a Part B applicant at a hazardous waste site.

PUBLICATIONS

Repa, E.W. and C. Kufs. 1985. Leachate Plume Management. United States Environmental Protection Agency (in publication).

Repa, E.W., E.F. Tokarski, and R.T. Eades. 1985. Evaluation of the Asphalt Cover at the Western Processing, Inc. Superfund Site. EPA/ORD (in publication).

Kufs, C. and E. Repa. 1984. Leachate Plume Management. United States Environmental Protection Agency, MERL, Cincinnati, OH. EPA-600/9-84-007.

Repa, E., A. Wickline, N. DeSalvo and A. Lapins. 1984. Installation Restoration Program, Phase II-Confirmation/Quantification, Stage 1, Hancock Field, New York. USAF, OEHL, Brooks AFB, Texas.

Bramlett, J., E. Repa, J. Margolis, C. Furman, and S. Mahmud. 1985. Installation Restoration Program, Phase I - Records Search, Air Force Plant 44, Tuscon, AZ. USAF, AFESC/DEV, Tyndall AFB, FL.

Burgher, B., E. Repa, A. Lapins, R. Eades, and J. Margolis. 1984. Installation Restoration Program Phase I-Records Search, Air Force Plant PJKS, Waterton, CO. USAF, AFESC/DEV, Tyndall AFB, FL.

Repa, E., B. Burgher, A. Lapins, C. Furman, and W. Ellis. 1984. Installation Restoration Program Phase I - Harrisburg International Airport (Formerly Olmsted Air Force Base), Middletown, PA. USAF, AFESC/DEV, Tyndall AFB, FL.

Verified for Accuracy by: Edward W Repa Date: 17 JAN 85

SAIC

Kufs, C., P. Rogoshewski and E. Repa. 1982. Alternatives to Groundwater Pumping for Controlling Hazardous Waste Leachates. National Conference on Management of Uncontrolled Hazardous Waste Sites, Washington, D.C. p. 146-149.

Kufs, C., K. Wagner, P. Rogoshewski, M. Kaplan, and E. Repa. 1983. Procedures and Techniques for Controlling the Migration of Leachate Plumes. Ninth Annual Research Symposium, Land Disposal, Incineration and Treatment of Hazardous Waste. USEPA, Cincinnati, May 2-4.

Repa, E., E. Tokarski, and E. McNicolas. 1982. The Establishement of Guidelines for Modeling Groundwater Contamination from Hazardous Waste Facilities. EPA-OSW, Washington, D.C.

Repa, E., R. Fithian, H. Hefner, and J. Hoffman. 1981. Prediction of the Probable Hydrologic Consequences of Mining by the Demotto Peerless Coal Company, WV SOAP #001. Division of Reclamation, Department of Natural Resources, State of West Virginia.

Fithian, R., E. Repa, J. Meeks, and N. DeSalvo. 1981. Prediction of the Probable Hydrologic Consequences of Mining by the Winsor-Pittman Coal Company, WV SOAP 012. Division of Reclamation, Department of Natural Resources, State of West Virginia.*

Repa, E.W. 1981. Rainfall Catch Errors Associated with Circumambient Obstructions. Dissertation, West Virginia University.

Tajachman, S.J., R. Lee, and E.W. Repa. 1978. Rainfall Additaments to Subsurface Water in a Young Pine Plantation. Water Resource Bulletin 15(2):381-6.

Lee, R., S. Tajachman, D.G. Boyer, and E.W., Repa. 1977. Normal Precipitation in West Virginia, West Virginia Agriculture and Forestry 7(2):12-8.

*Numerous other hydrologic assessments performed; full listing available upon request.

Verified for Accuracy by: Edward W Repa Date: 17 JAN 85

SAIC

ZUBAIR A. SALEEM

EDUCATION

New Mexico Inst. of Mining & Tech.: Ph.D., Geoscience (Hydrology) (1969)
Panjab University: M.Sc., Geology (Geophysics) (1961)
Panjab University: B.Sc., Physics and Math (1959)

University of California, Los Angeles - Short Course - Systems Analysis of Large Scale Water-Resource Systems - 1968.

WORK SUMMARY

Dr. Saleem is a Senior Scientist with more than 20 years experience in quantitative geohydrologic studies including computer modeling, field studies, groundwater quality investigations and groundwater resource evaluations. His experience includes hazardous waste site investigations, contaminant transport and geohydrologic assessments.

PROFESSIONAL EXPERIENCE

Dr. Saleem is participating in several hazardous-waste site investigations, including the hydrogeologic investigations for in situ treatment of contaminated ground water and soils at Kelly Air Force Base, Texas, and for the Stringfellow hazardous waste site in California.

He developed the model for the Kelly Air Force Base Groundwater Bioreclamation. The model was used for the design of pumping-injection well system such that there are no adverse environmental effects on adjacent groundwaters. He also developed a sensitivity analysis model based on the EPA's proposed model for delisting hazardous waste sites.

He has also been involved with investigations of hazardous waste sites, with groundwater aspects of environmental reports and final safety analysis reports for power plants, with groundwater investigations for electric power generation facilities in North Carolina, Washington, Florida and the Phillippines. He has been working on modeling of contaminant transport and dispersion in aquifers, and with groundwater investigations for a coal gasification plant in Kentucky, for power plant siting and seepage studies. Examples of specific projects are:

Dr. Saleem was the lead on the geologic, hydrologic and geophysical investigations for site characterization for two hazardous waste sites. The site characterization plans were approved by the regulatory agencies for a hazardous waste site for a confidential client in Fulton County, New York, and for a confidential client in Monmouth County, New Jersey. He was responsible for the supervision of Phase I field investigations and for the design of Phase II field activities at the two sites.

Verified for accuracy by: Zubair A Saleem Date: 3/12/85

He developed ground-water simulation models for the two well fields, National Power Corporation of Philippines for the evaluation of long-term yield of aquifers to supply ground water to the power plant. He also determined the hydrologic budgets for the two areas.

U.S. Department of Energy's Licensing Project Manager (LPM) Project for the Isolation of High Level Radioactive Waste ($19 million). As leader of the geosciences-geotechnical staff on the LPM Project, he directed the activities of the staff, coordinating all geotechnical inputs to the Project Tasks, and advising the Project Manager on geotechnical and budgetary matters.

He performed site specific and regional ground water analyses for ground water supply and for transports of contaminants for accident analysis scenario. Shearson Harris Nuclear Power Plant, North Carolina. Developed the ground water monitoring program for the plant site and responded to questions and provided input to the Nuclear Regulatory Commission hearings.

He has evaluated ground-water related inputs to the licensing documents Safety Analysis Reports for several nuclear power plants located in different hydrogeologic settings, including: St. Lucie Nuclear Power Plant, Florida Power Light Co.; Waterford Unit 3, Louisiana Power Light Co.; WPPSS Units 3 and 5, Washington Public Power Supply System; Philippines Nuclear Power Plant Unit 1, National Power Corporation; and Shearon Harris Nuclear Power Plant, Carolina Power Light Co.

Dr. Saleem was Project Coordinator and lead for all investigations for the Eastern Geothermal Drilling Project, Lewes, Delaware, U.S. Department of Energy. He developed the Project Management Plan and the Well Plan for the 9,000 feet deep geothermal well on the East Coast in Delaware.

He performed analyses for determining the feasibility of developing and exploiting the geothermal resources in the area of Berlin, Maryland for the district heating-cooling Project. U.S. Department of Housing and Urban Development.

For the St. Johns River Power Park (coal-fired power generation units), Florida Power Light Co., and Jacksonville Electric Authority, he evaluated the geohydrology, including the performance and analysis of pump tests, construction dewatering plans, and performance of slurry wall and grout curtains.

Dr. Saleem was also Associated Professor in charge of Hydrology Program at the University of Illinois, Chicago, responsible for teaching and research in groundwater hydrology. He taught undergraduate and graduate courses including advanced groundwater hydrology, groundwater management, engineering geology, computer applications in geology, hydrology, hydrogeochemistry, environmental geology, and introductory geology. He was responsible for the development of the water quality laboratory.

Verified for accuracy by: Zubair A. Saleem Date: 3/12/85

Developed computer models for the simulation of transport of contaminants in aquifer systems; models for the drawdown distribution due to well fields in coupled leaky aquifers; a study for the optimal utilization of water resources of Northeastern Illinois; analysis of aquifer characteristics of Long Island for the Suffolk County, New York; investigation of the clogging and contamination of aquifers due to artificial recharge; investigation of effects of road salts on quality of waters of an urban basin; study of the hydrogeochemistry of ground waters of the Chicago Metropolictan area; evaluation of underground compressed air energy storage-underground pumped hydro storage development cost and potential; heat pump centered integratred community energy systems using aquifers; and review of mathematical, experimental, and computer models for the simulation of seepage from uranium tailings for the U.S. Department of Energy through ANL.

Responsible for the supervision of groundwater hydrology aspects of projects for Harza Eng. Company for one year while on leave from the university. Projects included the evaluation of the groundwater contaminaiton potential from a disposal pond site; evaluation and control of seepage from a large dam on a hydro-electric project; potential of artifical recharge of ground water in the Great Salt Lake basin; Urban Storm Water Quality Model.

Dr. Saleem was the co-principal investigator of the Pecos River Basin Interdisciplinary Project involving quantitative analysis of a complex overdrawn irrigated basin in a semiarid climate Supervised assistants and taught the course on "Theory of Groundwater Motion." Principal Investigator, "simulation of coupled leaky aauifer systems," funded by OWRR. Developed a stochastic dynamic programming model; a method for the simulation of flow in multiaquifer systems; computer method for the piping test analysis; salt-water encroachment in leacky aquifers and times of travel for an impulse in multiaquifer systems. He has also conducted gravity and magnetic surveys of over 1000 square miles: (1) Potwar Basin for the identification structural traps for oil exploration; and (2) Swat State area for defining the origin of granitic masses. Seismic refraction survey for the Tarbela dam site. Performed electrical resistivity surveys of Babar Kachh dam sites and of Quetta Valley in Baluchistan for the location of water-bearing gravel lenses.

ARTICLES, PRESENTATIONS, PUBLICATIONS, AND REPORTS

(Selected from a List of More Than 65)

Electrical resistivity investigations of the Baber Kachh dam sites, Sibi District, Pakistan: Geol. Bull. Pan. Univ., no. 4, 17-22, Dec., 1964.

A computer method for pumping-test analysis: Journal of Ground Water, v. 8, no. 5, 21-24, 1970.

Dynamic Programming Model and Quantitative Analysis, Roswell Basin, New Mex: N.M. Water Resources Research Institute Report No. 10, pp. 180, (with C.E. Jacob), January, 1971.

Verified for accuracy by: Zubair A Saleem Date: 3/12/85

Optimal use of coupled leaky aquifers, Water Resources Research, vol. 7, no. 2, p. 382-393, (with C.E. Jacob), April, 1971.

Lead content of soils along Chicago's Eisenhower and Loop-Terminal Expressways, Arc. of Environmental Contamination and Toxicology, v. 1, no. 3, 209-233, (with W.C. Coello and M.A.Q. Khan), 1973.

Clogging in simulated glacial aquifers due to artificial recharge: Water Resources Research, v. 9, no. 4, 1047-57, (with David P. Ripley), 1973.

Method for numerical simulation of flow in multiaquifer systems: Water Resources Research, v. 9, no. 5, October, 1973.

Drawdown distribution due to well fields in coupled leaky aquifers: 2. Finite aquifer system: Water Resources Research, v. 10, no. 2, April, 1974.

Chloride balance of an urban basin in the Chicago area, Water Resources Research, v. 10, no. 5, (with Gerald M. Wulkowicz), October, 1974.

Hydrogeochemistry of carbonate groundwaters of an urban area: Water Resources Research, v. 10, no. 6, December, 1974 (with David T. Long).

Mechanical energy storage: compressed air and underground pumped hydro, with H.H. Chiu, L.W. Rodgers, R.K. Ahluwalia, G.T. Kartsounes and F.W. Ahrens, Journal of Energy, vol. 3, no. 3, 1979.

Determination of recharge rate using temperature-depth profiles in wells, Water Resources Research, with J.M. Boyle, vol. 15, no. 6, 1979.

Determination of long-term yield of well fields through computer simulation, Ann. Meeting of Assoc. of Engineering Geologists, Dallas, Texas, 1980.

Geohydrologic aspects of high-level radioactive waste repository licensing, annual meeting of The Geological Society of America, SC Section, 1983.

Geologican and hydrological aspects of low-level radioactive waste disposal facility siting and licensing, Annual Meeting of the Geological Society of America, South-Central Section, 1983.

Tectonic stability aspects of high-level radioactive waste repository siting and licensing, with N.R. Tilford and R.P. Cannon, Proceedings of the waste Management Symposium, 1983.

Geohydrologic characterization of former coal gasification plant sites, with J. Palmer, W. Scarlett, and Fredric Snider, Second Conference on Municipal, Hazardous, and Coal Wastes Management, Miami, December, 1983.

Management of hazardous chemical waste sites, with N.R. Tilford, 27th Annual Meeting of Association of Engineering Geologists, Boston, MA. 1984.

Verified for accuracy by: Zubair A Saleem Date: 3/12/85

BOOKS EDITED

Advances in Groundwater Hydrology, American Water Resources Assoc. Washington, D.C., p. 333, 1977.

A Decade of Progress in Water Resources, American Water Resouces Assoc. Washington, D.C., with S.C. Csallany and W.J. Roberts, 1975.

Geological Disposal of High-Level Radioactive Wastes, Assoc. of Engineering Geologists, with N.R. Tilford, 1981.

PROFESSIONAL ACTIVITIES

Chairman, Technical Program Committee, International Association of Engineering Geology (IAEG) Symposium on Management of Hazardous Chemical Waste Sites, cosponsored by the Amer. Society of Civil Engineers, Amer. Geophysical Union, and U.S. Environmental Protection Agency, October 9-10, 1985.

Co-chairman, Symposium on "Geological Licensing Topics in High and Low-Level Radioactive Waste Management," sponsored by the Geological Society of Amer. 1983.

General Chairman, 12th Annual American Water Resources Conference, Chicago, Illinois, 1976.

Chairman, Symposium on "Advances in groundwater Hydrology," sponsored by American Water Resources Association, in cooperation with the American Society of Civil Engineers, International Water Resources Association (IWRA) and U.S. Geological Survey, held in Chicago, Illinois, 1976.

Editorial Board, Water Resources Bulletin, 1978-1981.

AWARDS, HONORS, PROFESSIONAL AFFILIATIONS, AND CERTIFICATIONS

Fulbright Fellowship; Distinguished Service Award, American Water Resources Association; Service Award, Association of Engineering Geologists; and the University of Illinois Fellowship.

American Geophysical Union; American Institute of Hydrology; American Society of Civil Engineers; American Water Resources Association; Association of Engineering Geologists; International Water Resources Association; National Water Well Association; International Association of Engineering Geology.

Registered Professional Hydrogeologist (AIH).

Registered Professional Geologist in states of Delaware and Indiana.

Professional Listings - American Men and Women of Science
Leaders in American Science.

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EDWARD F. TOKARSKI

EDUCATION

University of Pennsylvania: B.A., Environmental Science and Biology (1979)
George Washington University: Graduate Level Courses towards M.A., Geology.

EXPERIENCE

Edward F. Tokarski is a Project Environmental Scientist with over six years experience conducting a wide variety of hazardous waste management projects. His experience ranges from conducting and managing complex, multi-media field investigations to providing technical support during implementation of regulatory programs. He has a thorough understanding of site investigation procedures, having participated in RI/FS studies under EPA's Superfund programs, and having conducted and managed site investigations under the Department of Defense's Installation Restoration Program for the U.S. Air Force, Army, and Navy. He presently is managing a $350,000 IRP Phase II study of ten waste sites located on an Air Force base. He has developed site cleanup plans and has participated in research and development studies of waste site remediation technologies, and so is, therefore, familiar with applying data and developing remedial actions. He also is familiar with the RCRA regulations governing hazardous waste management and currently is reviewing RCRA Part B Permit Applications for completeness and technical accuracy. He used knowledge gained conducting "hands-on" studies when he wrote sections of EPA Technical Guidance Manuals on slurry wall construction and leachate plume management. Mr. Tokarski has demonstrated his abilities by successfully completing the highly complex technical activities associated with hazardous waste site investigations and feasibility studies.

Mr. Tokarski has conducted IRP projects for the Air Force, Army and Navy. He is managing a $350,000 study at a U.S. Air Force base to confirm and characterize environmental contamination at ten waste sites. In addition to overall project management, he is responsible for technical aspects of the investigations and has evaluated background data, developed investigation approaches, led field teams during monitoring well drilling and sampling, evaluated data, and developed plans and schedules for additional activities. During a Phase 2-Systems Development Study for the U.S. Army, he was Team Leader and was responsible for scoping, planning, and carrying out the sampling of sediments contaminated with TNT and RDX. He also participated in Phase I Initial Assessment and Phase II Confirmation Studies at a Naval installation, during which he supervised the installation of 24 monitoring wells, collected surface and groundwater samples, assisted in the excavation of a suspected waste pile, evaluated collected data, and helped prepare the report concerning site hydrogeology and groundwater quality. This experience has given Mr. Tokarski a working knowledge of the IRP programs for all three services (the Navy has responsibility for USMC projects).

Mr. Tokarski has experience with RI/FS studies carried out under EPA Superfund and similar programs. He served as a field supervisor during the installation of groundwater monitoring wells surrounding Love Canal and was responsible for proper well installation, soil/rock sample collection,

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preliminary groundwater quality monitoring, and on-site health and safety. Mr. Tokarski assessed the hazard posed by the effects of acidic water on clay soils at a Superfund site, developed preliminary remedial alternatives and costs, and wrote sections of the final report. He assisted a county government by evaluating data and developing a monitoring plan for a hazardous materials landfill that was the subject of intense public opposition, and by presenting findings at public meetings and developing recommendations. He managed a project to assess 23 waste sites to establish priorities for additional remedial work, during which assessment reports were developed for each site and selected sites were evaluated using the CERCLA Hazard Ranking System. He was a member of an SAIC team that took core samples through an asphalt cap at an NPL site and susequently evaluated cap effectiveness. He currently is a Task Manager for a large RI/FS being conducted at a privately-owned landfill. The project is being performed under a consent order issued by a state environmental protection department. Mr. Tokarski's Superfund related experience shows that he is able to successfully complete RI/FS projects for EPA, state, and private clients.

Mr. Tokarski has participated in many projects for EPA's Office of Research and Development during which he applied his site investigation and remediation experience. He prepared chapters on contaminant movement in groundwater and plume detection and delineation as part of a comprehesive document on the management of leachate plumes. He developed sections concerning costing and associated remedial measures for a technical handbook concerning slurry cutoff wall use at waste sites (EPA-540/2-84-001). He prepared a short feasibility paper on the technical, legal, and political issues associated with transport and ocean dumping of large quantities of soil contaminated with low levels of dioxins and PCBs. Mr. Tokarski led field teams collecting samples from leachate collection systems at state-of-the-art landfills in order to identify waste-leachate production characteristics. Recently, he reviewed and evaluated data and wrote sections of the technical report discussing SAIC's post-implementation monitoring of remedial actions at the Lipari landfill. These and other R&D tasks completed by Mr. Tokarski have provided him with an understanding of state-of-the-art techniques for investigating and cleaning-up hazardous waste sites.

In addition to his site investigation and remedial action activities, Mr. Tokarski has substantial experience in working with the RCRA Subtitle C regulations concerning hazardous waste management. He analyzed regulations and supporting background information prior to industry comment. Mr. Tokarski has helped brief SAIC staff on the RCRA requirements prior to inspections, and has modified existing site inspection checklists to make them more useful to field personnel. He also has evaluated the regulatory requirements and implications associated with site investigation activities. Mr. Tokarski is currently assisting EPA's regulatory efforts by conducting completeness and accuracy checks on RCRA Part B Permit Applications. He has evaluated applications for incinerators, land treatment sites, surface impoundments, landfills, and storage areas, and is familiar with the RCRA regulatory requirements and the permitting process.

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In successfully completing these and other tasks, Mr. Tokarski has demonstrated his technical knowledge of site investigation procedures including: site identification, sampling and analysis, well installation, documentation and chain-of-custody, health and safety, contaminant transport, and hydrogeologic assessment. This experience also proves his ability to develop remedial alternatives, conduct regulatory analysis, apply technical expertise in developing guidance manuals, and work on politicaily sensitive projects. The success of the projects Mr. Tokarski has managed demonstrates his ability to realistically scope out a project and appropriately manage technical staff.

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1. Repa, E., McNicholas, E., Tokarski, E., and Harris, J. The Establishment of Guidelines for Modeling Groundwater Contamination from Hazardous Waste Facilities - Groundwater Models Profile. Prepared for USEPA Office of Solid Waste. July 1982.

2. Tokarski, E., Spooner, P., and Farmer, G.T. Hydrogeologic Investigation of the Naval Air Development Center Waste Disposal Sites, Warminster, PA. Prepared for the Naval Air Development Center, Warminster, PA 18974. March 1983.

3. Wagner, K., and Tokarski, E., Feasibility of Barge Transport and Ocean Disposal of Dioxin Contaminated Soils. Prepared for USEPA Municipal Environmental Research Laboratory. Cincinnati, Ohio, November, 1983.

4. Spooner, P., Wetzel, R., Spooner, C., Furman, C., Tokarski, E. and Hunt, G., Slurry Trench Construction for Pollution Migration Control. EPA-540/2-84-001, USEPA - Municipal Environmental Research Laboratory. Cincinnati, OH. February 1984.

5. Repa, E., Tokarski, E., Eades, R. Evaluation of the Asphalt Cover at the Western Processing, Inc. Superfund Site. Prepared for USEPA Office of Solid Waste. September 1984.

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APPENDIX M: References

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