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# INSTALLATION RESTORATION PROGRAM
# PHASE II
# CONFIRMATION/QUANTIFICATION
# STAGE 1

## REESE AIR FORCE BASE
## LUBBOCK, TEXAS

**Prepared by:**

**ECOLOGY AND ENVIRONMENT, INC.**
**Buffalo Corporate Center**
**368 Pleasantview Drive, Lancaster, New York 14086**

**April 1988**

## FINAL REPORT
**(May 1986 to April 1988)**

## VOLUME II: APPENDICES

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**Prepared for:**

**UNITED STATES AIR FORCE**
**Headquarters Air Training Command**
**Bioenvironmental Engineering**
**HQ ATC/SGPB**
**Randolph AFB, Texas 78150-5001**

**UNITED STATES AIR FORCE**
**Occupational and Environmental Health Laboratory**
**(USAFOEHL)**
**Technical Services Division (TS)**
**Brooks Air Force Base, Texas 78235-5501**

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# CONFIRMATION/QUANTIFICATION
# STAGE 1

FINAL REPORT
FOR
REESE AIR FORCE BASE
LUBBOCK, TEXAS

UNITED STATES AIR FORCE
HEADQUARTERS AIR TRAINING COMMAND
BIOENVIRONMENTAL ENGINEERING
(HQ ATC/SGPB)
RANDOLPH AFB, TEXAS 78150-5001

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DISTRIBUTION IS UNLIMITED

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# APPENDIX A

## GLOSSARY OF TERMS

AAF: Army Air Field

ABG: Air Base Group

ACFT MAINT: Aircraft Maintenance.

AF: Air Force.

AFB: Air Force Base.

AFESC: Air Force Engineering and Services Center.

AFFF: Aqueous Film Forming Foam.

AFR: Air Force Regulation.

ALLUVIUM: Materials eroded, transported and deposited by streams.

ALLUVIAL FAN: A fan-shaped deposit formed by a stream either where it issues from a narrow mountain valley into a plain or broad valley, or where a tributary stream joins a main stream.

ANTICLINE: A fold in which layered strata are inclined down and away from the axes.

AQUAZENE: An algicide.

ARTESIAN: Groundwater contained under hydrostatic pressure.

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

AROMATIC: Description of organic chemical compounds in which the carbon atoms are arranged into a ring with special electron stability associated. Aromatic compounds are often more reactive than non-aromatics.

ATC: Air Training Command.

AVGAS: Aviation Gasoline.

BEE: Bioenvironmental Engineer.

BES: Bioenvironmental Engineering Services

BIOACCUMULATE: Tendency of elements or compounds to accumulate or build up in the tissues of living organisms when they are exposed to these elements in their environments, e.g., heavy metals.

BIODEGRADABLE: The characteristics of a substance to be broken down from complex to simple compounds by microorganisms.

BX: Base Exchange.

CALICHE: A secondary accumulation of opaque, reddish brown to white calcareous material occurring in layers near the surface of stony soils in the arid and semi-arid regions of southwestern United States.

CE: Civil Engineering.

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act.

CES: Civil Engineering Squadron.

CIRCA: About; used to indicate an approximate date.

CLOSURE: The completion of a set of rigidly defined functions for a hazardous waste facility no longer in operation.

COD: Chemical Oxygen Demand, a measure of the amount of oxygen required to oxidize organic and oxidizable inorganic compounds in water.

COE: Corps of Engineers.

CONFINED AQUIFER: An aquifer bounded above and below by impermeable strata or by geologic units of distinctly lower permeability than that of the aquifer itself.

CONFINING UNIT: A geologic unit with low permeability which restricts the movement of groundwater.

CONTAMINATION: The degradation of natural water quality to the extent that its usefulness is impaired; there is no implication of any specific limits since the degree of permissible contamination depends upon the intended end use or uses of the water.

Cr: Chemical symbol for chromium.

CS: Communications Squadron.

DCM: Deputy Commander for Maintenance.

DCO: Deputy Commander for Operations.

DCRM: Deputy Commander for Resource Management.

DEQPPM: Defense Environmental Quality Program Policy Memorandum

DET: Detachment.

DIP: The angle at which a stratum is inclined from the horizontal.

DISPOSAL FACILITY: A facility or part of a facility at which hazardous waste is intentionally placed into or on land or water, and at which waste will remain after closure.

DISPOSAL OF HAZARDOUS WASTE: The discharge, deposit, injection, dumping, spilling, or placing of any hazardous waste into or on land or water so that such waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwater.

DoD: Department of Defense.

DOT: Department of Transportation

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

DRMO: Defense Reutilization and Marketing Office.

DUMP: An uncovered land disposal site where solid and/or liquid wastes are deposited with little or no regard for pollution control or aesthetics; dumps are susceptible to open burning and are exposed to the elements, disease vectors and scavengers.

E & E: Ecology and Environment, Inc.

EFFLUENT: A liquid waste discharge from a manufacturing or treatment process, in its natural state, or partially or completely treated, that discharges into the environment.

EOD: Explosive ordnance disposal.

EP: Extraction Procedure, the EPA's standard laboratory procedure for leachate generation.

EPA: U.S. Environmental Protection Agency.

EPHEMERAL AQUIFER: A water-bearing zone typically located near the surface which normally contains water seasonally.

EROSION: The wearing away of land surface by wind, water, or chemical processes.

ETHYLENE GLYCOL: A liquid used for de-icing aircraft; it bioaccumulates and can exhibit toxic properties.

FAA: Federal Aviation Administration.

FACILITY: Any land and appurtenances thereon and thereto used for the treatment, storage and/or disposal of hazardous wastes.

FAULT: A fracture in rock along which the adjacent rock surfaces are differentially displace.

FLOODPLAIN: The lowland and relatively flat areas adjoining inland and coastal areas of the mainland and off-shore islands, including, at a minimum, areas subject to a one percent or greater chance of flooding in any given year.

FLOW PATH: The direction or movement of groundwater as governed principally by the hydraulic gradient.

FPTA: Fire Protection Training Area.

FTW: Flying Training Wing.

FY: Fiscal Year.

GC/MS: Gas chromatograph/mass spectrophotometer, a laboratory procedure for identifying unknown organic compounds.

GROUNDWATER: Water beneath the land surface in the saturated zone that is under atmospheric or artesian pressure.

GROUNDWATER RESERVOIR: The earth materials and the interstitial open spaces that contain groundwater.

HALON: A fluorocarbon fire extinguishing compound.

HALOGEN: The class of chemical elements including fluorine, chlorine, bromine, and iodine.

HARDFILL: Disposal sites receiving construction debris, wood, miscellaneous spoil material.

HARM: Hazard Assessment Rating Methodology.

HAZARDOUS SUBSTANCE: Under CERCLA, the definition of hazardous substance includes:

1. All substances regulated under Paragraphs 311 and 307 of the Clean Water Act (except oil);

2. All substances regulated under Paragraph 3001 of the Solid Waste Disposal Act;

3. All substances regulated under Paragraph 112 of the Clean Air Act;

4. All substances which the Administrator of EPA has acted against under Paragraph 7 of the Toxic Substance Control Act;

5. Additional substances designated under Paragraph 102 of the Superfund bill.

HAZARDOUS WASTE: As defined in RCRA, a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

HAZARDOUS WASTE GENERATION: The act or process of producing a hazardous waste.

HEAVY METALS: Metallic elements, including the transition series, which include many elements required for plant and animal nutrition in trace concentrations but which become toxic at higher concentrations.

HNU Photoionizer - Field instrument used to determine the total concentration of organic and inorganic vapors and gases with an ionization potential of less than 11.7 ev. The instrument does not respond to methane or hydrogen cyanide.

HQ: Headquarters.

HWAP: Hazardous Waste Accumulation Point

HWMF: Hazardous Waste Management Facility.

HYDROCARBONS: Organic chemical compounds composed of hydrogen and carbon atoms chemically bonded. Hydrocarbons may be straight chain, cyclic, branched chain, aromatic, or polycyclic, depending upon arrangement of carbon atoms. Halogenated hydrocarbons are hydrocarbons in which one or more hydrogen atoms has been replaced by a halogen atom.

INCOMPATIBLE WASTE: A waste unsuitable for commingling with another waste or material because the commingling might result in generation of extreme heat or pressure, explosion or violent reaction, fire, formation of substances which are shock sensitive, friction sensitive, or otherwise have the potential for reacting violently, formation of toxic chemicals due to heat generation in such a manner that the likelihood of contamination of groundwater or escape of the substance into the environment is increased, any other reaction which might result in not meeting the air, human health, and environmental standards.

ILS: Instrument Landing System

INFILTRATION: The movement of water throught the soil surface into the ground.

IRP: Installation Restoration Program.

ISOPACH: Graphic presentation of geologic data, including lines of equal unit thickness that may be based on confirmed (drill hole) data or indirect geophysical measurement.

ISOPROPYL ALCOHOL: Flammable liquid used for cleaning small parts.

JP-4: Jet Propulsion Fuel No. 4, military jet fuel.

LCF: Launch Control Facility.

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.

LENTICULAR: A bed or rock stratum or body that is lens-shaped.

LINER: A continuous layer of natural or man-made materials beneath or on the sides of a surface impoundment, landfill, or landfill cell which restricts the downward or lateral escape of hazardous waste, hazardous waste constituents or leachate.

LITHOLOGY: The description of the physical character of a rock.

LOESS: An essentially unconsolidated unstratified calcareous silt; commonly homogeneous, permeable and buff to gray in color.

LYSIMETER: A vacuum operated sampling device used for extracting pore water samples at various depths within the unsaturated zone.

MEK: Methyl ethyl ketone.

METALS: See "Heavy Metals."

MGD: Million gallons per day.

MOA: Military Operating Area.

MIBK: Methyl isobutyl ketone.

MOGAS: Motor gasoline.

MONITORING WELL: A well used to measure groundwater levels and to obtain samples.

MSL: Mean Sea Level.

MWR: Morale Welfare and Recreation.

NCO: Non-commissioned Officer.

NCOIC: Non-commissioned Officer In-Charge.

NDI: Non-destructive inspection.

NET PRECIPITATION: The amount of annual precipitation minus annual evaporation.

NGVD: National Geodetic Vertical Datum of 1929.

NPDES: National Pollutant Discharge Elimination System.

OEHL: Occupational and Environmental Health Laboratory.

OIC: Officer-In-Charge.

OMS: Organizational Maintenance Squadron.

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

Pb: Chemical symbol for lead.

PCB: Polychlorinated biphenyl; liquids used as a dielectrics in electrical equipment.

PERCOLATION: Movement of moisture by gravity or hydrostatic pressure through interstices of unsaturated rock or soil.

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

PERSISTENCE: As applied to chemicals, those which are very stable and remain in the environment in their original form for an extended period of time.

PD-680: Cleaning solvent.

pH: Negative logarithm of hydrogen ion concentration.

PL: Public Law.

POL: Petroleum, oils and lubricants.

POLLUTANT: Any introduced gas, liquid or solid that makes a resource unfit for a specific purpose.

POLYCYCLIC COMPOUND: All compounds in which carbon atoms are arranged into two or more rings, usually aromatic in nature.

POTASSIUM HYDROXIDE: Corrosive material, usually liquid, used for cleaning purposes.

POTENTIOMETRIC SURFACE: The surface to which water in an aquifer would rise in tightly cased wells open only to the aquifer.

PPB: Parts per billion by weight.

PPM: Parts per million by weight.

PRAMITOL: Herbicide.

PRECIPITATION: Rainfall.

PURPLE K: A bicarbonate-based fire extinguishing agent.

QUATERNARY MATERIALS: The second period of the Cenozoic geologic era, following the Tertiary, and including the last 2-3 million years.

RCRA: Resource Conservation and Recovery Act.

RECEPTORS: The potential impact group or resource for a waste contamination source.

RECHARGE AREA: A surface area in which surface water or precipitation percolates through the unsaturated zone and eventually reaches the zone of saturation. Recharge areas may be natural or man-made.

RECHARGE: The addition of water to the groundwater system by natural or artificial processes.

SANITARY LANDFILL: A land disposal site using an engineered method of disposing solid wastes on land in a way that minimizes environmental hazards.

SATURATED ZONE: That part of the earth's crust in which all voids are filled with water.

SATAF: Site Activation Task Force.

SAX'S TOXICITY: A rating method for evaluating the toxicity of chemical materials.

SCS: U.S. Department of Agriculture Soil Conservation Service.

SEISMICITY: Pertaining to earthquakes or earth vibrations.

SODIUM CHROMATE: Liquid used in refrigeration/air conditioning machines, contains toxic chromium.

SOLID WASTE: Any garbage, refuse, or sludge from a waste treatment plant, water supply treatment, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, or agricultural operations and from community activities, but does not include solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows; industrial discharges which are point source subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 USC 880); or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954 (68 USC 923).

SPG: Security Police Group.

SPILL: Any unplanned release or discharge of a hazardous waste onto or into the air, land, or water.

SPS: Security Police Squadron.

STORAGE OF HAZARDOUS WASTE: Containment, either on a temporary basis or for a longer period, in such a manner as not to constitute disposal of such hazardous waste.

STP: Sewage Treatment Plant.

SUPS: Supply Squadron.

SVS: Services Squadron.

TCE: Trichloroethylene.

TDS: Total Dissolved Solids, a water quality parameter.

TOC: Total Organic Carbon.

TOXICITY: The ability of a material to produce injury of disease upon exposure, ingestion, inhalation, or assimilation by a living organism.

TRANSMISSIVITY: The rate at which water is transmitted through a unit width of aquifer under a unit hydraulic gradient.

TREATMENT OF HAZARDOUS WASTE: Any method, technique, or process including neutralization designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize the waste or so as to render the waste nonhazardous.

TRNS: Transportation Squadron.

TSD: Treatment, storage or disposal.

TSDF: Treatment, storage or disposal facility.

TVOR: Tactical Very-high-frequency Omnidirectional Range, a ground-based radio transmitter for aircraft navigation.

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

UREA: Solid, toxic in high doses, used as a combination ground de-icer and fertilizer.

USAF: United States Air Force.

USDA: United States Department of Agriculture.

USFWS: United States Fish and Wildlife Service.

USGS: United States Geological Survey.

WATER TABLE: Surface of a body of unconfined groundwater at which the pressure is equal to that of the atmosphere.

WWTP: Wastewater Treatment Plant.

# APPENDIX B

## CONTRACT DESCRIPTION OF WORK

INSTALLATION RESTORATION PROGRAM (IRP)

PHASE II - CONFIRMATION/QUANTIFICATION (STAGE 1)

REESE AFB, TEXAS

## I. DESCRIPTION OF WORK

The overall objective of the Phase II investigation is to define the magnitude, extent, direction and rate of movement of identified contaminants. A series of staged field investigations may be required to meet this objective. The contractor shall recommend any additional investigations required beyond this stage (Stage 1), including an estimate of costs.

The purpose of this task is to undertake a field investigation at Reese AFB TX: (1) to determine the presence or absence of contamination within the specified areas of investigation; (2) if possible, determine the magnitude of contamination and the potential for migration of those contaminants in the various environmental media; and (3) identify significant public health and environmental hazards of migrating pollutants based on State or Federal standards for those contaminants.

The Phase I IRP Report (mailed under separate cover) incorporates the background and description of the sites/zones for this task. To accomplish this survey effort, the contractor shall take the following actions:

### A. GENERAL

1. The contractor shall monitor the ambient air above all exploratory well drilling and borehole operations with a photoionization meter or equivalent organic vapor detection device to identify potential generation of air pollutants, hazardous and/or toxic materials harmful to personnel or the environment. The results of these tests shall be included in boring logs. In addition, the contractor shall monitor drill cuttings for discoloration and odor. During drilling operations, if soil cuttings are suspected to be hazardous at a sampling location, the contractor shall containerize them in new, unused drums and test them for EP Toxicity and Ignitability. The results of these observations shall also be included in boring logs. In addition, one sample shall be collected from each of the other sampling locations not suspected to have hazardous cuttings and tested for EP Toxicity and Ignitability. A maximum of 35 samples shall be collected for EP Toxicity and Ignitability. At these locations all drill cuttings shall be accumulated on impermeable plastic tarpaulin sheets and covered with the same material. If the EP Toxicity results are positive, drill cuttings shall be containerized and turned over to the Base Civil Engineer. If the EP Toxicity results are negative the drill cuttings shall be disposed of in an area on base designated by the Base Civil Engineer. In addition, the contractor shall comply with all applicable EPA, AFOSH, OSHA, State and any other agencies' regulations/procedures concerning safety during drilling, sampling, and analysis procedures. If required, a safety plan shall be filed directly with these agencies.

2. All water samples collected shall be analyzed on site by the contractor for pH, temperature, and specific conductance. Sampling, maximum holding time, and preservation of samples shall strictly comply with the following references: Standard Methods for the Examination of Water and Wastewater, 16th Ed. (1985), pp. 39-44; ASTM, Section 11, Water and Environmental Technology; Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82-057; and Methods for Chemical Analysis of Waters and Wastes, EPA Manual 600/4-79-020, pp. xiii to xix (1983). All chemical analyses (water and soil) shall meet the required limits of detection for the applicable EPA method identified in Attachment 1.

3. Locations where surface or sediment samples are taken or where soil exploratory borings are drilled shall be marked, where feasible, with a permanent marker; and the location marked on a project map showing all sites on Reese AFB.

4. Field data collected for each site shall be plotted and mapped. The nature, magnitude, and potential for contaminant flow within each zone to receiving streams and groundwaters shall be estimated. Upon completion of the sampling and analysis, the data shall be tabulated in the next R&D Status Report as specified in Sequence No. 1, Item VI below.

5. Determine the areal extent of the sites by reviewing available aerial photos of the base, both historical and the most recent panchromatic and infrared. Remote sensing photos may be acquired from the base; USDA Agricultural Stabilization and Conservation Service's Aerial Photography Division at 2505 Parleys Way, Salt Lake City UT 84109; EROS Data Center, Sioux Falls SD 57198; or USGS National Cartographic Information Center, Mail Stop 507, National Center, Reston VA 22092.

6. Split all water and soil samples. One set of samples shall be analyzed by the contractor and the other set of samples shall be delivered immediately (the same collection day) to the field government point of contact (POC). The field POC will select 10% of the split samples for subsequent shipment and analysis and deliver them to the contractor within 24 hours of receipt. The contractor shall supply all packing and shipping materials for the field POC's use in packaging the split samples. The contractor shall accept from the field POC the packaged samples for immediate shipment (within 24 hours) for analysis through overnight delivery to:

USAFOEHL/SA
Bldg 140
Brooks AFB TX 78235-5501

a. The samples sent to the USAFOEHL/SA shall be accompanied by the following information:

(1) Date and time collected

(2) Purpose of sample (analytes and sample group)

(3) Installation name (base)

(4) Sample number (on container)

(5) Source/location of sample

(6) Contract task numbers and title of project

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

(8) Volumes removed before sample taken

(9) Special conditions (use of surrogate standard special nonstandard preservations, etc.)

(10) Preservatives used

(11) Collector's name or initials

b. Forward this information with each sample by properly completing an AF Form 2752A "Environmental Sampling Data" and/or AF Form 2752B "Environmental Sampling Data - Trace Organics", working copies of which have been provided you under separate cover. Each sample container shall be labeled to reflect the data in (1), (2), (3), (4), (10) and (11) above. In addition, copies of field logs documenting samples collected during this survey should accompany the samples.

c. Maintain complete and legible chain-of-custody records for all samples, field blanks, and quality control samples.

7. Analyze an additional 10% of all samples, for each parameter, for quality control purposes, as indicated in Attachment 1. Include all quality control procedures and data in draft and final reports.

8. For groundwater monitoring wells, comply with the USEPA Publication 330/9-S1-002, NEIC Manual for Groundwater/Subsurface Investigators at Hazardous Waste Sites for monitoring well installation. Use only screw type joints; no solvent glue can be used.

9. Wells shall be of sufficient depth to collect samples representative of aquifer quality and to intercept contaminants if they are present. Well development shall proceed until the discharge water is clear and free of sediment to the fullest extent possible. Well development procedures shall be fully documented in the Technical Report. As a precautionary measure all well installation/development fluids shall be containerized until analyses have shown a nonhazardous condition. If fluids are nonhazardous they shall be discharged to the nearest storm sewer, sanitary sewer or to grade based on guidance from the Base Civil Engineer. If fluids are hazardous they shall be turned over to the Base Civil Engineer in new 55-gallon drums.

10. Survey elevations of all newly installed monitoring wells and soil borings with respect to a USGS bench mark on or near base to an accuracy of 0.01 feet. Horizontally locate the new wells to an accuracy of 1 foot and record on site maps.

11. Measure water levels at all monitoring wells as feet below the ground surface or below the top of casing elevation to the nearest 0.01 feet. Report in terms of mean sea level (MSL). Measure static water levels in wells prior to sampling and at time of well development.

12. The exact location and number of monitoring wells, borings, and augerings for each site shall be determined in the field by the contractor in consultation with the base point of contact (POC) and the USAFOEHL program manager. The approximate locations and recommended number and depth of wells (including screening lengths), borings and augerings for sites under investigation are given in the site specific section of the task. Monitor wells and borings at all landfill sites shall be drilled around the perimeter and outside of the landfill areas unless the geophysical survey indicates there are no safety problems or buried drums.

13. Drill all monitoring wells using the following specifications:

a. Drill all wells that are less than 100 feet deep using hollow-stem auger equipment. With the hollow-stem auger method, a center stem, plug, and bit attached to the center stem may be inserted into the auger for use while drilling. This will prevent material from entering into the hollow-stem of the auger. Drill all wells that are equal to or more than 100 feet deep using mud/air rotary techniques. If a drilling fluid is required, the contractor shall use water from an operational well on base as specified by the Base Civil Engineer. Drilling fluid additives will not be used to insure that their components will not interfere with the chemical analyses to be performed on the samples. There are sufficient natural clays in the strata to be drilled to assure borehole integrity. Take samples for stratigraphic control purposes at 5-foot intervals and log them. Include pilot boring log and well completion summaries in the Technical Report (as specified in Item VI below).

b. Total footage of all borings and wells in this task shall not exceed 1485 linear feet. Drill a maximum of four (4) wells. Maximum depth of each well shall not exceed 175 linear feet or to a depth necessary to fully penetrate the Ogallala Formation by drilling to the "blue clay" marker bed indicating the aquifer base. (Added information on formation marker beds provided under separate cover). Construct each well with 4-inch, Schedule 80 PVC casing using threaded, nonglued fittings. The borehole of these 4-inch ID (inside diameter) monitoring well shall be ten (10) inches diameter. Screen each well to a minimum of eight feet below the water-table surface, or below the top of the unconfined aquifer, as it is encountered during drilling. Total screen for all wells in this task shall not exceed 140 linear feet. The screen shall consist of 4-inch diameter PVC. Cap the screen at the bottom. All connections shall be flush-joint threaded. Prior to well completion, flush all boreholes constructed with mud rotary technique by using clean water. Centralizers shall be used to assure the plumb of these wells.

Gravel-pack each well with washed and bagged rounded sand or gravel with a grain size distribution compatible with the screen and formation. For monitoring wells, the screen slot opening shall be 0.010 or 0.020 inches. Place the pack from the bottom of the borehole to ten (10) feet above the top of the screen. Granulated or pelletized bentonite shall be tremied above the sand/gravel pack to a minimum thickness of five (5) feet. Place Type I Portland cement and bentonite grout from above the top of the bentonite seal to the land surface using tremie pipe with pressure grouting. Complete each well with the installation of a locking cap and clearly number the well with exterior paint. Locks shall be provided by the contractor for each well and a master key shall be delivered to the Air Force POC. Protective guard posts (cement-filled) may be required for wells in areas where moving equipment such as a tractor and riding lawn mower is operated. If well stick-up is of concern in an area (e.g., golf course, taxiway, access roads, etc.), complete the well flush with the land surface. Coordinate well completion method (stick-up vs flush) with USAFOEHL program manager and base POC. In all cases each well will be completed with a 2-foot by 2-foot Type I Portland cement collar around the well casing. This collar shall be ten (10) inches in thickness with approximately six (6) inches buried. The contractor shall take whatever measures necessary to prevent surface runoff from entering into any ground-flushed well.

14. Develop each well with a submersible pump, bailer, high velocity jet, surge block, and/or airlift method until the water is clear of suspended solids. If mud is used during drilling, polyphosphate dispersing agents may be used to help with mud removal.

15. Purge wells prior to sampling. Purging will be complete when three well or bore volumes of water have been displaced or until the pH, temperature, specific conductance, color, and odor of the discharge is stabilized. Conduct purging operation using a submersible pump. Conduct all sampling using a Teflon bailer. Purging techniques will be fully documented in the Technical Report. As the first step of groundwater sampling operations at each well, take water level measurements to the nearest 0.01 foot with respect to an established surveyed mark-point on top of the well casing.

16. Decontamination Procedures

a. All sampling equiment, including components of sampling interface, shall be decontaminated prior to use between samples, and between sampling locations to avoid cross-contamination. Sampling equipment and interface shall be thoroughly washed with a laboratory-grade detergent followed by clean water, solvent (methanol), and distilled water rinses. Sufficient time shall be allowed for the solvent to evaporate and for the equipment to dry completely. The monofilament line or steel wire used to lower bailers into the well shall be dedicated to each well or discarded after each use. The calibrated water level indicator for measuring well volume and product elevation must be decontaminated before use in each well. Water sampling shall be conducted from the background monitoring wells to the "least" contaminated and finally the "most" contaminated wells, if possible.

b. The drilling rig and tools shall receive thorough initial cleaning and be decontaminated after each borehole. As a minimum, drilling bits, Kelly bar and drill stem shall be steam cleaned after each borehole is installed. Drilling shall proceed from the "least" to the "most" contaminated areas, if possible.

17. For those methods which employ gas chromatography (GC) as the analytical technique (i.e., E601, E602, E608, E617, SW8010, SW8020, etc.) positive confirmation of identity is required for all analytes having concentrations higher than the Method Detection Limit (MDL). This positive confirmation shall be conducted by second-column GC; however, gas chromatography/mass spectroscopy (GS/MS) can be used for positive confirmation if the quantity of each analyte to be confirmed is above the detection level of the GC/MS instrument. Analytes which cannot be confirmed will be reported as "Not Detected" in the body of the report, but results of all second-column GC or GC/MS confirmational analyses are to be included in the report appendix along with other raw analytical data. Quantification of confirmed analytes will be based upon the first-column analysis. The maximum number of second-column confirmational analyses that will be funded under this task is fifty percent (50%) of actual field samples. The total number of samples for each GC method listed in Attachment 1 includes this allowance. If GC/MS, or a combination of second-column GC and GC/MS, is used, the total cost of all such analyses for a particular parameter shall not exceed the funding allowed for positive confirmation using only second-column GC.

18. Perform shallow soil augering using a hand or power auger. Perform a maximum of ten (10) shallow soil augerings. Total footage shall not exceed twenty (20) feet. Collect a maximum of two (2) soil samples from each augering (maximum of twenty (20) auger samples for chemical analyses; see also paragraph IB9).

19. The maximum depth of soil borings, excluding shallow soil augering, shall be 175 feet. Perform a maximum of 35 borings. Collect soil samples for chemical analyses at site specific intervals (see Section IB later) from the ground surface, and at depths suspected of containing waste materials, and at any major soil interface but not to exceed five (5) samples per boring for shallow boreholes (30') and seven (7) samples per boring for deep boreholes (175') (maximum of 153 borehole samples for chemical analysis). Obtain stainless steel split-spoon samples, ASTM Method D-1536. The exact location of boreholes shall be determined in the field by the contractor and approved by the base POC and the USAFOEHL Program Manager.

20. Upon completion of operations at each boring, grout the borehole from the bottom of the hole to the land surface in order to prevent cross-aquifer contamination.

21. Whenever possible, measure water levels in all boreholes after the water level has stabilized and if not possible document why.

22. Conduct a literature search to complement the Phase I Report (mailed under separate cover) for local hydrogeologic conditions. Data generated in this literature search shall complement Phase I Report data such

that the following list will be complete. This list of data shall be utilized by the contractor to pinpoint well locations, sampling points, etc. In addition, this data shall be included in Appendix D of the Technical Report of this effort.

a. Topographic data

b. Geologic data

(1) Structure

(2) Stratigraphy

(3) Lithology

c. Hydrologic data

(1) Location of existing wells, observation holes and springs within a 1-mile radius of sites to be investigated

(2) Groundwater table and potentiometric contours

(3) Depth to water

(4) Quality of water

(5) Recharge, discharge, and contributing areas

d. Data on existing wells, observation holes, and springs within a 1-mile radius of sites to be investigated

(1) Location, depth, diameter, type of wells, and logs

(2) Static and pumping water level, hydrographs, yield, specific capacity, quality of water

(3) Present and projected groundwater development and use

(4) Corrosion, incrustation, well interference, and similar operation and maintenance problems

(5) Location, type, geologic setting, and hydrographs of springs

(6) Observations well networks

(7) Existing water sampling sites

(8) Summary of analysis of water quality data from these wells, observation holes and/or springs

e. Aquifer data

(1) Type, such as unconfined, artesian, or perched

(2) Thickness, depths, and formational designation

(3) Boundaries

(4) Transmissivity, storativity, and permeability

(5) Specific retention

(6) Discharge and recharge

(7) Ground and surface water relationship

(8) Aquifer models

f. Climatic data

(1) Precipitation

(2) Evapotranspiration

23. All well drilling, development, purging, and sampling methods must conform to State and other applicable regulatory agencies' requirements. Include in the Appendix the names of all approving regulatory personnel and dates that they accepted drilling techniques, well development, purging, and sampling methods.

24. All chemical/physical analyses shall conform to State and other applicable federal and local regulatory agencies' legal requirements. If laboratory certification by any regulatory agency is required for any analyses, they shall be conducted in a certified laboratory.

25. In addition to all analyses results, summarize sampling methods used, detection levels, and holding times in a table included in the Appendix.

26. Include second column confirmation results in the report. These shall include what columns were used, conditions, and the two different retention times for major components.

27. Internal quality control procedures and data (lab blanks, lab spikes, and lab duplicates), as well as field quality control measures, shall be included in the draft final and final Technical Reports.

28. Include in the report an inventory of all wells on base (active and abandoned). If well is abandoned state reason, if known.

29. Determine available techniques for well abandonment that are applicable to the type of monitoring wells and geologic conditions. Consider that these wells will be abandoned at some future date after the study

objectives have been met and there is no longer a need for the wells. Recommend a candidate method(s) or technique to apply, including costs. The actual process of well abandonment is not a part of this study at this time.

30. Technical Operations Plan (TOP): Within two (2) weeks after Notice to Proceed (NTP) for the delivery order, the contractor shall develop a Technical Operations Plan based on the requirements listed herein. This plan shall be explicit with regard to field procedures. Include, but do not limit the plan to field decontamination operations, sampling protocol, QA/QC field and laboratory procedures, field schedule, etc. A guideline for the plan is provided under separate cover. Only these requirements of the Data Item Descriptions (DID), Sequence No. 20, Item VI below shall be applied.

B. SITE SPECIFICS. (See Figure 1, Attachment 2 for site location map.) In addition to items delineated in Section A above, conduct the following specific actions at the following sites:

1. Industrial Waste Lake (SI-1)

a. Install four (4) soil borings around the perimeter of the lake. Three of these are shallow borings to a depth of 30 feet. The fourth one shall be installed east-southeast of the lake between the lake and Highway Spur 309. The fourth boring shall have a maximum depth of 175 feet. Split-spoon samples shall be taken at 5-foot intervals with option to sample at changes in soil type or strata giving positive screen for volatile components, odor, and discoloration. If odor, color, and the reading of an organic vapor analyzer (or HNu meter) do not show contamination, soil samples shall be taken for screening analyses, preferably, at 3, 15, and 30 foot depths for the shallow borings, and at 3, 15, 30, and 50 foot depths, and the capillary zone immediately above the Ogallala aquifer for the deep boring. Total footage of the borings shall not exceed 290 feet. Total number of soil samples shall not exceed 22 samples.

b. Analyze these soil samples for purgeable organic compounds (SW8010 and SW8020), oil and grease (E413.2 modified for soils), phenols (SW3550, then SW8040), base/neutral/acid extractable organics (SW3550, then SW8270), organochlorine pesticides and PCBs (SW3550, then SW8080), organophosphorus pesticides (SW3550, then SW8140) and chlorinated herbicides (SW8150).

c. Convert the deep boring into a 4-inch ID (inside diameter) monitoring well. The length of the milled screen shall not exceed thirty (30) feet. Insure that majority of the screen is in contact with the water-bearing interval of the Ogallala formation.

d. Two (2) rounds of groundwater samples shall be taken from this monitoring well 30 to 45 days apart. During each round of well sampling, one (1) groundwater sample will be collected. Analyze each sample for purgeable organic compounds (E601 and E602), oil and grease (EPA 413.2), phenols (E604), total dissolved solids (TDS) (E160.1), base/neutral/acids extractable organics (E625), organochlorine pesticides and PCBs (E608), organophosphorus pesticides (SW8140), chlorinated herbicides (A509B) and primary metals (E200.7).

e. Collect one (1) lake water and four (4) sediment samples for chemical screen analyses. The sediment samples shall be collected at: (1) lake bottom, (2) the lake inlet delta area, (3) the rainwater drainage channels along Highway Spur 309 and between the picnic area and golf course, and (4) the roadside ditch discharge point southwest of golf green no. 2 at the road intersection. Collect another lake water sample for chemical screen analyses in 30 to 45 days.

f. Analyze these four (4) sediment samples for purgeable organics (SW8010 and SW8020), oil and grease (E413.2 modified for soils), phenols (SW3550, then SW8040), base/neutral/acid extractable organics (SW3550, then SW8270), organochlorine pesticides and PCBs (SW3550, then SW8080), organophosphorus pesticides (SW3550, then SW8140), and chlorinated herbicides (SW8150). Analyze the two (2) lake water samples for the parameters listed in paragraph IB1d above.

2. Sewage Lake (SI-2), including East Landfill (D-3), North Landfill (D-4), West Landfill (D-5) and Inactive Fire Training Areas (FT-3)

a. Perform a surface geophysical survey. An electromagnetic survey shall be conducted to define the perimeter of the landfills and to delineate the possibility and potential of migration of an underground contaminant plume. A proton precession magnetometer survey shall be conducted to determine the presence/absence of subsurface metal objects either in the landfills or adjacent to them where interference with drilling would occur.

b. Install four (4) soil borings between each of the surrounding sites and the lake. Three of the borings shall be 30-feet deep each, a total of 90 feet. The fourth one shall have a maximum depth of 175 feet and shall be installed near and south of Landfill D-3. Split-spoon samples shall be taken at 5-foot intervals with option to sample at changes in soil type or strata giving positive screen for volatile components, odor, and discoloration. If odor, color, and the reading of an organic vapor analyzer (or HNu meter) do not show contamination, soil samples shall be taken for screening analyses, preferably at 3, 15, and 30 foot depths for the shallow borings, and at 3, 15, 30, and 50 foot depths, and the capillary zone immediately above the Ogallala aquifer for the deep boring. Total boring length shall not exceed 290 feet, and the number of soil samples for chemical analyses shall not exceed 22 samples.

c. Analyze the soil samples for purgeable organic compounds (SW8010 and SW8020), oil and grease (E413.2 modified for soils) and phenols (SW3550, then SW8040).

d. Convert the deep borehole into a 4-inch ID monitoring well. The length of the milled screen shall not exceed thirty (30) feet. Insure that the majority of the screen is in contact with the water-bearing interval of the Ogallala formation.

e. Two (2) rounds of groundwater samples shall be taken from this monitoring well 30 to 45 days apart. During each round of well sampling, one (1) groundwater sample will be collected. Analyze each sample for purgeable

organic compounds (E601 and E602), oil and grease (E413.2), phenols (E604), TDS (E160.1), base/neutral/acids extractable organics (E625), organochlorine pesticides and PCBs (E608), organophosphorus pesticides (SW8140), chlorinated herbicides (A509B) and primary metals (E200.7).

f. Collect four (4) sediment samples from Sewage Lake as follows: (1) in the area of the sewage plant discharge point, (2) in the low flow area at the outlet of the discharge channel into the lake, and (3) at the lake bottom (two samples). A 2-foot split-spoon sampler shall be driven into the lake sediment and the top and bottom 1-foot sections shall be separated as two samples for screening analyses.

g. Analyze the eight (8) sediment samples for purgeable organic compounds (SW8010 and SW8020), oil and grease (E413.2 modified for soils), phenols (SW3550, then SW8040), base/neutral/acids extractable organics (SW3550, then SW8270), organochlorine pesticides and PCBs (SW3550, then SW8080), organophosphorus pesticides (SW3550, then SW8140) and chlorinated herbicides (SW8150).

h. Two (2) rounds of water samples shall be taken from the sewage lake 30 to 45 days apart. During each round of lake sampling, one (1) water sample will be collected at approximately the same location. Analyze each sample for purgeable organic compounds (E601 and E602), oil and grease (E413.2), phenols (E604), TDS (E160.1), base/neutral/acids extractable organics (E625), organochlorine pesticides and PCBs (E608), organophosphorus pesticides (SW8140), chlorinated herbicides (A509B), and primary metals (E200.7).

3. POL Storage Area (Aqua System) Spill Site (SP-1)

a. Perform a soil gas survey using a slambar with extension, an organic vapor analyzer (OVA), and an oxygen meter/explosimeter.

b. Install up to four (4) soil borings with a maximum depth of 30 feet, a total of 120 linear feet. The soil gas survey shall assist in determining the boring locations. Observation of odor, discoloration, and OVA reading shall be recorded on the boring logs. Split-spoon samples shall be taken at 5-foot intervals with option to sample at changes in soil type or strata giving positive screen for volatile components, odor, and discoloration. If odor, color, and the reading of an organic vapor analyzer (or HNu meter) do not show contamination, soil samples shall be taken for screening analyses, preferably at 3, 10, 15, 20, and 30 foot depths for the shallow thirty (30) foot borings. Up to a maximum of 20 soil samples shall be taken and analyzed for purgeable organics (SW8010 and SW8020), petroleum hydrocarbons (E418.1 modified for soils), oil and grease (E413.2 modified for soils), chromium (SW3050, then SW7190) and lead (SW3010, then SW7420).

4. Southwest Landfill (D-1)

a. Perform a surface geophysical survey using electromagnetic conductivity and magnetometer to delineate the buried trenches and to locate the existence or confirm the absence of buried drums.

b. Install up to four (4) soil borings with a maximum of 290 linear feet. Three of the borings shall have an average depth of 30 feet, and the deep one, tapping the Ogallala aquifer, having a maximum depth of 175 feet. Split-spoon samples shall be taken at 5-foot intervals with option to sample at changes in soil type or strata giving positive screen for volatile components, odor, and discoloration. If odor, color, and the reading of an organic vapor analyzer (or HNu meter) do not show contamination, soil samples shall be taken for screening analyses, preferably at 3, 15, and 30 foot depths for the shallow borings, and at 3, 15, 30, and 50 foot depths, and the capillary zone immediately above the Ogallala aquifer for the deep boring. The deep boring shall be located in the southeast portion of the landfill so that it can be converted to a downgradient monitoring well.

c. Analyze these soil samples for purgeable organics (SW8010 and SW8020), oil and grease (E413.2 modified for soils), organochlorine pesticides and PCBs (SW3550, then SW8080), organophosphorus pesticides (SW3550, then SW8140), chlorinated herbicides (SW8150) and primary metals (SW3050, then SW6010).

d. Convert the deep boring into a 4-inch ID monitoring well. The length of the milled screen shall not exceed thirty (30) feet. Insure that the majority of the screen is in contact with the water-bearing interval of the Ogallala formation.

e. Two (2) rounds of groundwater samples shall be taken from this monitoring well 30 to 45 days apart. During each round of well sampling, one (1) groundwater sample will be collected. Analyze each sample for purgeable organic compounds (E601 and E602), oil and grease (E413.2), phenols (E604), TDS (E160.1), base/neutrals/acids extractable organics (E625), organochlorine pesticides and PCBs (E608), organophosphorus pesticides (SW8140), chlorinated herbicides (A509B) and primary metals (E200.7).

5. Civil Engineering Paint Shop Trench (SI-4)

a. Install one (1) deep soil boring having a maximum depth of 175 feet at or near this site, and convert this boring into an Ogallala aquifer monitoring well. The length of the milled screen shall not exceed thirty (30) feet. Insure that the majority of the screen is in contact with the water-bearing interval of the Ogallala formation.

b. Split-spoon samples shall be taken at 5-foot intervals with option to sample at changes in soil type or strata giving positive screen for volatile components, odor, and discoloration. If odor, color, and the reading of an organic vapor analyzer (or HNu meter) do not show contamination soil samples shall be taken for screening analyses, preferably at 3, 15, 30, and 50 foot depths, and the capillary zone immediately above the Ogallala acquifer. The paint trench has been excavated to remove the contaminated soil. The excavated trench was then filled with clean soil. Therefore, no samples will be taken in the clean fill area for chemical analysis. Obtain chemical analyses data on excavated paint trench soil from base POC and include in analysis of site and in the final technical report. Analyze the soil samples for purgeable organics (SW8010 and SW8020), oil and grease (E413.2 modified

for soils), phenols (SW3550, then SW8040), base/neutral/acids extractable organics (SW3550, then SW8270), cadmium (SW3050, then SW7130), chromium (SW3050, then SW7190), lead (SW3050, then SW7420), nickel (SW3050, then SW7520) and zinc (SW3050, then SW7950).

c. Collect one (1) groundwater sample from this monitoring well, at two different times (30 to 45 days apart), and analyze for purgeable organics (E601 and E602), oil and grease (E413.2), phenols (E604), TDS (E160.1), base/neutrals/acids extractable organics (E625), and primary metals (E200.7).

6. Active Fire Training Area (FT-1), Including Drainage Impoundment (SI-3)

a. Install two (2) soil borings, each 30 feet deep; one located hydraulically upgradient and the other located hydraulically downgradient of the site. Split-spoon samples shall be taken at 5-foot intervals with option to sample at changes in soil or strata giving positive screen for volatile components, odor, and discoloration. If odor, color, and the reading of an organic vapor analyzer (or HNu meter) do not show contamination, soil samples shall be taken for screening analyses, preferably, at 3, 15, 20, and 30 foot depths. Analyze up to a maximum of eight (8) soil samples for purgeable organics (SW8010 and SW8020), oil and grease (E413.2 modified for soils), phenols (SW3550, then SW 8040), chromium (SW3050, then SW7190) and lead (SW3050, then SW7420).

b. Collect two (2) grab samples in the first six inches of the surface soil: one in the natural drainage path from the sump outlet and one in the area of the natural depression (playa). Analyze these two (2) samples for the parameters listed in paragraph IB6a above.

7. Northwest Landfill/Rubble Area (D-11)

a. Perform a surface geophysical survey using electromagnetic and magnetometry to determine the presence or absence of buried drums and the perimeter of the landfill.

b. Install up to four (4) shallow borings after the analysis of geophysical survey data. The depth of each borehole shall be 30 feet and the maximum length of all four (4) boreholes shall be 120 feet. Split-spoon samples shall be taken at 5-foot intervals with option to sample at changes in soil type or strata giving positive screen for volatile components, odor, and discoloration. If odor, color, and the reading of an organic vapor analyzer (or HNu meter) do not show contamination, soil samples shall be taken for screening analyses, preferably, at 3, 15, and 30 foot depths.

c. Analyze these soil samples from the four (4) boreholes for purgeable organics (SW8010 and SW8020), oil and grease (E413.2 modified for soils), and polynuclear aromatic hydrocarbons (SW3550, then SW8100).

8. Hurlwood Acquisition and Landfill (D-7)

a. Install protective casing, guard post, and lock for the five (5) inactive wells on the property. Survey and locate these wells on a map. Collect five (5) groundwater samples (one from each well) for purgeable organics (E601 and E602), oil and grease (E413.2), phenols (E604), TDS (E160.1), base/neutral/acids extractable organics (E625), and primary metals (E200.7).

b. Perform a surface geophysical survey to delineate the D-7 landfill perimeter and to detect the existence or confirm the absence of buried drums.

c. Install two (2), 30-foot soil borings in the landfill after geophysical survey. Split-spoon samples shall be taken at 5-foot intervals with option to sample at changes in soil type or strata giving positive screen for volatile components, odor, and discoloration. If odor, color, and the reading of an organic vapor analyzer (or HNu meter) do not show contamination, soil samples shall be taken for screening analyses, preferably, at 3, 15, and 30 foot depths for the shallow 30 foot borings.

d. Analyze these soil samples for purgeable organics (SW8010 and SW8020), oil and grease (E413.2 modified for soils), phenols (SW3550, then SW8040) and arsenic (SW3050, then SW7060).

9. Sewage Digester Sludge Spreading Area (between 1st and 2nd Streets) (SS-1)

Install up to ten (10) soil borings at two (2) feet depth each (total of twenty (20) linear feet) using hand or power auger. Locate these borings on a map. Collect up to a maximum of twenty (20) soil samples at 0.5 and 2 foot depths and analyze for purgeable organics (SW8010 and SW8020), oil and grease (E413.2 ,modified for soils), base/neutral/acids extractable organics (SW3550, then SW8270), arsenic (SW3050, then SW7060), cadmium (SW3050, then SW7130), chromium (SW3050, then SW7190), copper (SW3050, then SW7210), lead (SW3050, then SW 7420), nickel (SW3050, then SW7520), and zinc (SW3050, then SW7950). These two foot boreholes do not need to be pressure grouted as the 30 foot and 175 foot borings.

C. WELL AND BOREHOLE CLEANUP

Remove all well and borehole area drill cuttings after determination of their nonhazardous condition, and clear the general area following the completion of each well and borehole. Only those drill cuttings and drilling fluids suspected as hazardous waste (based on discoloration, odor, organic vapor detection instrument and/or other testing) shall be properly containerized and moved by the contractor to locations within the installation specified by the base POC or USAFOEHL program manager for government disposal. The suspected hazardous wastes shall be tested by the contractor for EP Toxicity and Ignitability. The results of these analyses will be documented in the Technical Report. The contractor is not responsible for the ultimate disposal of either the hazardous drill cuttings or the well

installation/development fluids. Disposal will be accomplished by the appropriate base offices using base resources. However, any hazardous wastes generated by borehole or well installation/development shall be containerized in new 55-gallon drums and delivered to an accumulation point on base as specified by the Base Civil Engineer.

D. HEALTH AND SAFETY

Comply with USAF, OSHA, EPA, State and local health and safety regulations regarding the proposed work effort. Use EPA guidelines for designating the appropriate levels of protection at the study sites. Prepare a written Health and Safety Plan for the proposed work and coordinate it directly with applicable regulatory agencies. Provide an information copy of the Health and Safety Plan to the USAFOEHL prior to commencing field operations (i.e., drilling and sampling).

E. DATA REVIEW

1. Tabulate field and analytical laboratory results, including field and laboratory parameters and QA/QC data, and incorporate them into the monthly R&D Status Reports. Forward them to the USAFOEHL for review as soon as they become available as specified in Item VI below. Field and laboratory parameters shall include time and dates for sample collection, extraction procedures/methods and analysis, along with the EPA/Method maximum holding times.

2. Upon completion of all analyses, tabulate and incorporate all results into an Informal Technical Information Report (Sequence 3, Item VI below) and forward the report to USAFOEHL for review.

3. Data/results, generated throughout this undertaking, indicating a possibility of health risk (e.g., contaminated drinking water aquifer) shall be reported immediately via telephone to the USAFOEHL Program Manager.

F. REPORTING

1. A draft report delineating all findings of this field investigation shall be prepared and forwarded to the USAFOEHL (Sequence 4, 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, groundwater surface and gradient maps, water quality and soil analysis results, available geohydrologic cross sections, and laboratory and field quality assurance/quality control information. The report shall follow the USAFOEHL format (mailed under separate cover). The format is an integral part of this delivery order.

2. The results section of the report shall include water and soil analyses results, field quality control sample data, internal laboratory control data (lab blanks, lab spikes, and lab duplicates), and laboratory quality assurance procedures. Provide second column confirmation results and include which columns were used, the conditions, and retention times. Summarize the specific collection techniques, analytical method, holding time,

and limit of detection for each analyte (Standard Methods, EPA, etc.). When the detection limits specified in Attachment 1 have not been met (i.e., because of interference, matrix effects, etc.), the contractor shall provide explanations for the higher detection limits.

3. The recommendation section shall address each site and list them by categories. Category I shall consist of sites where no further action (including remedial action) is required. Data for these sites are considered sufficient to rule out significant public health or environmental hazards. Category II sites are those requiring additional Phase II effort to determine the direction, magnitude, rate of movement and extent of detected contaminants. The contractor shall identify potential environmental consequences of discovered contamination, where known. Category III sites are sites that will require remedial actions (ready for IRP Phase IV actions). Recommendations for Category III sites shall include any possible influence on sites in Categories I and/or II due to their connection to the same hydrological system. Any dependency between sites in different categories shall be clearly stated. The contractor shall include a list of candidate remedial action alternatives including Long Term Monitoring (LTM) as remedial action and corresponding rationale, that, as a minimum, should be considered in selecting the remedial action for a given site. The list shall encompass alternatives that could potentially attain applicable environmental standards. For contaminants that do not have standards, the contractor may use EPA-recommended safe levels for noncarcinogens (Health Advisory or Suggested-No-Adverse-Response Levels) and target levels for carcinogens ($1 \times 10^{-}$ cancer risk level). Unless specifically requested, comprehensive cost, including cost/benefit analyses of remedial action alternatives, shall not be included. However, in those situations where field survey data indicate immediate corrective action is necessary, the contractor shall present specific, detailed recommendations. For each category above, the contractor shall summarize the results of field data, environmental or regulatory criteria, or other pertinent information supporting conclusions and recommendations.

4. The contractor shall provide cost estimates by line item for future efforts recommended for Category II sites and LTM Category III sites. These estimates shall be provided as requested in Sequence 19, Item VI below. Unless specifically requested, no cost estimate shall be submitted with draft reports. For Category II sites, develop detailed site-specific estimates using prioritized costing format (i.e., cost of conducting the required work on: the highest priority site only; the first two highest priority sites only; the first three highest priority sites only; etc., until all required work is discretely costed) for the proposed work effort which is based on the Air Force-approved priority which was recommended by the contractor. Consider the type of contaminants, their magnitude, the direction and rate of their migration, and their subsequent potential for environmental and health consequences when prioritizing sites. For Category III sites slated for long-term monitoring, develop site-specific estimates which detail the costs associated with permanent installation of monitoring wells, groundwater sampling interface, including permanent installation of pumps and



recycled paper

sampling lines and four quarterly (1 year period) sample collections and laboratory chemical analyses of groundwater, etc. Only the cost requirement outlined in the DID of Sequence 19 need be submitted.

5. Technical Operations Plan (TOP): The contractor shall develop a Technical Operations Plan based upon the technical requirements for Category II sites as requested by Sequence 19, Item VI below. This plan shall be expicit with regards to field procedures. Include, but do not limit the plan to field decontamination operations, sampling protocol, QA/QC field and laboratory procedures, field schedule, etc. A guideline for the plan is provided under separate cover.

6. All well drilling, development, purging, and sampling methods must conform to State and/or other regulatory agencies' requirements. Cite references for the requirements in the Technical Report appendix.

G. MEETINGS

The contractor's project leader shall attend two (2) meetings to take place at times to be specified by the USAFOEHL. The meetings shall take place at Reese AFB for a duration of one day each.

II. SITE LOCATION AND DATES:

Reese AFB, near Lubbock, Texas
Date to be established

III. BASE SUPPORT:

A. The base Point of Contact (POC) shall receive from the contractor the split samples and then select 10% of them, package them, and then deliver them back to the contractor within 24 hours for subsequent overnight shipment to USAFOEHL/SA as stated in Paragraph IA6.

B. The Base Civil Engineer shall assign accumulation points within the installation for the contractor to use to deliver any hazardous drill cuttings or hazardous well installation/development fluids generated from the required work.

C. The Base Civil Engineer will take custody of any hazardous drill cuttings or hazardous well installation/development fluids and properly dispose of the material according to applicable state/federal regulations.

D. The Base POC will make available to the contractor data from the paint trench soil chemical analysis.

E. The Base Civil Engineer will provide a potable water source for use by the contractor during well drilling/development operations if required.

IV. GOVERNMENT FURNISHED PROPERTY: None

V. GOVERNMENT POINT OF CONTACT:

A. USAFOEHL Program Manager

Mr Dennis E. Lundquist
USAFOEHL/TSS
Brooks AFB TX 78235-5501
(512) 536-2158, 2159
AV 240-2158/2395
1-800-821-4528

B. Base Point of Contact (POC)

Lt Gregory G. Zigulis
USAF Hospital/SGPB
Reese AFB TX 79489-5300
(806) 885-3327, 3328
AV 838-3327/3328

C. MAJCOM Monitor

Lt Col Ronald L. Schiller
HQ ATC/SGPB
Randolph AFB TX 78150-5001
(512) 652-5271
AV 487-5271

VI. CONTRACT DATA ITEM DESCRIPTIONS (DID)

In addition to sequence numbers 1, 5, and 11 in Attachment 1 to the contract, which are applicable to all orders, the sequence numbers listed below are applicable to this order. Also shown are data applicable to this order.

| Seq. No. | Block 10 | Block 11 | Block 12 | Block 13 | Block 14 |
|---|---|---|---|---|---|
| 3 | O/Time | * | * | --- | 4 |
| 19** | O/Time | 86 MAY 19 | 86 JUN 02 | --- | 12 |
| 7 | O/Time | 86 JUN 02 | 86 JUN 16 | --- | 7 |
| 4 | One/R | 86 AUG 18 | 86 OCT 14 | 87 MAY 21 | *** |
| 19** | O/Time | 86 AUG 18 | 86 OCT 14 | --- | 7 |
| 14 | Monthly | 86 JUN 16 | 86 JUL 01 | **** | 2 |
| 15 | Monthly | 86 JUN 16 | 86 JUL 01 | **** | 2 |

*Upon completion of analytical effort before submission of the first draft Technical Report.

**Two Technical Operations Plans (TOP) are required for this stage. The first one is for the current effort and is due within two (2) weeks after the Notice to Proceed (NTP). The second one shall be sent with the final Technical Report and shall detail the plans for any required follow-on work for Category II sites.

***Two draft reports and one final report are required. Incorporate Air Force

comments into the second draft and final report as specified by the USAFOEHL. Supply the USAFOEHL with a single copy of the first draft, second draft, and final reports for acceptance prior to distribution. Distribute all report copies as specified by the USAFOEHL. Supply 25 copies of each draft report and 50 copies plus the original camera-ready copy of the final Technical Report.

****Monthly thereafter.

Attachment 1
Reese AFB Phase II Stage 1

Analytical Methods, Detection Limits, and Number of Samples

| PARAMETER | METHOD | DECTECTION LIMIT (d) | NO. OF SAMPLES | QA | TOTAL SAMPLES |
|---|---|---|---|---|---|
| Purgeable Organic Compounds | SW8010 & SW8020 | 1 mg/Kg | 127 soil | 13 soil | 204 soil[f] |
| | E601 & E602 | a | 17 water | 2 water | 28 water[g] |
| Pesticides | SW3550, then SW8080 | | | | |
| | SW3550, then SW8140 SW8150 | 1 mg/Kg | 40 soil | 4 soil | 64 soil[h] |
| | E608, SW8140 and A509B | a | 10 water | 1 water | 16 water[i] |
| Base/neutral/ acids extractable organics | SW3550, then SW8270 | 1 mg/Kg | 51 soil | 5 soil | 82 soil[j] |
| | E625 | a | 17 water | 2 water | 28 water[k] |
| Oil & Grease | E413.2 (modified for soils) | 100 µg/g | 127 soil | 13 soil | 140 soil |
| (using IR) | E413.2 | 200 µg/L | 17 water | 2 water | 19 water |
| Petroleum Hydrocarbons | E418.1 (modified for soils) | 10 mg/Kg | 20 soil | 2 soil | 22 soil |
| Polynuclear Aromatic Hydrocarbons | SW3550, then SW8100 | a | 12 soil | 1 soil | 19 soil[l] |
| Phenols | SW3550, then SW8040 | a | 61 soil | 6 soil | 98 soil[m] |
| | E604 | a | 17 water | 2 water | 19 water |
| Total Dissolved Solids (TDS) | E160.1 | 1 mg/l | 17 water | 2 water | 19 water |
| Metals, Primary | SW3050, then SW6010 | e | 14 soil | 1 soil | 15 soil |
| | E200.7 | a | 17 water | 2 water | 19 water |



recycled paper

| PARAMETERS | METHOD | DETECTION LIMIT (d) | NO. OF SAMPLES | QA | TOTAL SAMPLES |
|---|---|---|---|---|---|
| Arsenic | SW3050, then SW7060 | 0.1 mg/Kg | 26 soil | 3 soil | 29 soil |
| Cadmium | SW3050, then SW7130 | 0.5 mg/Kg | 25 soil | 3 soil | 28 soil |
| Chromium | SW3050, then SW7190 | 5 mg/Kg | 55 soil | 6 soil | 61 soil |
| Copper | SW3050, then SW7210 | 2 mg/Kg | 20 soil | 2 soil | 22 soil |
| Lead | SW3050, then SW7420 | 10 mg/Kg | 55 soil | 6 soil | 61 soil |
| Nickel | SW3050, then SW7520 | 0.4 mg/Kg | 25 soil | 3 soil | 28 soil |
| Zinc | SW3050, then SW7950 | 0.05 mg/Kg | 25 soil | 3 soil | 28 soil |
| pH | E150.1 | -- | 17 water | 2 water | 19 water |
| EP Toxicity (Metals) | SW Manual | b | 35 soil | 4 soil | 39 soil |
| Ignitability | SW1010 | c | 35 soil | 4 soil | 39 soil |

[a]Detection limits as specified by the applicable EPA or Standard Method.

b

| Metal | µg/L leaching solution |
|---|---|
| As | 0.002 |
| Ba | 0.1 |
| Cd | 0.005 |
| Cr | 0.05 |
| Pb | 0.1 |
| Hg | 0.0002 |
| Se | 0.002 |
| Ag | 0.01 |

[c]Find if sample is ignitable at 140 degrees Farenheit or below. If so, it is a hazardous waste, in accordance with 40 CFR 261.21.

[d]For soil samples, report results as mg/Kg of dry soil. Report moisture content for each soil sample.

[e]

| Metal | mg/Kg |
|---|---|
| Sb | 15 |
| Be | 0.2 |
| Cd | 2 |
| Cr | 4 |
| Cu | 3 |
| Pb | 20 |
| Ni | 8 |
| Ag | 4 |
| Tl | 20 |
| Zn | 1 |

[f]Total of 204 includes second column confirmation for 50% of the samples (64).

[g]Total of 28 includes second column confirmation for 50% of the samples (9).

[h]Total of 64 includes second column confirmation for 50% of the samples (20).

[i]Total of 16 includes second column confirmation for 50% of the samples (5).

[j]Total of 82 includes second column confirmation for 50% of the samples (26).

[k]Total of 28 includes second column confirmation for 50% of the samples (9).

[l]Total of 19 includes second column confirmation for 50% of the samples (6).

[m]Total of 98 includes second column confirmation for 50% of the samples (31).

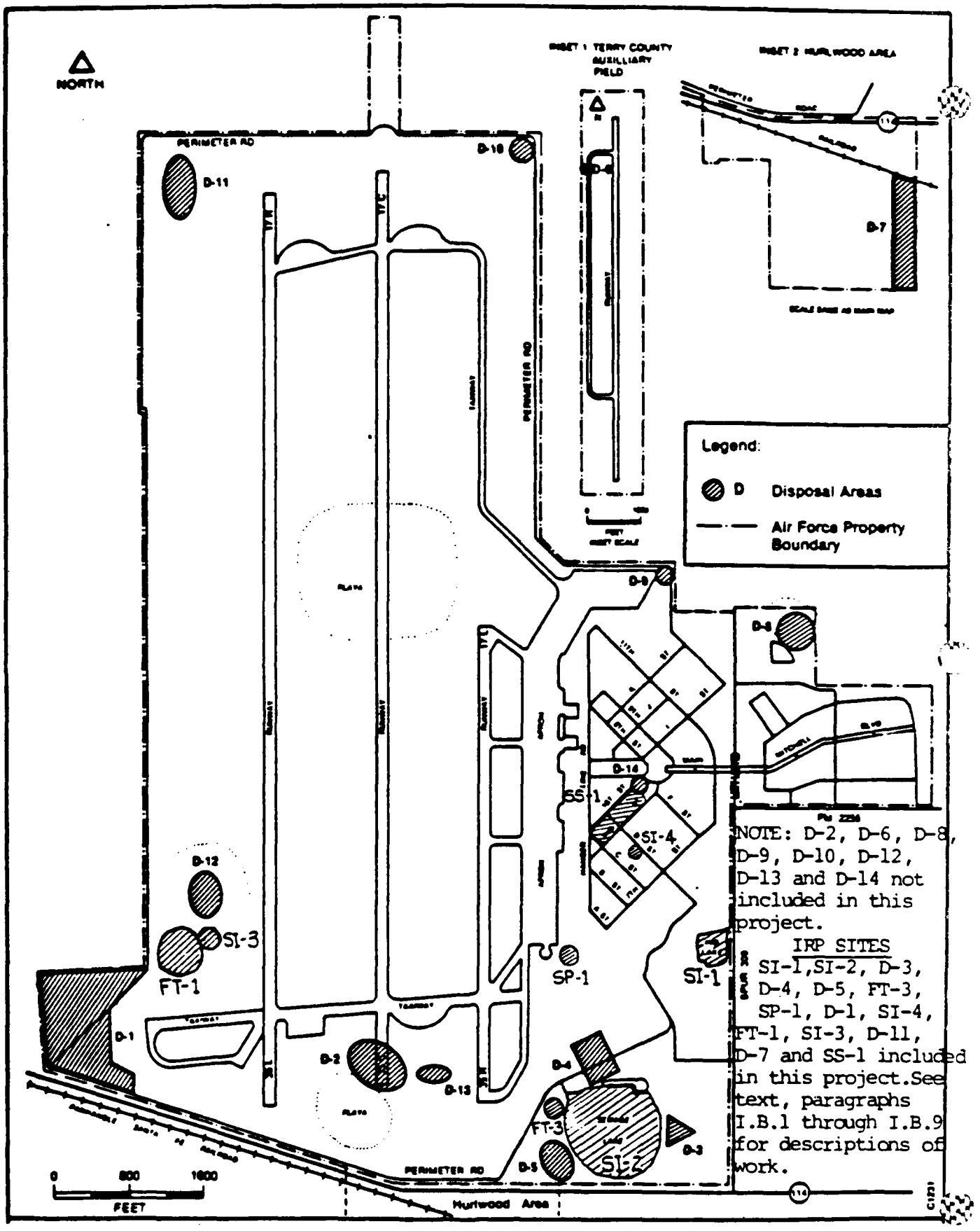


Figure 1 - Locations of IRP Sites, Reese AFB, Lubbock County, Texas

# APPENDIX C

## WELL/BORING NUMBERING SYSTEM

Table C-1

WELL/BORING NUMBERING SYSTEM

| Site No. | Boring Designation |
|---|---|
| 001 | 001-B2<br>001-B3<br>001-W1 |
| 002 | 002-B1<br>002-B2<br>002-B3<br>002-W1 |
| 003 | 003-B1<br>003-B2<br>003-B3<br>003-B4 |
| 004 | 004-B1<br>004-B2<br>004-B3<br>004-W1 |
| 005 | 005-W1 |
| 006 | 006-B1<br>006-B2 |
| 007 | 007-B1<br>007-B2<br>007-B3<br>007-B4 |
| 008 | 008-B1<br>008-B2 |
| 009 | 009-B1 to<br>009-B10 |

B = Soil boring
W = Soil boring converted to monitoring well

APPENDIX D

BORING LOGS/MONITORING WELL

CONSTRUCTION DIAGRAMS/WELL DATA

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB IRP - (DF200c) Well Casing Size and Type: 4" PVC

Site Location: SITE 002 - SEWAGE LAKE Screen Size and Type: 4"x.010" slot PVC

Boring/Well No.: 002-W1 Screened Interval: 170-140

Drilling Contractor: ENVIRONMENTAL DRILLING CORP. Boring Diameter: 8 5/8" Well Diameter: 4"

Drilling Equipment: Failing 1250 - ROTARY Date: 8-13-86 Start ~~Time~~: N/A

Driller: Bob Masten Geologist: MICHAEL BENNER Completion ~~Time~~ DATE: 8-15-86

Driller's Helper: Rick Reed

Total Depth of Hole: 180 Groundwater Depth: 97.67 (Below top of PVC)

Completion Depth: 180 Surface Elevation: 3294.90

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
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# DRILLING LOG

| | | |
|---|---|---|
| SITE NAME: | SITE I.D: | SITE LOCATION: 002 |
| TDD #R6- | DATE: | HOLE DESIGNATION: |
| HOLE LOCATION: | GROUND ELEV: | |
| TOP OF CASING ELEV; | CASING SIZE AND TYPE: | |
| SCREEN SIZE: | TECH. MGR: | CONTRACTOR: |
| | DRILLER/HELPER: | |

COMMENTS:

| Depth | N- Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | Depth | Completion Data |
|---|---|---|---|---|---|---|
| 0 | | | | | | |
| | | 9042 | | No Sample<br>0-2-grey clay, trace silt, changing to silt, trace clay<br>2-5-Grey silt; fine gravel, 20%; some clay | | |
| 10 | | | | 10'-Brown silt with clay; fine-medium gravel, 25% | | |
| | | 9043 | | 15-16'-Red/brown and tan clay with some silt; fine gravel, 15%<br>16-16.5'-Red/brown and tan dry silt with some clay | | |
| 20 | | | | 20'-Tan and red/brown silt with some clay; some fine gravel, 5% | | |
| | | | | 25' Red silts with some clay; coarse gravel, 10% | | |
| 30 | | | | 30'-Red/grey caliche; some yellow stained pieces | | |
| | | | | 35'-Red/grey carbonate Caliche | | |
| 40 | | | | 39-40'-Grey silt with red/grey caliche | | |
| | | | | 45'-Grey silt; trace clay; fine; varicolored gravel, fine to medium | | |
| 50 | | 9183 | | 50'-Tan sand, very fine | | |
| | | | | 55'-Reddish-tan silt; some sand, fine to medium, 5-10% | | |
| 60 | | | | 60'-Pink mix of silt, clay; with some fine to medium sand <5% | | |
| | | | | 65'-75'-Pink mix of clay with silt; sand to fine gravel, 15% | | |
| 70 | | | | | | |
| | | | | | | |
| 80 | | | | 80'-Multicolored coarse and fine gravel, subangular; pinkish clay and silt | | |
| | | | | 85-90'-Multicolored medium gravel to coarse pebbles to medium sand; semiangular to semirounded; clay and silt fines | | |
| 90 | | | | | | |

# DRILLING LOG

SITE NAME: | SITE I.D: | SITE LOCATION: 002

TDD #R6- | DATE: | HOLE DESIGNATION:

HOLE LOCATION: | GROUND ELEV:

TOP OF CASING ELEV; | CASING SIZE AND TYPE:

SCREEN SIZE: | TECH. MGR: | CONTRACTOR:

DRILLER/HELPER:

COMMENTS:

| Depth | N - Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | Depth | Completion Data |
|---|---|---|---|---|---|---|
| 90 | | | | | | |
| | | | | 95'-Multicolored medium to coarse sand with some medium gravel, semiangular to semirounded; clay and silt fines | | |
| 100 | | | | 100'-Multicolored sand to gravel, 1/8" or larger, with some clay; silt and clay fines | | |
| | | | | 105'-Tan gravel mixed with clay and silt fines | | |
| 110 | | | | 110'-Multicolored sand, fine to coarse; tan silt and clay fines | | |
| | | | | 115-125'-Tan clay and silt fines; fine to coarse sand, 60% | | |
| 120 | | | | | | 121' |
| | | | | | | 128' |
| 130 | | | | 130'-Tan silt and clay fines; fine to coarse sand, 60% | | |
| | | | | 135'-Tan clay with some silt; fine sand, 20% | | |
| 140 | | | | 140'-Tan clay with silt | | 140' |
| | | | | 145'-Tan clay with medium sand, 20%; pods of grey/blue clay | | |
| 150 | | | | 150'-Yellowish clay with some silt; fine to medium sand <15% | | |
| | | | | 155'-Yellow/tan clay and silt; fine to medium sand 25% some pods of gray clay | | |
| 160 | | | | 160'-Yellow/tan clay and silt; fine to medium sand, 20% | | |
| | | | | 165'-Clay and broken sand/gravel | | |
| 170 | | | | 170'-Blue/grey Clay; fine-medium sand, 20% | | 170' |
| | | | | 175'-Blue/grey clay; broken yellow gravel and sand fragments | | |
| TD 180 | | | | 180'-Blue/grey clay; gravel and sand | | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB IRP-(DF2000) Well Casing Size and Type: 4" PVC

Site Location: SITE 005 (Civil Engineering Trench) Screen Size and Type: 4"x .012" slot PVC

Boring/Well No.: 005-W1 Screened Interval: 127-97

Drilling Contractor: Environmental Drilling Corp. Boring Diameter: 8 5/8 Well Diameter: 4"

Drilling Equipment: Failing 125c-Rotary Date: 8-2-86 Start Time: NA

Driller: Bob Masten Geologist: Dave Palmerton Completion ~~Time~~ Date: 8-4-86

Driller's Helper: Rick Reed

Total Depth of Hole: 133' Groundwater Depth: 116.63 (Below top of PVC casing)

Completion Depth: 133' Surface Elevation: 3318.84

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
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## DRILLING LOG

SITE NAME: SITE I.D: SITE LOCATION: 005

TDD #R6- DATE: HOLE DESIGNATION:

HOLE LOCATION: GROUND ELEV:

TOP OF CASING ELEV; CASING SIZE AND TYPE:

SCREEN SIZE: TECH. MGR: CONTRACTOR:

DRILLER/HELPER:

COMMENTS:

| Depth | N - Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | DEPTH | Completion Data |
|---|---|---|---|---|---|---|
| 0 | | | | No Sample | | |
| | | 9090 | | 3-4'-Light brown/beige clays with sand and Caliche pebbles, dark mottles 3rd stained | | |
| | | | | 4-5'-Beige clays | | |
| 10 | | | | -10'-Light brown/beige silts and clays, very coarse sand to very fine Caliche pebbles | | |
| | | 9091 | | 15-17'-Brown/red silts and clays with a few Pebbles & well-rounded caliche, 10-15mm | | |
| 20 | | | | -20'-Brown/red stained silts, clays, pebbles 2-8mm, poorly sorted, broken and weathered pieces of caliche | | |
| | | | | -25'-Brown red and white pieces of caliche with silts and clays, larger pieces 8-14mm | | |
| 30 | | | | | | |
| | | 9092 | | 33-34.5'-White with red-brown mottle dense caliche carbonate pieces; silt-clay-size particles | | |
| 40 | | | | -40'-White to light brown carbonate sands-silts; caliche carbonate unweathered zone | | |
| | | | | -45'-Beige dense carbonate caliche, small salt & pepper marks | | |
| 50 | | | | -50'-Beige dense carbonate caliche (and sandstone - no sandstone sample taken) | | |
| | | | | -55'-Caliche carbonate; sand-silts with small smoothed, subrounded grey pebbles (and sandstone - no sandstone sample taken) | | |
| 60 | | | | -60'-Very light brown Caliche carbonate, broken, subangular-angular pieces | | |
| | | | | -65'-White caliche carbonate, with few red-rust colored pieces | | |
| 70 | | | | -70'-Small pieces of caliche; very fine silt-medium clay | | |
| | | | | -75'-Sandy-Silty-Clay light beige-pinkish cast; some small ground Caliche | | |
| 80 | | | | -80'-Broken Caliche, Fines; silt and clay light brown with pink cast | 80' | |
| | | | | -85-90'-Very coarse sand to very fine silt, beige with pink cast, moderately plast | | |
| 90 | | | | | | |

# DRILLING LOG

SITE NAME: SITE I.D: SITE LOCATION: 005

TDD #R6- DATE: HOLE DESIGNATION:

HOLE LOCATION: GROUND ELEV:

TOP OF CASING ELEV; CASING SIZE AND TYPE:

SCREEN SIZE: TECH. MGR: CONTRACTOR:

DRILLER/HELPER:

COMMENTS:

| Depth | N - Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | Depth | Completion Data |
|---|---|---|---|---|---|---|
| 90 | | | | 95'- Fine pebbles to coarse sand; mixed with: 20% silts and clay, 10-15% quartz pebbles, remainder carbonate pebbles, light brown, varied colors to quartz pebbles | 97' | |
| 100 | | | | 100'- Medium pebbles to coarse sands mixed with silt and clay fines; pebbles of quartz are rounded to well rounded; light brown silts and clays, white carbonate matrix and pebbles, varied colors of quartz pebbles | | |
| 110 | | | | 110-115'- Gravels and quartz sands, some fines and clays; quartz sands varied colors, 0.1-1 mm size; mustard colored clays mixed in with gravels; gravels loosely cemented | | |
| 120 | | | | 125-133'- lenses of blue/grey clay; ground-up silica sands of various colors, Sand particle size 0.5-0.8 mm | 127' | |
| 130 | | | | | | |
| TD 133 | | | | | | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB IRP (DF-2006) Well Casing Size and Type: 4" PVC

Site Location: Site 001 (Industrial Area) Screen Size and Type: 4" x .012" slot PVC

Boring/Well No.: 001-W1 Screened Interval: 171 - 141

Drilling Contractor: Environmental Drilling Corp. Boring Diameter: 8 3/4" Well Diameter: 4"

Drilling Equipment: Failing 1250-Rotary Date: 7-29-86 Start Time: N/A

Driller: Bob Masten Geologist: Dave Palmerton Completion ~~Time~~ Date: 8-1-86

Driller's Helper: Rick Reed

Total Depth of Hole: 176 Groundwater Depth: 103.08 (Below top of PVC)

Completion Depth: 176 Surface Elevation: 3277.75

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
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# DRILLING LOG

SITE NAME: SITE I.D: SITE LOCATION: 001

TDD #R6- DATE: HOLE DESIGNATION:

HOLE LOCATION: GROUND ELEV:

TOP OF CASING ELEV; CASING SIZE AND TYPE:

SCREEN SIZE: TECH. MGR: CONTRACTOR:

DRILLER/HELPER:

COMMENTS:

| Depth | N- Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | Depth | Completion Data |
|---|---|---|---|---|---|---|
| 0 | | 9021 | | 3-4' No Sample | | |
| | | | | 5-6'-Grey clay; fine silts and sands | | |
| 10 | | | | 10'-Gray fine silts and clay; some small pebbles, highly plastic | | |
| | | 9022 | | 15'-Grey fines and clay | | |
| 20 | | | | 20-21'-Grey with rust-brown mottling, highly plastic fines and clay | | |
| | | | | 25-26'-Light grey with some rust color, fines and clay, silty | | |
| 30 | | 9023 | | 30-31'-Grey highly plastic clay; sand 0.1-0.25 mm, off-white, well sorted | | |
| | | | | 38-40'-Off-white, some light salt and pepper color caliche, hard, compact, very fine, well cemented | | |
| 40 | | | | 45-47'-Off-white, some salt and pepper color caliche, hard, compact, fine sand particles, well cemented; some grey and rust; particle size < 0.1 mm. | | |
| 50 | | 9024 | | 50-51'-White clay lens, underlain by hard caliche | | |
| | | | | 55-56'-White to off-white fine clay, high plastic with a few small pieces of well-cemented caliche | | |
| 60 | | | | 60-71' White Clay with some rust colored pieces | | |
| 70 | | | | 75-76'-Brownish-white fine clays with some rust color. | | |
| 80 | | | | 80-81'-Grey-white very fine clay-silt with some rust color, particle size <0.1 mm. | | |
| | | | | 85-86'-Grey/off-white fine clay mixed with quartz pebbles of various colors (red, black, rust), subrounded to rounded, subprismoidal to subdiscoidal | | |
| 90 | | | | | | |

# DRILLING LOG

SITE NAME: SITE I.D: SITE LOCATION: 001

TDD #R6- DATE: HOLE DESIGNATION:

HOLE LOCATION: GROUND ELEV:

TOP OF CASING ELEV; CASING SIZE AND TYPE:

SCREEN SIZE: TECH. MGR: CONTRACTOR:

DRILLER/HELPER:

COMMENTS:

| Depth | N - Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | Depth | Completion Data |
|---|---|---|---|---|---|---|
| 90 | | | | 90-95'-Red to rust conglomerate, medium pebble, quartzitic, well rounded | | |
| | | | | 95-101' - No Sample (Fine silty-clay) | | |
| 100 | | | | 101-102'-Light brown fine silty clay | | |
| | | | | -105-111'-Light brown fine silt-clay with some quartz pebbles. | | |
| 110 | | | | -115-121'-Light brown fine clay, some grey clay, with a few quartz pebbles | | |
| 120 | | | | | 119' | |
| | | | | -130-151'-Light brown very fine clay | 128' | |
| 140 | | | | | 141' | |
| 150 | | | | -155-161'-No Sample (very fine clay) | | |
| 160 | | | | -165-166'-Brown clay fines mixed with quartzitic pebbles, 2-3mm, subrounded | | |
| 170 | | | | -170-171'-Blue clay, some small broken up pieces & quartz pebbles | 171' | |
| TD 176 | | | | -175-176'-Brown clay, few small quartz pebbles/sand | | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB IAP - (DF200C) Well Casing Size and Type: 4" PVC

Site Location: Site 004 - Southwest Landfill Screen Size and Type: 4" x .012" slot PVC

Boring/Well No.: 004-W1 Screened Interval: 175-185 / 145-125

Drilling Contractor: Environmental Drilling Corp Boring Diameter: 8 5/8 Well Diameter: 4"

Drilling Equipment: Failing 1250 - Rotary Date: 8-5-86 Start Time: N/A

Driller: Bob Masten Geologist: Dave Palmerton Completion ~~Time~~ DATE: 8-11-86

Driller's Helper: Rick Reed

Total Depth of Hole: 185' Groundwater Depth: 129.19 (Below Top of PVC)

Completion Depth: 185' Surface Elevation: 3336.57

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
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# DRILLING LOG

SITE NAME: SITE I.D: SITE LOCATION: 004

TDD #R6- DATE: HOLE DESIGNATION:

HOLE LOCATION: GROUND ELEV:

TOP OF CASING ELEV; CASING SIZE AND TYPE:

SCREEN SIZE: TECH. MGR: CONTRACTOR:

DRILLER/HELPER:

COMMENTS:

| Depth | N- Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | Depth | Completion Data |
|---|---|---|---|---|---|---|
| 0 | | | | 3'- Red/brown clay; fine silts; carbonate pebbles 2-10mm; clays are medium plasticity, dark grey mottled | | |
| | | | | 5'- Red/brown clays; silts; carbonate pebbles/nodules | | |
| 10 | | | | 10'- Red/brown clays; silts; broken pieces of caliche | | |
| | | | | 15'- Brown/red clays, mixed with grey clays and fine silts; small 1-2mm black chips; carborate pebble | | |
| 20 | | | | 20'- Red fine sands and pieces; red/brown clays; white carbonate fragments; fine silts | | |
| | | | | 30-31'- Red/brown Sands, silts | | |
| 30 | | | | 31-32.5'- Caliche; brown and white pieces of sand; silts and clays present with sandstone pieces. | | |
| | | | | 35'- White and red/brown clays; broken white caliche pieces, 2-4mm, mixed with clays and silts | | |
| 40 | | | | 40-45'- White and red/brown clays; caliche chips | | |
| 50 | | | | 55'- Caliche chips; white clays; fines | | |
| 60 | | | | 60'- White with rust-mottles caliche; very consolidated | | |
| | | | | 65-70'- Caliche, silt and clay-size, with pink cast | | |
| 70 | | | | 75'- Ground sand, silt and clay-size; white with pink cast Caliche | | |
| 80 | | | | 80-95'- White Caliche, lopsely cemented, well-ground chips | | |
| 90 | | | | | | |

# DRILLING LOG

SITE NAME: SITE I.D: SITE LOCATION: 004

TDD #R6- DATE: HOLE DESIGNATION:

HOLE LOCATION: GROUND ELEV:

TOP OF CASING ELEV; CASING SIZE AND TYPE:

SCREEN SIZE: TECH. MGR: CONTRACTOR:

DRILLER/HELPER:

COMMENTS:

| Depth | N - Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | Depth | Completion Data |
|---|---|---|---|---|---|---|
| 90 | | | | | | |
| 100 | | | | | | 104' |
| 110 | | | | | | 114' |
| 120 | | | | 115'- Quartz sands and Gravel, subangular to subrounded, various colors | | |
| | | | | 120'- Fine Gravel and quartz Sands, angular to subangular, various colors, some dark mustard colored clays mixed in | | |
| | | | | 125'- Clays mixed with sands and sandstone pieces, various colors | | 125' |
| 130 | | | | 130'- 60% grey sandstone chips with mustard colored clay and pebbles/sands of various colors | | |
| | | | | 135'- Large 8-15mm pebbles of various colors; mostly quartz, angular to subrounded; some fine clays washed out | | |
| 140 | | | | 140'- Brown Clays and fine Silts; pebbles of various colors mixed in 20%, pebbles subangular to subrounded, 10-12mm in size. | | |
| | | | | 145'- Fine silts and clays; some pebbles of various colors, 8-10mm in size | | 145' |
| 150 | | | | 150'- Brown clays and fine silts; some very fine pebbles 2-3mm in size | | |
| | | | | 155'- Brown clays and fine silts; 10-20% pebbles, subangular and subprismoidal, 6-10mm in size | | |
| 160 | | | | 160'- Brown silts; pebbles of black and various colors, angular to subangular, 2-6mm in size, most pebbles are quartz | | |
| | | | | 165'- Brown silts; very few <5% 1-2mm sand and fine pebbles. | | 165' |
| 170 | | | | 170'- Light brown clays; some <5% fine silts; fine quartz pebbles | | |
| | | | | 175'- Variety of colors (browns, reds, whites), sand-sized cuttings; some brown silts and clays | | 175' |
| 180 | | | | | | |

# DRILLING LOG

SITE NAME: SITE I.D: SITE LOCATION: 004

TDD #R6- DATE: HOLE DESIGNATION:

HOLE LOCATION: GROUND ELEV:

TOP OF CASING ELEV; CASING SIZE AND TYPE:

SCREEN SIZE: TECH. MGR: CONTRACTOR:

DRILLER/HELPER:

COMMENTS:

| Depth | N - Blows per 6" | Sample | Graphic Log | SAMPLE DESCRIPTION | Depth | Completion Data |
|---|---|---|---|---|---|---|
| 180 | | | | 180' - Various color sands, 0.5-1mm | | |
| TD 185 | | | | 185' - Beige clays | | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 008 Hurlwood Screen Size and Type: NA

Boring/Well No.: 008-B2 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobil B-53 - Hollow stem auger Date: 8-12-86 Start Time: 12:51

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 14:36

Driller's Helper: Eddie Chandler

Total Depth of Hole: 18.5' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 331434

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 10-2.5 | 9108 | | | | 1.0-1.6 Fill<br>1.6-2.5 Brown dry silt | 0-1.0 Augered |
| 5.0-6.5 | | 4-4-4 | | | 5.0-6.5 Red and brown dry powdery silt, | |
| 10.0-11.5 | | 5-16-24 | | | 10.0-11.5 Tan silt with some white pods some black. | |
| 15.0-16.5 | 9109 | 21-41-55 | | | 15.0-16.5 Red/brown very tight silt with white silt pods, | |
| 17.0-18.5 | 9110 | 17-27-46 | | | 17.0-18.5 Same as above with some red/brown clay at 18.1-18.3. | Auger refusal at 17.0', |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 008 Hurlwood Screen Size and Type: NA

Boring/Well No.: 008-B1 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 8-12-86 Start Time: 09:00

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 11:59

Driller's Helper: Eddie Chandler

Total Depth of Hole: 25.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 330650

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0-2.5<br>2.5-4.0 | (9105<br>9139) | 2-6-7<br>2-5-4 | | NA | 1.0-2.5 Black/brown silt loam.<br>2.5-4.0 Same as above. | 0-1.0 Augered |
| 5.0-6.5 | | 8-19-21 | | | 5.0-5.4 Black/brown silt loam.<br>5.4-6.5 Dark gray dry silt. | |
| 10.0-11.5 | | 3-10-18 | | | 10.0-11.5 Green/gray stiff clay with trace of silt. | |
| 15.0-16.5 | 9106 | 7-17-23 | | | 15.0-15.6 Green/gray clay with some silt, stiff.<br>15.6-16.5 Green/gray silt with some clay, mottled, stiff. | |
| 20.0-21.5 | | 4-14-19 | | | 20.0-21.5 Gray/green clay with some silt, stiff, sand pod - 20.0-20.2. | |
| 24.0-25.5 | 9107 | 7-24-50 | | | 24.0-24.7 Gray/green clay, stiff.<br>24.7-25.0 Stained gray/green silt with some clay.<br>25.0-25.6 Gray/green very tight dry silt. | Augers would not penetrate beon 24 feet due to heavy clay. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP(DF-2000) Well Casing Size and Type: NA

Site Location: Site007 Screen Size and Type: NA

Boring/Well No.: 007-B4 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile-B-53-Hollow stem auger Date: 8-5-86 Start Time: 15:31

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 16:30

Driller's Helper: Eddie Chandler

Total Depth of Hole: 28.5' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3331.64

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 5.0-6.5 | 9102 | 7-10-11 | | | 5.0-5.8 Gravel fill, asphalt & top soil.<br>5.8-6.5 Gray silt | OVA - 1-2 ppm |
| 10.0-11.5 | | 4-21-25 | | | 10.0-11.5 White/tan dry silt. | OVA - 0 |
| 15.0-16.5 | 9103 | 6-27-45 | | | 15.0-16.0 Brown tight silt.<br>16.0-16.2 Gray silt.<br>16.2-16.5 Brown tight silt with some 1/16" gravel. | OVA - 0 |
| 20.0-21.5 | | 9-23-34 | | | 20.0-20.4 Fill, asphalt, dark brown silt, trace clay.<br>20.4-21.5 Tan silt, 5% 1/16" gravel. | OVA - 0 |
| 25.0-25.5 | 9104 | 11-45(3") | | | 25.0-25.5 Gray/brown fine sand. | OVA - 0 |
| 28.0-28.5 | 9138 | | | | 28.0-28.5 Tan fine sand with caliche. | Split spoon would not penetrate beyond 28.5'. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP(DF-2000) Well Casing Size and Type: NA

Site Location: Site 007 Screen Size and Type: NA

Boring/Well No.: 007-B3 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 8-5-86 Start Time: 13:09

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 14:58

Driller's Helper: Eddie Chandler

Total Depth of Hole: 31.5' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3332.27

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0-2.5 | | 6-7-15 | | | 1.0-1.2 Black/brown silt loam.<br>1.2-2.1 Asphaltic fill gravel.<br>2.1-2.5 Brown dry silt. | 0-1.0 Augered<br>OVA - 0 |
| 5.0-6.5 | 9099 | 8-17-27 | | | 5.0-5.4 Brown silt<br>5.4-6.5 Tan/brown dry silt. | |
| 10.0-11.5 | | 11-8-16 | | | 10.0-10.8 Tan/white tight dry silt.<br>10.8-11.5 Brown tight dry silt. | |
| 15.0-16.5 | 9100 | 13-13-18 | | | 15.0-15.4 Medium brown silt.<br>15.4-16.5 White and brown/tan dry silt. | |
| 20.0-21.5 | | 17-19-25 | | | 20.0-20.4 Brown/tan silt.<br>20.4-20.9 White and tan silt.<br>20.9-21.5 Tan tight dry silt. | |
| 25.0-26.5 | | 19-16-25 | | | 25.0-25.4 White/tan silt.<br>25.4-25.8 Brown silt<br>25.8-26.5 Tan very fine sand. | |
| 30.0-31.5 | 9101 | 11-23-43 (5") | | | 30.0-31.2 Brown fine sand.<br>31.2-31.5 Brown very tight dry silt. | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 007 Screen Size and Type: NA

Boring/Well No.: 007-B2 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53-Hollow stem auger Date: 8-5-86 Start Time: 10:29

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 12:31

Driller's Helper: Eddie Chandler

Total Depth of Hole: 31.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3329.64

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 0-2.5 | | 4-7-9 | | | 1.0-1.7 Dark brown silt loam.<br>1.7-2.5 Brown dry silt. | 0-1.0 Augered<br>OVA - 0 |
| 5.0-6.5 | 9096 | 7-17-22 | | | 5.0-5.7 Brown dry silt.<br>5.7-6.2 Brown/white silt.<br>6.2-6.5 Red/brown dry tight silt. | OVA - 0 |
| 10.0-11.5 | | 9-20-50 (5") | | | 10.0-11.0 Brown/tan dry tight silt.<br>11.0-11.3 Red/brown silt.<br>11.3-11.4 Brown silt with 1/16" gravel, very tight. | OVA - 0 |
| 15.0-16.5 | 9097 | 16-34-50(4") | | | 15.0-15.8 Brown silt.<br>15.8-16.1 Gray flaggy silt.<br>16.1-16.4 Tan tight silt. | OVA - 0 |
| 20.0-21.5 | | 16-34-52 | | | 20.0-21.5 White and tan very tight dry silt. | OVA - 0 |
| 25.0-26.5 | | 16-24-24 | | | 25.0-26.5 White/brown tight dry silt. | |
| 30.0-31.5 | 9098 | 21-33-50(5") | | | 30.0-31.5 Red/brown dry silt. | OVA - 0 |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP(DE-2000) Well Casing Size and Type: NA

Site Location: Site 007 - Screen Size and Type: NA

Boring/Well No.: 007 - B1 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 8-5-86 Start Time: 08:29

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 10:01

Driller's Helper: Eddie Chandler

Total Depth of Hole: 18.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3329.16

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 - 2.5 | | 3-6-12 | | | 1.0-1.8 Black/brown silt loam top soil.<br>1.8-2.5 Brown dry silt. | 0-1.0 Augered.<br>OVA-0 |
| 5.0 - 6.5 | 9093 | 5-10-20 | | | 5.0-5.4 Dark brown silt trace clay.<br>5.4-5.9 Brown tight dry silt.<br>5.9-6.3 White/reddish tight dry silt.<br>6.3-6.5 Brown tight dry silt. | OVA-0 |
| 10.0 - 11.5 | | 9-27-45 | | | 10.0-11.5 Tan/reddish tan tight dry silt. | |
| 15.0 - 16.5 | 9094 | 12-17-30 | | | 15.0-15.8 Same as above.<br>15.8-16.5 Red/brown tight dry silt. | OVA-0 |
| 17.0 - 18.5 | 9095 | 5-27-50(3") | | | 17.0-18.5 Brown very tight silt, trace white silt. | OVA-0<br>Auger penetration stopped at 17.' Too hard. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 001 - Landstrom Lake Screen Size and Type: NA

Boring/Well No.: 001-B1 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 7-30-86 Start Time: 11:48

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 15:00

Driller's Helper: Eddie Chandler

Total Depth of Hole: 30.0' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3300.14

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 - 2.5 | | 4-4-5 | | NA | 1.0 - 2.5 Black - dark gray silty clay loam | 0-1.0 Augered |
| 5.0 - 6.5 | 9012 | 3-4-6 | | | 5.0 - 5.4 Gray-brown silty loam<br>5.4 - 6.5 Gray-brown clay, trace silt, dry | OVA - 0 |
| 10.0 - 11.5 | | 4-6-10 | | | 10.0 - 11.5 Gray-green mottled clay, tight-stiff. | OVA - 0 |
| 15.0 - 16.5 | 9013 | 4-6-9 | | | 15.0 - 15.25 Gray-green tight stiff clay.<br>15.25 - 16.1 Gray-green dry silt.<br>16.1 - 16.2 Fine silt, trace tan fine sand.<br>16.2 - 16.5 Gray-green dry silt. | OVA - 0 |
| 20.0 - 21.5 | | 4-9-15 | | | 20.0 - 20.8 Gray dry stiff clay.<br>20.8 - 21.5 Light gray stiff clay to silt, some mottling. | |
| 25.0 - 26.5 | | 6-16-19 | | | 25.0 - 25.1 Black-gray tight clay.<br>25.1 - 25.3 Gray-green tight clay.<br>25.3 - 25.5 Fine sand with clay. | OVA - 0 |
| 27.0 - 28.5 | (9014) | 13-16-22 | | | 25.5 - 25.6 Brown fine sand with clay.<br>25.6 - 26.5 Fine light gray tight dry sand. | |
| 28.5 - 30.0 | (9141) | 5-10-16 | | | 27.0 - 30.0 Fine light gray sand, brown-orange staining. | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 006. Fire Training Area Screen Size and Type: NA

Boring/Well No.: 006-B2 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 8-11-86 Start Time: 15:25

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 17:40

Driller's Helper: Eddie Chandler

Total Depth of Hole: 23.5' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 330.91

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| | | | | | Hole move (3) times due to construction debris. | |
| 5.0-6.5 | 9053 | 6-3-3 | | | 5.0-6.0 Fill, silt loam, bricks, gravel. 6.0-6.5 Very dry powdery silt | |
| 10.0-11.5 | | 13-33-60 | | | 10.0-10.4 Black dry silt 10.4-11.5 White with green tint silt, very tight, dry. | |
| 15.0-16.0 | 9054 | 20-70 | | | 15.0-16.0 White tight dry silt. | |
| 20.0-21.5 | 9055 | 21-43-50(5") | | | 20.0-20.7 White dry silt. 20.7-21.5 Gray/pink/white dry silt. | |
| 23.5 | | 17-21 | | | 23.5 No sample recovered | 23.5' Refusal |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: SITE 006 FIRE TRAINING AREA Screen Size and Type: NA

Boring/Well No.: 006-B1 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 8-11-86 Start Time: 11:45

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 13:40

Driller's Helper: Eddie Chandler

Total Depth of Hole: 26.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3311.74

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 0.0-2.5 | | 3-6-9 | | | 1.0-1.8 Black/brown silt loam<br>1.8-2.5 Brown dry silt. | 0-1.0 Augered |
| 5.0-6.5 | 9049 | 5-30-39 | | | 5.0-5.3 Brown dry silt.<br>5.3-6.5 White dry silt. | |
| 10.0-11.5 | | 6-18-37 | | | 10.0-10.6 White dry silt.<br>10.6-11.5 Tan dry silt. | |
| 13.0-14.5<br>14.5-16.0 | (9050<br>9144) | 9-43-50(3")<br>11-40-50(2") | | | 13.0-13.8 Green/brown silt.<br>13.8-14.5 Weathered stained white silt with red/brown pods.<br>14.5-16.0 Same as above. | |
| 20.0-21.5 | 9051 | - | | | 20.0-20.8 Weathered silt, some staining.<br>20.8-21.2 Brown/tan very fine sand.<br>21.2-21.5 Tan silt. | |
| 25.0-26.5<br>26.5-26.6 | 9052 | 6-16-26<br>50(1") | | | 25.0-26.5 Tan (pink cast) very fine sand. | Auger penetration stopped at 26.5'. Too hard. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DE-2000) Well Casing Size and Type: NA

Site Location: Site 004 Landfill Screen Size and Type: NA

Boring/Well No.: 004-B3 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53-Hollow stem auger Date: 8-1-86 Start Time: 09:30

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 11:55

Driller's Helper: Eddie Chandler

Total Depth of Hole: 31.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3331.72

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0-2.5 | | 4-9-10 | | NA | 1.0-2.5 Silt/clay fill, very dry | 0-1.0 Augered OVA-0 |
| 5.0-6.5 | 9081 | 7-10-8 | | | 5.0-6.5 Red-brown tight dry silt/clay fill. | OVA-0 |
| 10.0-11.5 | | 6-7-11 | | | 10.0-11.5 Red-brown tight silt/clay with some white/gray pods. | OVA-0 |
| 15.0-16.5 | 9082 | 17-30-54 | | | 15.0-16.5 Light brown clay with some silt, streak of white dry fine powdery silt. | OVA-0 |
| 20.0-21.5 | | 17-24-32 | | | 20.0-21.5 Same as above. | OVA-0 |
| 25.0-26.5 | | 16-28-59 | | | 25.0-25.7 Same as above<br>25.7-26.5 Dry caliche. | |
| 30.0-31.5 | (9083<br>9142) | 17-21-27 | | | 30.0-30.6 Caliche<br>30.6-31.5 Caliche with light brown-red dry clay. | OVA-1 to 2 ppm |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP(DF-2000) Well Casing Size and Type: NA

Site Location: Site 004- Landfill Screen Size and Type: NA

Boring/Well No.: 004-B2 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter. 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 -Hollow stem auger Date: 8-1-86 Start Time: 16:21

Driller: Bobby Knapf Geologist: Mike Benner Completion Time: 10:36 8-2-86

Driller's Helper: Eddie Chandler

Total Depth of Hole: 21.0 ' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 33302

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 0 2.5 | | 5-9-10 | | NA | 1.0-2.5 Dark brown silt | 0-1.0 Augered<br>OVA - 0 |
| 5.0-6.5 | 9078 | 8-10-12 | | | 5.0-5.9 Brown silt<br>5.9-6.5 Red-brown tight compact silt | OVA - 0 |
| 10.0-11.5 | | 11-14-12 | | | 10.0-11.5 Dark brown silt with white silt pods, dry, tight. | |
| 15.0-16.5 | 9079 | 13-22-27 | | | 15.0-16.5 Brown/gray tight dry compact silt. | OVA - 0 |
| 19.5 21.0 | 9080 | 7-8-13 | | | 19.5-21.0 Brown dry tight silt with pods of white silt. | 19.5' Augers will not drill any deeper. Too hard. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP(DF-2000) Well Casing Size and Type: NA

Site Location: Site 004 Landfill Screen Size and Type: NA

Boring/Well No.: 004-B1 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 Hollow stem auger Date: 8-1-86 Start Time: 12:46

Driller: Bobby Knapf Geologist: Mike Benner Completion Time: 15:03

Driller's Helper: Eddie Chandler

Total Depth of Hole: 31.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3331.49

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 - 2.5 | 9075 | 6-10-14 | | | 1.0-2.5 Brown silt with some clay | 0-1.0 Augered OVA-0 |
| 5.0 - 6.5 | | 2-5-6 | | | 5.0-6.0 Dark brown clay with some silt. 6.0-6.5 Light tan dry compact silt. | |
| 10.0 - 11.5 | | 10-21-34 | | | | |
| 15.0 - 16.5 | 9076 | 15-30-50 | | | 15.0-16.5 Tan-brown silt with trace clay & caliche peds. | OVA-0 |
| 20.0 - 21.5 | | 15-25-24 | | | 20.0-20.4 Tan-brown dry tight dry silt. 20.4-20.6 Weathered caliche. 20.6-21.5 Tan-brown dry tight silt. | |
| 25.0 - 26.5 | | 7-19-23 | | | 25.0-26.5 Brown tight dry silt | |
| 30.0 - 31.5 | 9077 | 15-25-38 | | | 30.0-30.6 Red-brown tight dry silt. 30.6-31.5 Tan tight dry silt. | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: S.t. 003 POL AREA Screen Size and Type: NA

Boring/Well No.: 003-B4 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 Hollow stem auger Date: 8-3-86 Start Time: 15.00

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 16:16

Driller's Helper: Eddie Chandler

Total Depth of Hole: 20.7' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3327.35

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 0 - 2.5 | | 5-12-13 | | | 1.0-2.5 Brown silt loam. | 0-1.0 Augered |
| 5.0 - 6.5 | 9069 | 8-36-40 | | | 5.0-6.5 Brown tight dry silt. | OVA - 1 ppm |
| 10.0 - 11.5 | 9070 | 18-71 | | | 10.0-10.5 Brown silt.<br>10.5- Caliche | OVA - 0 |
| 15.0 - 16.5 | 9071 | 45-75(3") | | | 15.0-15.8 Brown very tight dry silt, with pods of white silt (caliche). | OVA - 0 |
| 20.0 - 21.5 | | 27-50(2½") | | | 20.0-20.7 Brown/gray very tight silt. | Auger penetration stopped at 20'. Too hard. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 003 DOL AREA Screen Size and Type: NA

Boring/Well No.: 003-B-3 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 8-3-86 Start Time: 12:34

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 14:05

Driller's Helper: Eddie Chandler

Total Depth of Hole: 19.0' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3326.97

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 - 2.5 | | 3-5-6 | | | 1.0-1.7 Black/brown clay with some silt,<br>1.7-2.5 Brown/red silt trace clay | 0-1.0 Augered<br>OVA - 0 |
| 5.0 - 6.5 | 9065 | 3-5-7 | | | 5.0-5.3 Dark brown/black clay with some silt.<br>5.3-6.5 Tan/white dry powdery silt. | OVA - 1 ppm |
| 10.0 - 11.5 | 9066 | 2-6-14 | | | 10.0-10.6 Black/brown tight silt with some tan/white tight silty clay.<br>10.6-11.5 Brown/red tight silt, | |
| 15.0 - 16.5 | 9067 | 15-30-42 | | | 15.0-15.2 Gray stiff clay,<br>15.2-16.0 Red very tight silt with trace of clay. | |
| 17.5 - 19.0 | 9068 | 16-17-19 | | | 16.0-16.5 Red silt with trace of clay and gravel up to 1/8",<br>17.5-18.2 Tan very tight silt.<br>18.2-19.0 Red/brown dry tight silt, | Auger penetration stopped at 17.5', Too hard. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 003 POL AREA Screen Size and Type: NA

Boring/Well No.: 003-B2 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 8-3-86 Start Time: 09:55

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 11:57

Driller's Helper: Eddie Chandler

Total Depth of Hole: 28.5' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3327.06

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 0 - 2.5 | | 2-3-5 | | NA | 1.0-2.5 Dark brown silt with trace of clay | 0-1.0 Augered<br>OVA - 0 |
| 5.0 - 6.5 | 9061 | 3-3-5 | | | 5.0-5.3 Dark brown silt.<br>5.3-5.9 Mixed dark brown silt and tan dry silt with white silt pods<br>5.9-6.5 Tan dry silt with white silt pods. | OVA - 0 |
| 10.0 - 11.5 | 9062 | - | | | 10.0-11.5 Brown silt with tan silt pods, dry, tight. | OVA - 0 |
| 15.0 - 16.5 | 9063 | 6-15-23 | | | 15.0-16.0 Same as above.<br>16.0-16.2 White/gray tight dry silt.<br>16.2-16.5 Brown tight stiff clay. | OVA - 0 |
| 20.0 - 21.5 | 9064 | 3-27-14 | | | 20.0-20.2 Brown tight stiff clay.<br>20.2-20.3 White silt.<br>20.3-21.2 Brown dry silt.<br>21.2-21.5 White silt. | OVA - 0 |
| 25.0 - 26.5 | 91436 | 14-16-18 | | | 25.0-25.3 Brown stiff clay.<br>25.3-26.1 Caliche<br>26.1-26.5 Brown tight silt. | Auger penetration stopped at 27'. Too hard. |
| 27.0 - 28.5 | 9150 | 6-9-12 | | | 27.0-28.5 Red brown and tan tight silt. | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP(DF-2000) Well Casing Size and Type: NA

Site Location: Site 003 - POL AREA Screen Size and Type: NA

Boring/Well No.: 003-B1 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53-Hollow stem auger Date: 8-3-86 Start Time: 07:30

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 09:24

Driller's Helper: Eddie Chandler

Total Depth of Hole: 19.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3328.67

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 2.5 | | 4-4-5 | | NA | 1.0-2.5 Brown dry silt | 0-1.0 Augered OVA -0 |
| 5.0 -6.5 | 9057 | 4-6-9 | | | 5.0-5.7 Dark brown silt 5.7-6.3 Tan dry silt. 6.3-6.5 White dry silt. | OVA - 3 ppm |
| 10.0 -11.5 | 9058 | 17-23-32 | | | 10.0-11.5 Light tan silt with some white silt pods. | OVA - 0 |
| 15.0-16.5 | 9059 | 18-27-31 | | | 15.0-16.5 Same as above. | OVA-3 ppm |
| 17.0 -18.5 / 18.5 -19.5 | 9060 | 21-28-45 / 29-50-50(3") | | | 17.0-19.5 Red/brown very tight silt with white dry silt pods. | Augers would not penetrate beon 17 feet. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 002 Sewage Lake Screen Size and Type: NA

Boring/Well No.: 002-B3 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53-Hollow stem auger Date: 7-31-86 Start Time: 14:05

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 15:42

Driller's Helper: Eddie Chandler

Total Depth of Hole: 20.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3293.76

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 0 - 2.5 | 9039 | 2-2-5 | | NA | 1.0-1.3 Loose top soil<br>1.3-2.5 Black-gray tight stiff dry clay | 0-1.0 Augered<br>OVA - 0 |
| 5.0 - 6.5 | | | | | 5.0-6.2 Black-gray tight clay<br>6.2-6.5 White-tan tight dry powdery silt with some clay. | OVA - 0 |
| 10.0 - 11.5 | | 3-11-23 | | | 10.0-10.6 White-gray tight stiff clay.<br>10.6-11.5 Red, pink & gray silt and very fine sand, dry tight. | OVA - 0 |
| 15.0 - 16.5 | 9040 | 6-36-54 | | | 15.0-16.5 Red, pink & gray silt and very fine sand, dry tight. | OVA - 0 |
| 20.0 - 20.5 | | 8-50(<2") | | | No sample recovered. | Auger would not drill beon 20 feet. Too hard. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB-IRP (DF-2000) Well Casing Size and Type: NA

Site Location: S.te 002 Sewage Lake Screen Size and Type: NA

Boring/Well No.: 002-B2 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53-Hollow stem auger Date: 7-31-86 Start Time: 11:10

Driller: Bobby Knapf Geologist: Mike Benner Completion Time: 13:13

Driller's Helper: Eddie Chandler

Total Depth of Hole: 20.5 Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3294.08

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 - 2.5 | 9036 | 2-2-5 | | NA | 1.0-1.8 Black tight clay.<br>1.8-2.5 Black-gray tight clay. | 0-1.0 Augered<br>OVA - 0 |
| 5.0 - 6.5 | | 2-4-6 | | | 5.0-5.7 Black tight dry clay.<br>5.7-6.5 White-tan dry powdery silt. | OVA - 0 |
| 10.0 - 11.5 | | 6-20-30 | | | 10.0-11.5 White-tan stained dry tight silt, very hard. | |
| 15.0 - 16.5 | 9037 | 5-15-30 | | | 15.0-15.5 White tan stained dry silt.<br>15.5-16.5 Very fine tight tan silty sand, some staining. | OVA - 0 |
| 19.0 - 20.5 | 9038 | 5-20-50 | | | 19.0-19.4 Very fine tight white-tan silt with some very fine sand.<br>19.4-20.5 Tan-pink stained dry tight silt with some very fine sand. | Augers would not drill be on 21 feet. Too hard. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB - IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 002 Sewage Lake Screen Size and Type: NA

Boring/Well No.: 002-B1 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 7-31-86 Start Time: 08:30

Driller: Bibby Knopf Geologist: Mike Benner Completion Time:

Driller's Helper: Eddie Chandler

Total Depth of Hole: 21.0' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3298.52

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 - 2.5 | | 5-6-8 | | NA | 1.0 - 2.5 Top soil, fill dirt. | 0-1.0 Augered |
| 5.0 - 6.5 | 9033 | 7-12-10 | | | 5.0 - 5.5 Fill<br>5.5 - 6.5 Dry silt with clay loam. | OVA - 0 |
| 10.0 - 11.5 | | 8-10-20 | | | 10.0 - 10.7 Dry black - brown silt loam.<br>10.7 - 11.5 Dry white compact lime silt. | OVA - 0 |
| 15.0 - 16.5 | 9034 | 10-20-38 | | | 15.0 - 15.3 White compact limey silt.<br>15.3 - 16.5 Very fine tan sand, dry - compact. | OVA - 0 |
| 20.0 - 21.0 | 9035 | 12-45-40(2") | | | 20.0 - 20.4 Fine tan dry compact sand.<br>20.4 - 21.0 Caliche. | Augers would not drill beon 21 feet, Too hard. |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB - IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 001 Industrial Lake Screen Size and Type: NA

Boring/Well No.: 001-B3 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 7/29/86 Start Time: 12:44

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 14:24

Driller's Helper: Eddie Chandler

Total Depth of Hole: 23.5' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 329938

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 - 2.5 | | 1-1-2 | | NA | 1.0-1.3 Brown gray silt with sandy clay<br>1.3-1.4 Fine black brown sand<br>1.4-2.5 Brown tight clay with sandy silt | 0-1.0' Augered |
| 5.0--6.5 | 9018 | 1-3-4 | | | 5.0-5.6 Gray-brown clay to silt<br>5.6-5.8 Fine brown sand<br>5.8-5.9 Gray-brown clay to silt<br>5.9-6.5 Light gray dry silt to clay | OVA - 0 |
| 10.0--11.5 | | 2-15-60 | | | 10.0-10.7 Black moist clay trace silt<br>10.7-11.5 White weathered caliche | OVA - 30 ppm |
| 15.0--16.5 | 9019 | 5-30-35 | | | 15.0-16.5 White dry caliche | OVA - 0 |
| 20.0--21.5 | | 5-14-22 | | | 20.0-20.6 White dry caliche<br>20.6-21.5 Red-gray dry caliche | Augers would not drill beon 22 feet. Too hard |
| 22.0-23.5 | 9020 | 19-28-32 | | | 22.0-23.5 Red-gray dry caliche | |

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DRILLING AND SAMPLING LOG

Project Name and Number: Reese AFB - IRP (DF-2000) Well Casing Size and Type: NA

Site Location: Site 001 Industrial Lake Screen Size and Type: NA

Boring/Well No.: 001-B2 Screened Interval: NA

Drilling Contractor: Environmental Drilling Co. Boring Diameter: 6" Well Diameter: NA

Drilling Equipment: Mobile B-53 - Hollow stem auger Date: 7/29/86 Start Time: 08:48

Driller: Bobby Knopf Geologist: Mike Benner Completion Time: 10:20

Driller's Helper: Eddie Chandler

Total Depth of Hole: 23.0' Groundwater Depth: NA

Completion Depth: NA Surface Elevation: 3300.29

| Depth | Sample | N-blows/6" | Graphic Log | Completion Data | Description | Remarks |
|---|---|---|---|---|---|---|
| 1.0 - 2.5 | 9015 | 3 - 2 - 5 | | NA | 0 - 1.0<br>1.0 - 1.5 Top soil<br>1.5 - 2.5 Tight grey dry clay | 0-1.0' Augered<br>OVA - 0 |
| 5.0 - 6.5 | | 2 - 4 - 6 | | | 6.0 - 5.9 Brown loose top soil<br>5.9 - 6.5 Tight grey dry clay | OVA - 0 |
| 10.0 - 11.5 | | 2 - 4 - 5 | | | 10.0 - 10.2 Grey clay, trace sand.<br>10.2 - 10.9 Dry silt brown top soil.<br>10.9 - 11.0 Tight grey dry clay | OVA - 0 |
| 15.0 - 17.5 | 9016 | 4 - 22 - 23 | | | 15.0 - 15.4 Grey brown dry clay<br>15.4 - 17.5 White stained fine loose silt (caliche) | OVA - 0 |
| 20.0 - 21.5 | | 5 - 8 - 16 | | | 20.0 - 21.5 White / grey fine loose silt (caliche) | OVA - 0 |
| 21.5 - 23.0 | 9017 | 6 - 38 - 50 | | | 21.5 - 23.0 Caliche | Augers would not drill beon 21.5 feet. Too hard |

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 64TH AIR BASE GROUP (ATC)
REESE AIR FORCE BASE TX 79489-5000

23 Oct 86

Ecology and Environment, Inc.
1509 Main St. Suite 814
Dallas, Tx 75201

Dear Mr Benner

The information you requested during your last visit is attached. The well data is based on our real property records and the individual well data sheets on our active wells. When the base reopened in 1956 the existing wells were recorded on the real property records as a single entry. The individual data sheets for our active wells (wells 1, 5, & 8) give the year of completion; the completion years for wells 2,3,4,6 and 7 are estimated based on the completion dates of wells 1,5 and 8. The closure dates are not recorded on the real property records and are not available on any other document. We have a water analysis report dated 1976 for all active wells at that time and have identified closure as before or after that year.

The documentation on the paint trench includes analysis before excavation and analysis during excavation.

If there are any questions regarding this information please call me at 885-3150.

Sincerely

Michael M Keller

MICHAEL M. KELLER, Capt, USAF
Base Environmental Coordinator

5 Atch
1. Well Data Summary
2. Real Property Records
3. Well Data Sheets
4. Paint Shop Trench Analysis
5. Base Layout Plan



AIR FORCE—A GREAT WAY OF LIFE

# REESE AFB WELLS
## SUMMARY DATA

PREPARED: 20 OCT 1986

| WELL # | WHEN DRILLED | ACTIVE/INACTIVE/CLOSED | REMARKS |
|---|---|---|---|
| REESE AFB 1 | 1941 | ACTIVE | LAST WATER TEST 1984 |
| 2 | 1941 | CLOSED | DATE CLOSED UNKNOWN BEFORE 1976 |
| 3 | 1941 | CLOSED | DATE CLOSED UNKNOWN BEFORE 1976 |
| 4 | 1942 | CLOSED | DATE CLOSED UNKNOWN BEFORE 1976 |
| 5 | 1942 | ACTIVE | LAST WATER TEST 1984 |
| 6 | 1944 | CLOSED | DATE CLOSED UNKNOWN AFTER 1976 |
| 7 | 1944 | CLOSED | DATE CLOSED UNKNOWN BEFORE 1976 |
| 8 | 1945 | ACTIVE | LAST WATER TEST 1984 |
| 9 | 1961 | ACTIVE | LAST WATER TEST 1984<br>USED FOR IRRIGATION OF AUTHLETIC FIELDS |
| 10 | 1965 | CLOSED | DATE CLOSED UNKNOWN BEFORE 1976 |
| 11 | 1967 | CLOSED | DATE CLOSED UNKNOWN BEFORE 1976 |
| 12 | 1968 | INACTIVE | NON-POTABLE WATER SITE DEACTIVATED IN 1985 |
| TERRY CO AUX 13 FIELD | 1973 | ACTIVE | FIRE FIGHTING WATER |
| TERRY CO AUX 14 FIELD | 1982 | ACTIVE | POTABLE WATER FOR FIRE DEPT TRAILER TREATED BY HYPOCHLORINATOR |

NOTE: CLOSED WELLS HAVE BEEN CAPPED UNDERGROUND
CLOSURE DATES WERE NOT RECORDED ON REAL PROPERTY RECORDS.

Att. 1

| Pease Air Force Base, Texas<br>INSTALLATION NAME AND NO. | 18 Sep 56<br>DATE | RA 806<br>DRAWING NO. | ~~040010~~ 40046<br>FACILITY NO. | UBNY ~~XXX~~<br>RP ACCOUNT NO. | ~~58040-10 X6410-10~~<br>CONTROL NO. | ~~WTR WATER WELL~~<br>NOMENCLATURE | 03 |
|---|---|---|---|---|---|---|---|

| | | | CODE |
|---|---|---|---|
| TYPE: Water Pumping Plant | CAPACITY: 1,750,000 gallons/day | STATE: TEXAS | ~~48744~~ |
| FUEL USED: Gas - Electricity | POWER SOURCE | ASSIGNMENT: ATC | J |
| SUPPLY SOURCE: Wells | NO. OF PUMPS | CONDITION: Usable | 1 |
| LIFT (Feet) | REFRIGERANT | OCCUPANCY: AF | 1 |
| NO. OF BOILERS | OPERATING PRESSURE | AIR FORCE INTEREST: Owned | 1 |
| NO. OF RETORTS | PRIME MOVER | UNIT OF AREA MEASURE | TD |
| CURRENT CHARACTERISTICS | | QUANTITY | 750 |
| VOLTS | AMPERE | CATEGORY | 841-166 |
| PHASE | CYCLE | REMARKS: See Inventory Card<br>30 Jumbo active (producing) wells are #1 and 4 thru 10<br>Construction Code P | |

| VOUCHER NO. | DATE | DESCRIPTION | DATE COMPLETED | UNIT OF MEASURE TD AMOUNT | UNIT OF MEASURE TD TOTAL | COST AMOUNT | | COST TOTAL | |
|---|---|---|---|---|---|---|---|---|---|
| 25-57 | 18 Sep 56 | Original Wells (1 thru 8) | 1944 | 1,750 | 1,750 | 3,912 | 87 | 3,912 | 87 |
| | | Subsequent improvements through August 1956 | | 0 | 1,750 | 29,261 | 49 | 33,174 | 36 |
| 26-57 | 18 Sep 56 | Transfer of P Property | | 0 | 1,750 | 20,136 | 55 | 53,310 | 91 |
| 190-57 | 8 Mar 57 | Trans Code (08202) 06103 to Code 06103 | | 0 | 1,750 | 2,216 | 50 | 55,527 | 41 |
| 252-57 | 24 Apr 57 | Install Airline to Well #4 | | 0 | 1,750 | 51 | 94 | 55,579 | 35 |
| 118-58 | 19 Sep 57 | Remove Mtr elec fr/well#5 to #4 | | 0 | 1,750 | 610 | 00 | 56,189 | 35 |
| 123-58 | 20 Sep 57 | Conv Wtr Well #8 fr/oil to water | | 0 | 1,750 | 1,544 | 22 | 57,733 | 57 |
| 193-58 | 3 Dec 57 | Electrify Well # 1 | | 0 | 1,750 | 2,668 | 60 | 60,402 | 17 |
| 97-59 | 24 Sep 58 | Repl Chlorinator w/larger unit | | 0 | 1,750 | 344 | 00 | 60,746 | 17 |
| BALANCES FORWARDED | | | | 0 | 1,750 | 0 | | 60,746 | 17 |

AF FORM 15 JUN 56 1433

REAL PROPERTY ACCOUNTABLE RECORD - PLANTS

D-38

Atch 2

| VOUCHER NO. | DATE | DESCRIPTION | DATE COMPLETED | UNIT OF MEASURE | | COST | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | AMOUNT | TOTAL | AMOUNT | | TOTAL | |
| | | BALANCES FORWARDED | | | 1,750 | | | 60,746 | 17 |
| 136-59 | 16 Oct 58 | Addition to Voucher 97-59 | | 0 | 1,750 | 350 | 00 | 61,096 | 17 |
| 182-59 | 11 Dec 58 | Trans Chlorirator to treatmt card | | 0 | 1,750 | 694 | 00 | 60,402 | 17 |
| 132-60 | 9 Nov 59 | ANNUAL INVENTORY | 4 Nov 59 | 0 | 1,750 | | 0 | 60,402 | 17 |
| 256-60 | 25 Apr 60 | Concrete slab around Well #3 | 23 Feb 60 | 0 | 1,750 | 98 | 89 | 60,501 | 06 |
| 151-62 | 9 Nov 61 | Change Code and Nomenclature | 9 Nov 61 | 0 | 1,750 | | 0 | 60,501 | 06 |
| 168-62 | 1 Dec 61 | Construction of Well 3009 | 2 Aug 61 | 288 | 2,038 | 9,497 | 24 | 69,998 | 30 |
| 306-62 | 1 Mar 62 | Change capacity of pumps on Wells 1, 4, 7 from 750 to 350 GPM | 22 Jan 62 | 0 | 2,038 | | 0 | 69,998 | 30 |
| 236-63 | 24 May 63 | Change capacity of pumps on Wells 5 from 750 GPM to 350GPM inst mtr | 25 Apr 63 | 288 | 1,750 | 2,137 | 17 | 72,135 | 47 |
| 216-64 | 3 Jun 64 | Trans pump and motor from 3008 | 3 Jun 64 | 0 | 1,750 | 2,500 | 00 | 74,635 | 47 |
| 68-65 | 21 Sep 64 | Change in capacity of Water Wells | 21 Sep 64 | 1,000 | 750 | | 0 | 74,635 | 47 |
| 87-65 | 2 Nov 64 | Remove Pump from well No 8 & Turn-in to R&M. Relocate Pump from 9to8 | 17 Aug 64 | 108 | 642 | 3,500 | 00 | 71,135 | 47 |
| 139-65 | 17 Mar 65 | Alteration&Activation of Well #10 | 3 Feb 65 | 144 | 786 | 6,469 | 30 | 77,604 | 77 |
| 206-65 | 14 Jun 65 | Replaced [redacted] bowl assy changing capacity of wells #4 &#7, Installed Submersible pumping unit at well #9, Installed Operting-Period Time meter on 4,7,&9. | | 0 | 786 | 4,105 | 76 | 81,710 | 53 |
| 50-66 | 15 Sep 65 | Instl time meters on pumps at wells 99,93,41,531, & 2 in Bldg3. | 9 Apr 65 | 0 | 786 | 279 | 92 | 81,990 | 45 |
| 92-66 | 19 Oct 65 | Instl 200Amp 440 V panel,90 amp breaker,Automatic controls, Const 4'x4'x7' housing for Elec & motor controls & insulate exposed pipe | 24 Mar 65 | 0 | 786 | 256 | 79 | 82,247 | 24 |
| 89-67 | 16 Jan 67 | Construct new well north of Reese Village Well no. 3011 | 16 Nov 66 | 191 | 977 | 4,422 | 27 | 86,669 | 51 |
| 163-68 | 19 Feb 68 | Install battery trickle chargers on Wells #1, 4, and 6. | 29 Jan 68 | 0 | 977 | 271 | 45 | 86,940 | 96 |
| 228-68 | 20 May 68 | Drill 160' well. Well #12. | 20 May 68 | 160 | 1,137 | 1,980 | 32 | 88,921 | 28 |
| 239-68 | 6 June 68 | Adj voucher to 228-68 to capitalize additional cost | 20 May 68 | 0 | 1,137 | 195 | 37 | 89,116 | 65 |
| 55-70 | 2 Oct 69 | Remove engine from well #4 and turn into salvage | 23 Jul 69 | 0 | 1,137 | 360 | 00 | 88,776 | 65 |
| 81-70 | 4 Nov 69 | Pull pumps from wells #4,8,and 10 | 18 Jun 69 | 164 | 973 | 6,165 | 78 | 82,610 | 87 |
| | | BALANCES FORWARDED. Posting to AF 1430 Cards discontinued as of 1 March 74 IAW Hq USAF/PREPA Ltr 01 Jan 1974 | | | 973 | 0 | | 82,610 | 87 |



GPO 900 690

U. S. GOVERNMENT PRINTING OFFICE: 1957 O - 438318

REESE AFB, TEXAS — ~~XXXX~~ UBNY — 16 Jan 67 — ~~8410-10~~ 58040-16 — WATER WELL ~~40010~~ 40046

INSTALLATION NAME AND NO. | DATE | CONTROL NO. | BUILDING NO.

| ASSIGNMENT | OCCUPANCY | CATEGORY CODE | NOMENCLATURE | UNIT OF MEAS. | QUANTITY | UNIT OF AREA | CAPACITY |
|---|---|---|---|---|---|---|---|
| 89-67 | 16 Jan 1967 | ~~Well #11~~ Bldg 3011 | ~~10" Casing 193 GPM Capacity~~ Depth of well 165 ft. Submersible pumping unit, 7½ HP electric motor, 3 phase, 60 cycle, 240 volts, 3450 RPM, to produce ~~193~~ GPH, water meter 4", Sparkling, 6 digit, register quantity in 100 gal units. Fac. 3011 assigned to account for well no. 11 ~~only. No Bldg over well.~~ | ea | | 1 | ~~4,422.27~~ |
| | VO-110-71 | | | | | | |
| 163-68 | 19 Feb 68 | Well 1, ~~4~~ & 6. | Trickle charger, input 120V AC, output 6 V DC. Katolight Battery. | ea | | 1 | 85.00ea |
| | | | Trickle charger, input 120V AC ~~input~~ input. 12 V DC output. Katolight Battery. | ea | | ~~1~~ 1 | 85.00ea |
| 228-68 | 20 May 68 | Well #12 at CCA trailer | 1 ea chemical feeder, Aqua Pure, number ~~55002-02, 0 to 20 gal per day, single~~ phase, 60 cy, 220V. ~~1 ea Fairbank's Morse FM 40 pump, number~~ 4C-10014, 1 HP, 14 stage, 230V, single ~~phase, dischagge pressure is 40 PSI.~~ Casing, 6 5/8" Diameter, 161' deep, 8 ~~GPM .250 wall.~~ 1 ea glass lined pressure tank, 82 gal. ~~Chlorinator & 29 gal solution container.~~ | | 8 GPM | | |
| | | | "Posting to AF 1430 Cards discontinued as of 1 March 74 IAW Hq USAF/PRERA Ltr 11 Jan 1974." | | | | |

Reese AFB, TEXAS — INSTALLATION NAME AND NO.

~~XXXX~~ UBNY

14 June 1965 — DATE

~~8410-10~~ 58040-10 — CONTROL NO.

WATER WELL — BUILDING NO. ~~46010~~ 20046

| ASSIGNMENT | OCCUPANCY | CATEGORY CODE | NOMENCLATURE | UNIT OF MEAS. | QUANTITY | UNIT OF AREA | CAPACITY |
|---|---|---|---|---|---|---|---|
| | | ~~Well # 7~~ Bldg 3007 | ~~12" Casing 175 GPM Capacity~~ Depth of Well 160' | | | | |
| | VQ-110-71 | | Pump Turbine Famona 40HP Ser# 3113 | ea | | 1 | 2,100.00 |
| | | | 175 GPM Mtr Elec W.H. Ser#2141 | ea | | 1 | 450.00 |
| | | | Water-Level Testing Equip, Ashcroft | ea | | 1 | 60.00 |
| | | | ~~Operating-Period Time Meter GE KT-11~~ | ea | | 1 | ~~39.28~~ |
| | | Well # 8 Bldg 3009 Active | 12" Steel Casing W/10' of 16" Casing at top 350 GPM | | | | |
| | | | Depth of well 165' Pump turbine Peerless Ser # 169068 | | | | |
| | | | W/40HP US Motors Elec Motor Ser# 1017227, 500 GPM | ea | | 1 | ~~3,500.00~~ |
| | | Pump Sta Bldg 3 | Pump Booster GE 100 HP 2000 GPM Ser # 5633254 | ea | | 1 | 3,047.00 |
| | | | Pump Booster GE 40 HP 750 GPM Ser # 5605193 | ea | | 1 | 1,241.00 |
| | | | Pump, American 2000 GPM # 65310 | ea | | 1 | |
| | | | Pump American 750 GPM # 65309 | ea | | 1 | |
| | Contractual services Converted engines from gasoline to Natural Gas W/O 3250-4 | | Engine, Climax 100 HP #15833 | ea | | 1 | 1,950.00 |
| | | | Engine Continental Ser 8168, 6 Cyl | ea | | 1 | |
| | | | Speed Reducer, Link Belt #H26284 | ea | | 1 | 250.00 |
| | | | Switch Automatic Float Control Ser #22899, (Disconnected) | ea | | 1 | 75.00 |
| | | | Battery Charger GE # 189048 | ea | | 1 | |
| 1 Dec 61 | 168-62 | Well # 9 Bldg 3009 Active | 16" Casing Depth 160' | | | | |
| | | | Submersible Pumping unit 75 GPM | ea | | 1 | 1,273.68 |
| | | | Motor Electric, 15 HP Fairbanks Morse | ea | | 1 | 534.90 |
| | | | Electric Starter G.E. | ea | | 1 | 91.24 |
| | | | Water-Testing Equip, Ashcroft | ea | | 1 | 60.00 |
| | | | Operating-Period Time Meter G.E KT-11 | ea | | 1 | 39.28 |
| 17 Mar 65 | 139-65 110-71 | ~~Well # 10~~ | ~~12 3/4" Casing, Depth of well 170'~~ Pump, 175 GPM, Deming | | | | |
| | | | Motor, 15 HP Franklin Ser # ~~ST-9700~~ | ea | | 1 | 6,469.30 |
| 15 Sep 65 | 50-66 | | Meter time, GE Type KT Automatic 60 cyc 115 Volts, wells 1, ~~5~~, 6, & ~~7~~. 2 ea in Bldg 3. | ea | | 4 6 | 92.01 ~~138.00~~ |

*Posting to AF 1430 Cards discontinued as of 1 March 74 IAW Hq USAF/PREPA Ltr 11 Jan 1974.*

AF FORM 15 JUN 56 1438

INVENTORY DETAIL - BUILDINGS

☆ U. S. GOVERNMENT PRINTING OFFICE: 1957 O—428672

REESE AFB, TEXAS — UBNY — 14 June 1965 — 58040-10 ~~8410-10~~ — WATER WELL — 40046 ~~40010~~

INSTALLATION NAME AND NO. | DATE | CONTROL NO. | BUILDING NO.

| ASSIGNMENT | OCCUPANCY | CATEGORY CODE | NOMENCLATURE | UNIT OF MEAS. | QUANTITY | UNIT OF AREA | CAPACITY |
|---|---|---|---|---|---|---|---|
| | | Well # 1 Bldg 99 | 12" Steel Casing, ~~400~~ 350 GPM Capacity Depth of well 157½' | | | | |
| | | Active | Pump, Turbine, Pamona 350 GPM, 40 HP Ser # 3115 | ea | 1 | | 2,100.00 |
| | | | Motor GE, 40 HP Ser # 613020 | ea | 1 | | 992.12 |
| | | | Right Angle Pump Drive, Amarillo, 52 HP Ser # 870 | ea | 1 | | |
| | VO - | | ~~Engine, Continental Ser #11969 Stand-by~~ | ~~1~~ | | | |
| | | Well # 2 - Bldg 38 | ~~12" Steel Casing 300 GPM Capacity Not Known Depth of Well 155½'~~ | | | | |
| | | Well # 3 - | Well Capped | | | | |
| | | | ~~12" Steel Casing 300 GPM Capacity~~ Depth of Well Well Capped | | | | |
| | VO-110-71 | ~~Well # 4 Bldg 41~~ | ~~12" Steel Casing, 250 GPM Capacity Depth of Well 161'~~ | | | | |
| | | | ~~Pump, turbine, Pamona, 250 GPM Ser # SA 2614~~ | ~~ea~~ | ~~1~~ | | ~~2,100.00~~ |
| | | | Motor, Elec Westinghouse, 40 HP Ser # 1341 | ea | 1 | | 450.00 |
| | | | Right Angle Pump Drive, Amarillo, 52 HP Ser # 777 | ea | 1 | | |
| | | | ~~Engine Chrysler, 6 cyl ser#61614 Stand by~~ | ~~1~~ | | | ~~340.00~~ |
| | | | Liquidometer, Type PA, Ser # 7199 | ea | 1 | | 17.50 |
| | | | Water-Level Testing Equip Ashcroft | ea | 1 | | 60.00 |
| | | Active | ~~Operating Period Time Meter GE KT-11~~ | ~~ea~~ | ~~1~~ | | ~~38.28~~ |
| | | Well # 5 Bldg 93 | 12 " Steel Casing, 350 GPM Capacity Depth of well 159' 25 HP Elec Mtr | | | | |
| | | Well # 6 Bldg 531 | Pump, Turbine, Pamona Ser # 3114 24" Casing Cemented 500 GPM Capacity | ea | 1 | | 2,100.00 |
| | | Active | Depth of Well 151' 500 GPM Pump Turbine, Layne 50HP Ser#23537 | ea | 1 | | |
| | | | Right Angle Pump Drive, Amarillo, 50 HP Ser # 17390 | ea | 1 | | |
| | | | Motor Elec, US Motors 20 HP Ser # 2110134 | ea | 1 | | |
| | | | Power take off, Rockford Ser # 184313 | ea | 1 | | |
| | | | Engine Continental Ser #10319 Stand by | ea | 1 | | 1,438.25 |
| | "Posting to AF 1430 Cards discontinued as of 1 March 74 IAW Hq USAF/PREPA Ltr 11 | | | | | | |

AF FORM 15 JUN 56 1438 — INVENTORY DETAIL - BUILDINGS — ☆ U. S. GOVERNMENT PRINTING OFFICE: 1957 O—428672

# TERRY COUNTY WELLS 13 & 14

| LOCATION | DATE INSTALLED | DEPTH CASING | STATIC WATER | CASING TYPE | SCREENING | PUMP INFO. |
|---|---|---|---|---|---|---|
| #13 TERRY CO NEXT TO FIRE TRAINING BARN | 1973 | 160' | U.K. ≅ 135' TO 140' | STEEL 5" Φ | PUMP IS SCREENED & PERFORATED CASING & GRAVEL PACKED | 5 H.P. PUMP SET @ 150' INSTALLED 1979 100 GPM WEEKLY |
| #14 NEXT TO TRAILOR TERRY CO. | 1982 DOMESTIC WELL | U.K. ≅ 155' | U.K. ≅ 135' TO 140' | PLASTIC CASING 5" Φ | PUMP SCREENED & PERFORATED CASING & GRAVEL PACKED | HAS A CHLORINATOR 3/4 H.P SUB. PUMP 50 GPM USED DAILY |

5 February 1959

WELL DATA

AFM 85-13

| WELL DATA | | | INSTALLATION | | WELL NO. |
|---|---|---|---|---|---|
| | | | REESE AFB TEX | | 1 |
| ELEVATION (Ft) | LOCATION | | | DATE CONSTR ENDED | |
| 3338 | LUBBOCK COUNTY | | | 1941 | |
| WELL TYPE | DRILLED | | | | |
| DEPTH | 157 FT. | DIAMETER | 24" | PUMPSETTING DEPTH | 150 FT |
| ORIG STATIC WATER LEVEL | 130.4 FT | DRAWDOWN | 22.6 FT | RECOVERY TIME | 1 HR |

| TEST DATA | | AIR LINES AND GAGES | | | | SPECIFIC CAPACITY (Gal per ft) | | |
|---|---|---|---|---|---|---|---|---|
| Well capacity | Pumping level | Yes | | No | Length | GPM / DRAWDOWN | 250 / 22.6 | 11.06 gpm/ft |
| | 153 | | | | | | | |

WELL PUMPING EQUIPMENT

| PUMP | | | | | |
|---|---|---|---|---|---|
| TYPE AND MAKE | POMONA TURBINE. | | | | CAPACITY 250 |
| SUCTION (Ft) | SIZE AND LENGTH | COLUMN 8 in steel | | | |
| HEAD: Above grnd 47 | Below grnd 153 | Total 200 | NUMBER BOWLS 8 | SIZE AND TYPE Closed 6" | NO. STAGES 8 |

| MOTOR | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SERIAL NO. | TYPE | MAKE | HP | RPM | FRAME | PHASE | CYCLES | VOLTAGE | |
| 613020 | GA | GE | 40 | 1765 | 404VY | 3 | 60 | 220/440 | |
| STANDBY POWER | | MAKE | | | | | | SIZE | |
| Yes | | RED SEAL CONTINENTAL | | | | | | 50 | |
| HP | RPM | DESCRIPTION | | | | | | | |
| 50 | 1760 | | | | | | | | |

| CASING AND WELL SCREENING MATERIAL USED | SETTING DEPTH | LENGTH EACH |
|---|---|---|
| Steel 15" casing | | 10 FT. |
| screen - torchcut slots | | |
| 1 ft. long 1/4" wide | | |
| spaced at 90° | | |
| and offset 6 in | | |
| gravel packed | | |

AF FORM 996, AUG 58 — Page 1 of 2 Pages

Figure 27. AF Form 996, Well Data (Front).

Atch 3

| WELL DATA | | | INSTALLATION: REESE AFB Tex. | | WELL NO.: 5 |
|---|---|---|---|---|---|
| ELEVATION (Ft): 3338 | LOCATION: Lubbock County | | | | DATE CONSTR ENDED: 1942 |
| WELL — TYPE: DRILLED | | | | | |
| WELL — DEPTH: 159' | DIAMETER: 24" | | PUMP SETTING DEPTH: 150' | | |
| WELL — ORIG STATIC WATER LEVEL: 132.7 | DRAWDOWN: 20.3" | | RECOVERY TIME: 1HR | | |
| TEST DATA: Well capacity: 350-100 | Pumping level: 150 | AIR LINES AND GAGES: Yes / No / Length | SPECIFIC CAPACITY (Gal per ft): GPM 100 / DRAWDOWN 20.3 FT = 493.8 gpm/ft | | |
| WELL PUMPING EQUIPMENT | | | | | |
| PUMP — TYPE AND MAKE: TURBINE POMONA | | | | | CAPACITY: 100 |
| PUMP — SUCTION (Ft): 150 | SIZE AND LENGTH: 6" | COLUMN: 8" Steel | | | |
| PUMP — HEAD: Above grnd: 41 | Below grnd: 159 | Total: 200 | NUMBER BOWLS: 8 | SIZE AND TYPE: 6" CLOSED | NO. STAGES: 8 |
| MOTOR — SERIAL NO.: 417603 | TYPE: KZKV-3 | MAKE: F-M | HP: 25 | RPM: 1465 | FRAME: | PHASE: 3 | CYCLES: 60 | VOLTAGE: 220-440 |
| MOTOR — STANDBY POWER | | MAKE | | | | | | SIZE |
| MOTOR — HP | RPM | DESCRIPTION | | | | | | |

| CASING AND WELL SCREENING MATERIAL USED | SETTING DEPTH | LENGTH EACH |
|---|---|---|
| Steel - same as well #1 | | 10FT |

AF FORM 996, AUG 58 Page 1 of 2 Pages

Figure 27. AF Form 996, Well Data (Front).

| WELL DATA | | | INSTALLATION Reese AFB Tex | | WELL NO. 8 |
|---|---|---|---|---|---|
| ELEVATION (Ft) 3378 | LOCATION Lubbock County | | | | DATE CONSTR ENDED 1945 |
| WELL TYPE DRILLED | | | | | |
| WELL DEPTH 165 FT | DIAMETER 24" | | PUMPSETTING DEPTH 159 FT | | |
| WELL ORIG STATIC WATER LEVEL 135 FT | DRAWDOWN 20 FT | | RECOVERY TIME 1 HR | | |
| TEST DATA: Well capacity 120 | Pumping level 155 FT | AIR LINES AND GAGES: Yes ✓ | No | Length 158 FT | SPECIFIC CAPACITY (Gal per ft) GPM 100 DRAWDOWN 20 FT |
| WELL PUMPING EQUIPMENT | | | | | |
| PUMP TYPE AND MAKE ~~Peerless~~ TURBINE SUBMERSIBLE | | | | | CAPACITY 100 |
| PUMP SUCTION (Ft) 158 | SIZE AND LENGTH 4" | | COLUMN Steel | | |
| PUMP HEAD: Above grnd 40 | Below grnd 160 | Total 200 | NUMBER BOWLS 6 | SIZE AND TYPE 5" | NO. STAGES 6 |
| MOTOR SERIAL NO. JT9709 | TYPE SUB | MAKE FRANKLIN | HP 15 | RPM 1100 | FRAME |
| MOTOR PHASE 60 | CYCLES 60 | VOLTAGE 220-440 | | | |
| MOTOR STANDBY POWER NO | MAKE | | SIZE | | |
| MOTOR HP | RPM | DESCRIPTION | | | |

| CASING AND WELL SCREENING MATERIAL USED | SETTING DEPTH | LENGTH EACH |
|---|---|---|
| Steel 4" column | | 10 FT. |
| 15" steel casing - same as well #1 | | |

AF FORM 996, AUG 58 Page 1 of 2 Pages

Figure 27. AF Form 996, Well Data (Front).

| WELL DATA | INSTALLATION Reese AFB Tex | WELL NO. 9 |
|---|---|---|
| ELEVATION (Ft) 3338 | LOCATION Lubbock County | DATE CONSTR ENDED 1959 |

**WELL**

| TYPE | | |
|---|---|---|
| DRILLED | | |
| DEPTH 162 FT | DIAMETER 16" | PUMPSETTING DEPTH 158 FT. |
| ORIG STATIC WATER LEVEL 121 FT | DRAWDOWN 23 FT | RECOVERY TIME 2 HRS |

| TEST DATA | | AIR LINES AND GAGES | | | | SPECIFIC CAPACITY (Gal per ft) |
|---|---|---|---|---|---|---|
| Well capacity | Pumping level | Yes | | No | Length | GPM 50 / DRAWDOWN 23FT = 2.17 GPM/ft |
| 50 | 144 FT | ✓ | | | 158 | |

**WELL PUMPING EQUIPMENT**

**PUMP**

| TYPE AND MAKE | | | CAPACITY |
|---|---|---|---|
| SUBMERSIBLE FAIRBANKS MORSE | | | 100 |
| SUCTION (Ft) 158 | SIZE AND LENGTH 4 in | COLUMN STEEL | |

| HEAD | | | NUMBER BOWLS | SIZE AND TYPE | NO. STAGES |
|---|---|---|---|---|---|
| Above grnd 42 | Below grnd 108 | Total 200 | 6 | 4" | 6 |

**MOTOR**

| SERIAL NO. | TYPE | MAKE | HP | RPM | FRAME | PHASE | CYCLES | VOLTAGE |
|---|---|---|---|---|---|---|---|---|
| | | FM | 15 | 1100 | | | 60 | 220-440 |

| STANDBY POWER | MAKE | SIZE |
|---|---|---|
| NO | | |

| HP | RPM | DESCRIPTION |
|---|---|---|
| | | |

| CASING AND WELL SCREENING MATERIAL USED | SETTING DEPTH | LENGTH EACH |
|---|---|---|
| STEEL 4" | | 10 FT. |
| 16" steel casing | | |
| screen — 8" long 3/16" mill cut slots | | |

AF FORM 996, AUG 58 Page 1 of 2 Pages

Figure 27. AF Form 996, Well Data (Front).

| WELL DATA | INSTALLATION | WELL NO. |
|---|---|---|
| | Reese AFB Tex | 12 |

| ELEVATION (Ft) | LOCATION | DATE CONSTR ENDED |
|---|---|---|
| 3,338 | Lubbock County | 1968 |

**WELL**

| TYPE | | |
|---|---|---|
| DRILLED | | |
| DEPTH | DIAMETER | PUMPSETTING DEPTH |
| 161 FT | 12 IN | 155 |
| ORIG STATIC WATER LEVEL | DRAWDOWN | RECOVERY TIME |
| 130 FT | 20 | 2 HRS |

| TEST DATA | | AIR LINES AND GAGES | | | SPECIFIC CAPACITY (Gal per Hr) |
|---|---|---|---|---|---|
| Well capacity | Pumping level | Yes | No | Length | GPM 8 / DRAWDOWN 20 |
| 8 | 150 | | | | |

4 GPM / Ft

**WELL PUMPING EQUIPMENT**

**PUMP**

| TYPE AND MAKE | | | CAPACITY |
|---|---|---|---|
| SUBMERSIBLE FAIRBANK & MORSE | | | 8 |
| SUCTION (Ft) | SIZE AND LENGTH | COLUMN | |
| 155 | 4 IN | Steel | |

| HEAD | | | NUMBER BOWLS | SIZE AND TYPE | NO. STAGES |
|---|---|---|---|---|---|
| Above grnd | Below grnd | Total | | | |
| -10 | 140 | 150 | | | 14 |

**MOTOR**

| SERIAL NO. | TYPE | MAKE | HP | RPM | FRAME | PHASE | CYCLES | VOLTAGE |
|---|---|---|---|---|---|---|---|---|
| 4C-10014 | FM 40 | FM | 1 | 1100 | | Single | 60 | 220 |

| STANDBY POWER | MAKE | SIZE |
|---|---|---|
| NO | | |

| HP | RPM | DESCRIPTION |
|---|---|---|
| | | |

| CASING AND WELL SCREENING MATERIAL USED | SETTING DEPTH | LENGTH EACH |
|---|---|---|
| STEEL | | 10 FT |

well at GCA facility

AF FORM 996, AUG 58 Page 1 of 2 Pages

Figure 27. AF Form 996, Well Data (Front).

| WELL DATA | | | INSTALLATION Reese AFB Tex | | WELL NO. 13 |
|---|---|---|---|---|---|
| ELEVATION (Ft) | LOCATION Terry County | | | | DATE CONSTR ENDED 1973 |
| WELL TYPE Drilled | | | | | |
| WELL DEPTH 160 FT | DIAMETER 5 IN | | PUMPSETTING DEPTH 150 FT | | |
| WELL ORIG STATIC WATER LEVEL 140 FT | DRAWDOWN 20 FT | | RECOVERY TIME 1 HR | | |
| TEST DATA: Well capacity 75 | Pumping level 155 | AIR LINES AND GAGES: Yes ✓ No | Length 150 | SPECIFIC CAPACITY (Gal per ft) GPM 75 / DRAWDOWN 20 = 3.75 GPM/Ft | |
| WELL PUMPING EQUIPMENT | | | | | |
| PUMP TYPE AND MAKE Turbine Peerless | | | | | CAPACITY 75 |
| PUMP SUCTION (Ft) 150 | SIZE AND LENGTH 4 IN | | COLUMN Steel | | |
| PUMP HEAD: Above grnd 10 | Below grnd 140 | Total 150 | NUMBER BOWLS 6 | SIZE AND TYPE 4 IN | NO. STAGES 6 |
| MOTOR SERIAL NO. 2969431 | TYPE Hur | MAKE Hollcshaw | HP 3 | RPM 1800 | FRAME 215P | PHASE 1 | CYCLES 60 | VOLTAGE 115/230 |
| MOTOR STANDBY POWER NO | MAKE | | | | | | | SIZE |
| MOTOR HP | RPM | DESCRIPTION | | | | | | |

| CASING AND WELL SCREENING MATERIAL USED | SETTING DEPTH | LENGTH EACH |
|---|---|---|
| Steel | | 10 FT |

AF FORM 996, AUG 58 Page 1 of 2 Pages

Figure 27. AF Form 996, Well Data (Front).

# APPENDIX E

## LOCATION AND ELEVATION SURVEY FIELD DATA

******* FIELD TRAVERSE *******

| LEG FROM | | ANGLE / BEARING | S.DIST / H.DIST | ZENITH / V.DIST | H.I. | H.T. | TO | NORTHING | EASTING | ELEVATION |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NW 2 23 30.00 REF BRG | | | | | | | | |
| | | | | | | | 11 | 732,590.6100 | 620,284.0800 | |
| 1 | 11 | AR 184 30 00.00 | | | | | | | | |
| | | SW 2 06 30.00 | 2702.6000 | | | | 1 | 729,889.8395 | 620,184.6539 | |
| 2 | 1 | AR 135 04 06.00 | | | | | | | | |
| | | SE 42 49 24.00 | 1324.8700 | | | | 2 | 728,918.1095 | 621,085.2211 | |
| 3 | 2 | AR 177 41 02.00 | | | | | | | | |
| | | SE 45 08 22.00 | 725.0300 | | | | 3 | 728,406.6851 | 621,599.1409 | |
| 4 | 3 | AR 274 15 39.00 | | | | | | | | |
| | | SW 49 07 17.00 | 1156.2500 | | | | 4 | 727,649.9674 | 620,724.9028 | |
| 5 | 4 | AR 174 24 01.00 | | | | | | | | |
| | | SW 43 31 18.00 | 1660.7800 | | | | 5 | 726,445.7125 | 619,581.2418 | |
| 6 | 5 | AR 148 18 09.00 | | | | | | | | |
| | | SW 11 49 27.00 | 2134.9200 | | | | 6 | 724,356.0933 | 619,143.7777 | |
| 7 | 6 | AR 278 26 25.00 | | | | | | | | |
| | | NW 69 44 08.00 | 2350.9600 | | | | 7 | 725,170.3566 | 616,938.3326 | |
| 8 | 7 | AR 191 08 08.00 | | | | | | | | |
| | | NW 58 36 00.00 | 4846.3600 | | | | 8 | 727,695.3569 | 612,801.7182 | |
| 9 | 8 | AR 250 06 00.00 | | | | | | | | |
| | | NE 11 30 00.00 | 8255.6300 | | | | 9 | 735,785.2527 | 614,447.6261 | |
| 10 | 9 | AR 285 09 30.00 | | | | | | | | |
| | | SE 63 20 30.00 | 6517.3800 | | | | 10 | 732,861.1050 | 620,272.1949 | |
| 11 | 10 | AR 240 57 06.00 | | | | | | | | |
| | | SE 2 23 24.00 | 269.8200 | | | | 12 | 732,591.5197 | 620,283.4468 | |
| 12 | 12 | AR 184 30 00.00 | | | | | | | | |
| | | SW 2 06 36.00 | 0.0000 | | | | 13 | 732,591.5197 | 620,283.4468 | |
| | | | | | | | CLOSING PT: | 732,590.6100 | 620,284.0800 | |
| | | SW 2 06 30.00 REF BRG | | | | | | | | |
| | | 0 00 06.00 ANG ERROR | | | | | | | | |
| | | 0 00 00.00 ANG BALANCE | | | | | | | | |

HORIZONTAL CLOSURE
SE 34 50 28.16
1.1084 CLOSING LINE
31,944.6000 DIST TRAV
28,820.5308 PRECISION

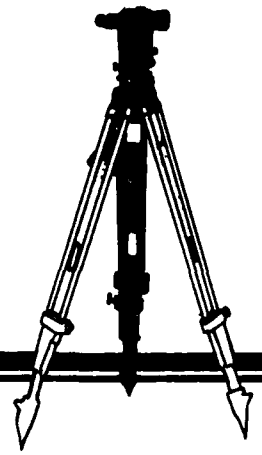
COMPASS ADJUSTMENT

| LEG FROM | | ANGLE / BEARING | S.DIST / H.DIST | ZENITH / V.DIST | H.I. | H.T. | TO | NORTHING | EASTING | ELEVATION |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 11 | 732,590.6100 | 620,284.0800 | |
| 1 | 11 | SW 2 06 25.70 | 2702.6749 | | | | 1 | 729,889.7626 | 620,184.7075 | |
| 2 | 1 | SE 42 49 23.01 | 1324.9155 | | | | 2 | 728,917.9948 | 621,085.3009 | |
| 3 | 2 | SE 45 08 20.72 | 725.0548 | | | | 3 | 728,406.5498 | 621,599.2352 | |
| 4 | 3 | SW 49 07 09.88 | 1156.2542 | | | | 4 | 727,649.7991 | 620,725.0200 | |
| 5 | 4 | SW 43 31 10.99 | 1660.7916 | | | | 5 | 726,445.4969 | 619,581.3919 | |
| 6 | 5 | SW 11 49 21.79 | 2134.9708 | | | | 6 | 724,355.8169 | 619,143.9701 | |
| 7 | 6 | NW 69 44 12.09 | 2350.8931 | | | | 7 | 725,170.0133 | 616,938.5716 | |
| 8 | 7 | NW 58 36 02.88 | 4846.2061 | | | | 8 | 727,694.8756 | 612,802.0532 | |
| 9 | 8 | NE 11 30 05.18 | 8255.4322 | | | | 9 | 735,784.5363 | 614,448.1248 | |
| 10 | 9 | SE 63 20 26.59 | 6517.5787 | | | | 10 | 732,860.2030 | 620,272.8228 | |
| 11 | 10 | SE 2 23 27.84 | 269.8279 | | | | 12 | 732,590.6100 | 620,284.0800 | |
| 12 | 12 | NE 0 00 00.00 | 0.0000 | | | | 13 | 732,590.6100 | 620,284.0800 | |

AREA 60142416.00 SF 1380.6799 ACRES



TEMPORARY DATA SAVED



# WILSON SURVEYING CO., INC

REGISTERED LAND SURVEYORS
TEXAS • NEW MEXICO • ARIZONA

## REESE AIR FORCE BASE
## WATER WELLS, BORINGS AND WATER SAMPLE POINTS

| DESCRIPTION | LATITUDE | LONGITUDE |
|---|---|---|
| B1 | 33°35'31.588" | 102°01'51.068" |
| B2 | 33°35'30.572" | 102°01'53.092" |
| B3 | 33°35'29.412" | 102°01'54.731" |
| B4 | 33°35'28.257" | 102°01'56.143" |
| B5 | 33°35'26.964" | 102°01'53.945" |
| B6 | 33°35'27.886" | 102°01'54.176" |
| B7 | 33°35'27.900" | 102°01'53.178" |
| B8 | 33°35'28.605" | 102°01'53.238" |
| B9 | 33°35'28.425" | 102°01'52.305" |
| B10 | 33°35'30.544" | 102°01'51.015" |
| 005-W1 TOP PVC PIPE | 33°35'16.898" | 102°01'48.321" |
| 001-9003 | 33°35'15.435" | 102°01'34.494" |
| 001-B1 | 33°35'15.599" | 102°01'38.583" |
| 001-B2 | 33°35'14.513" | 102°01'38.555" |
| 001-9001 | 33°35'13.861" | 102°01'38.918" |
| INLET DELTA | 33°35'12.557" | 102°01'39.156" |
| 001-B3 | 33°35'11.346" | 102°01'38.700" |
| 001-9005 | 33°35'10.682" | 102°01'36.897" |
| 001-9007 | 33°35'10.990" | 102°01'35.248" |
| 001-W1 TOP PVC PIPE | 33°35'11.013" | 102°01'35.024" |
| 003-B1 | 33°35'10.664" | 102°01'59.968" |
| 003-B2 | 33°35'11.575" | 102°02'00.304" |
| 003-B3 | 33°35'11.030" | 102°01'58.266" |
| 003-B4 | 33°35'10.164" | 102°01'58.203" |
| 001-9004 | 33°35'02.882" | 102°01'43.778" |
| 002-W1 TOP PVC PIPE | 33°34'45.963" | 102°01'45.935" |
| 002-9027 | 33°34'49.751" | 102°01'47.334" |
| 002-9029 | 33°34'53.053" | 102°01'47.130" |
| 002-9025 | 33°34'54.569" | 102°01'47.715" |
| 002-9030 | 33°34'53.890" | 102°01'53.910" |
| 002-9026 | 33°34'53.166" | 102°01'54.871" |
| 002-B1 | 33°34'53.167" | 102°01'56.106" |
| 002-B2 | 33°34'49.214" | 102°01'59.732" |
| 002-B3 | 33°34'46.524" | 102°01'59.419" |
| 008-W1 TOP CONC BASE | 33°34'22.234" | 102°02'17.665" |
| 008-W2 TOP WELL SLAB | 33°34'31.280" | 102°02'13.858" |

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| | | |
|---|---|---|
| 008-W3 TOP CONC BASE | 33°34'36.750" | 102°02'06.448" |
| 008-W4 TOP WELL SLAB | 33°34'35.317" | 102°02'34.829" |
| 008-W5 TOP WELL SLAB | 33°34'38.896" | 102°02'34.664" |
| 008-B1 | 33°34'29.180" | 102°02'05.718" |
| 008-B2 | 33°34'32.994" | 102°02'10.131" |
| 004-W1 TOP PVC PIPE | 33°34'59.419" | 102°03'21.862" |
| 004-B1 | 33°35'06.271" | 102°03'23.718" |
| 004-B2 | 33°35'08.269" | 102°03'16.511" |
| 004-B3 | 33°35'04.354" | 102°03'11.945" |
| 006-B1 | 33°35'11.453" | 102°02'59.344" |
| 006-B2 | 33°35'13.755" | 102°03'03.634" |
| 006-9047 | 33°35'14.253" | 102°02'58.119" |
| 006-9048 | 33°35'14.259" | 102°02'56.904" |
| 007-B1 | 33°36'59.423" | 102°03'06.279" |
| 007-B2 | 33°36'59.464" | 102°03'07.848" |
| 007-B3 | 33°36'54.557" | 102°03'06.139" |
| 007-B4 | 33°36'55.914" | 102°03'07.942" |
| PT #1 | 33°35'18.721" | 102°01'45.671" |
| PT #2 | 33°35'13.885" | 102°01'39.341" |
| PT #3 | 33°35'06.031" | 102°01'49.280" |
| PT #4 | 33°34'53.639" | 102°02'02.172" |
| PT #5 | 33°34'32.769" | 102°02'06.271" |
| PT #6 | 33°34'39.902" | 102°02'32.730" |
| PT #7 | 33°35'03.088" | 102°03'22.871" |
| PT #8 | 33°36'23.758" | 102°03'07.574" |
| PT #9 | 33°35'57.343" | 102°01'57.277" |
| PT #10 | 33°35'06.192" | 102°03'12.771" |
| PT #11 | 33°36'49.110" | 102°03'06.501" |
| PT #12 | 33°36'19.435" | 102°02'56.066" |
| PI #18 MONUMENT | 33°35'27.943" | 102°01'56.803" |
| PI #20 MONUMENT | 33°35'54.683" | 102°01°57.006" |

P.S. # 3

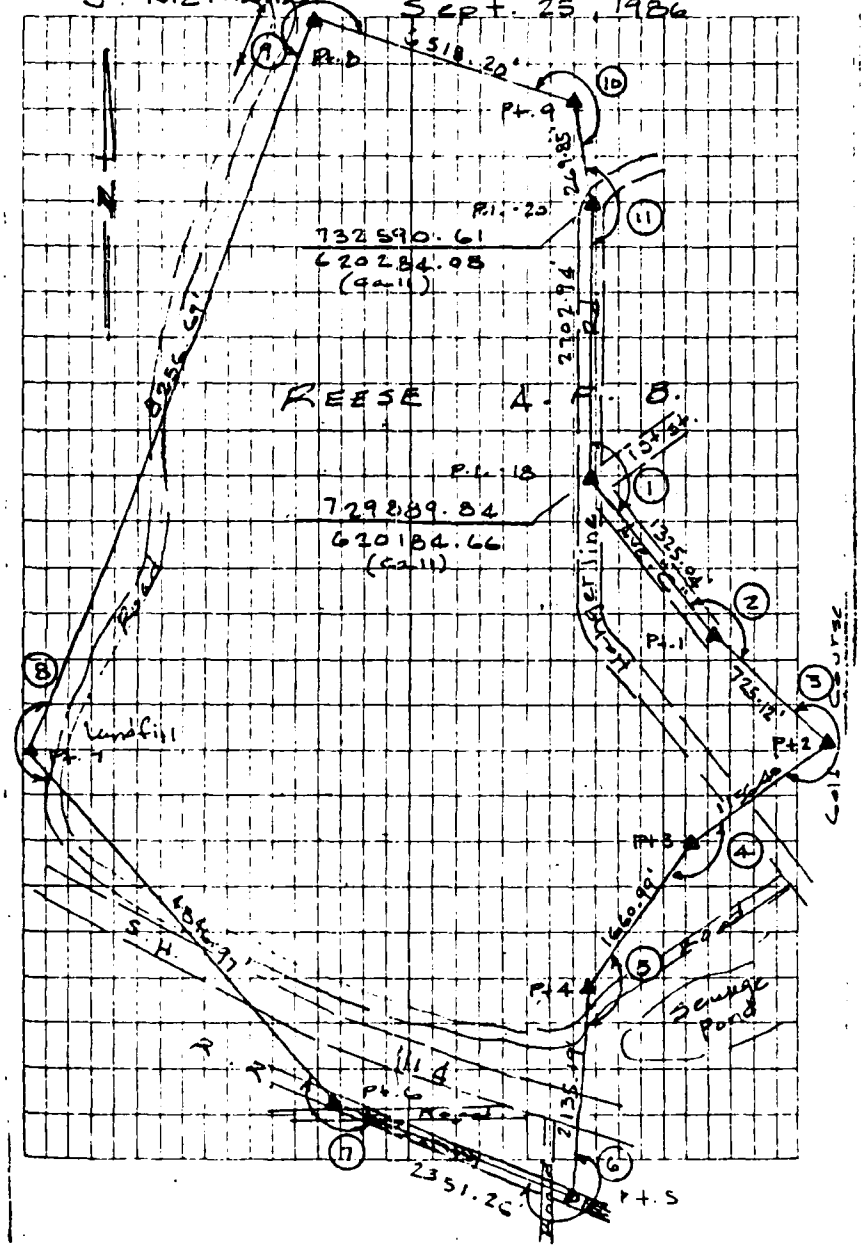
Ecology & Environment Inc.

Horizontal and vertical ties to Wells, Boring, and Sample Spots on Reese Airforce Base

| | | initial reading | end reading | |
|---|---|---|---|---|
| ① | | | | |
| direct | 1) | 0-00 | 135-04-04 | |
| | 2) | 33-13-51 | 168-17-56 | |
| close | 1) | 0-00 | 224-55-55 | Avg.: 135-04-06 |
| | 2) | 319-48-11 | 184-44-02 | |
| S. Dist. Pt. 1 to Pt. 1 = 1325.06' (403.881m) V= | | | | 269-41-17 90-18-58 |
| ② | | | | |
| direct | 1) | 0-00 | 177-41-03 | |
| | 2) | 28-45-47 | 206-26-46 | |
| close | 1) | 0-00 | 182-18-59 | Avg.: 177-41-02 |
| | 2) | 330-47-01 | 153-06-03 | |
| S. Dist Pt 1 to Pt. 2 = 725.27' (221.063m) V= | | | | 268-49-49 91-10-42 |
| ③ | | | | |
| direct | 1) | 0-00 | 274-15-38 | |
| | 2) | 23-16-03 | 297-31-43 | Avg. 274-15-39 |
| close | 1) | 0-00 | 85-44-20 | |
| | 2) | 28-46-49 | 114-31-10 | |
| S. Dist. Pt. 2 to Pt 3 = 1156.56 (352.523m) V= | | | | 270-56-48 89-03-09 |

L. Drengel
G. McMahan
J. McMahan

Sept. 25, 1986



James Sept. 25, 1986

(CONT.)

| | | initial reading | end reading | |
|---|---|---|---|---|
| ④ | | | | |
| direct | 1) | 0-00 | 174-24-03 | |
| | 2) | 18-32-45 | 192-56-46 | |
| close | 1) | 0-00 | 185-36-01 | Avg. = 174-24-01 |
| | 2) | 319-16-30 | 144-52-20 | |
| S. Dist. | Pt 3 to Pt 4 = 1661.10' (506.304 m) | | | v = 269-20-05 / 90-39-50 |
| ⑤ | | | | |
| direct | 1) | 0-00 | 148-18-10 | |
| | 2) | 21-38-04 | 169-56-12 | |
| close | 1) | 0-00 | 211-41-48 | Avg. = 148-18-09 |
| | 2) | 340-13-05 | 191-54-58 | |
| S. Dist. | Pt 4 to Pt 5 = 2135.21' (650.816m) | | | v = 270-13-49 / 89-46-24 |
| ⑥ | | | | |
| direct | 1) | 0-00 | 278-26-25 | |
| | 2) | 27-22-15 | 305-48-38 | |
| close | 1) | 0-00 | 81-33-32 | Avg. = 278-26-25 |
| | 2) | 322-51-45 | 44-25-21 | |
| S. Dist. | Pt 5 to Pt 6 = 2351.27 (716.670m) | | | v = 270-11-02 / 89-48-58 |
| ⑦ | | | | |
| | 1) | 0-00 | 191-08-08 | |
| | 2) | 31-20-27 | 222-28-37 | |
| | 1) | 0-00 | 168-51-55 | Avg. = 191-08-08 |
| | 2) | 321-49-05 | 130-40-57 | |
| S. Dist. | Pt 6 to Pt 7 = 4847.00' (1477.371m) | | | v = 270-13-13 / 89-47-17 |

E-3

Same Sept. 25, 1986

(CONT.)

| | | initial reading | | end reading | | |
|---|---|---|---|---|---|---|
| ⑨ | | | | | | |
| direct | 1) | 0-00 | | 285-09-33 | | |
| | 2) | 18-00-30 | | 303-10-00 | Avg. = | 285-09-30 |
| close | 1) | 0-00 | | 74-50-32 | | |
| | 2) | 38-52-28 | | 113-42-54 | | |
| S. Dist | Pt. 8 to Pt. 9 = 6518.19' (1986.752m) V = | | | | | 269-57-23 90-03-01 |
| ⑩ | | | | | | |
| direct | 1) | 0-00 | | 240-57-05 | | |
| | 2) | +1-41-59 | | 282-38-59 | | |
| close | 1) | 0-00 | | 119-02-53 | Avg. | 240-51-06 |
| | 2) | 20-10-36 | | 139-13-30 | | |
| S. Dist. | Pt. 9 to Pt. 20 = 269.06 (82.254m) V. = | | | | | 269-38-22 90-21-58 |
| ⑪ | | | | | | |
| direct | 1) | 0-00 | | 184-29-59 | | |
| | 2) | 59-34-27 | | 244-03-42 | | |
| close | 1) | 0-00 | | 175-30-39 | | (184-30-00) |
| | 2) | 22-17-53 | | 197-47-52 | | |
| S. Dist | Pt. 20 to Pt. 18 = 2702.95 (823.862m) V | | | | | 270-07-35 |

(CONT.)

(See P. 20 for points)

Same — Sept. 26, 1986

| T | @ | Pt. 5 | B.S. | Pt. 6 | | | |
|---|---|---|---|---|---|---|---|
| Sta | | Hor ∠ initial reading | Hor ∠ end reading | Dist Ft | Dist M | Vert ∠ | |
| 008-W33 (well) | 1) | 0-00 | 70-04-02 | 393.44' | 121.897m | 272-01-52 | |
| | 2) | 30-21-41 | 100-25-44 | H = 349.93' | | | |
| | | Avg = 70-04-08 | | | | | |
| 008-R1 (bore) | 1) | 0-00 | 244-54-48 | 368.51' | 112.333 | 268-51-01 | |
| | 2) | 16-36-34 | 261-27-18 | H = 368.46' | | | |
| | | Avg = 244-54-48 | | | | | |
| 008-R2 | 1) | 0-00 | 345-43-34 | 327.20' | 99.741 | 269-54-07 | |
| | 2) | 34-17-52 | 20-01-28 | H = 327.22' | | | |
| | | Avg = 345-43-38 | | | | | |
| 008-W02 | 1) | 0-00 | 328-47-18 | 659.95' | 201.174 | 270-22-07 | |
| | 2) | 10-35-19 | 339-12-33 | H = 659.91' | | | |
| | | Avg = 328-47-16 | | | | | |
| 008-W01 | 1) | 0-00 | 294-17-41 | 1438.57 | 438.460 | 270-13-05 | |
| | 2) | 51-40-37 | 345-58-12 | Avg = 294-17-38 | | H = 1438.52' | |
| T | @ | Pt. 4 | B.S. | Pt. 5 | | | |
| 008-W35 | 1) | 0-00 | 130-20-56 | 192.68 | 58.726 | 270-03-41 | |
| | 2) | 61-27-56 | 191-48-51 | H = 192.64' | | | |
| | | Avg = 190-20-56 | | | | | |
| 008-W34 | 1) | 0-00 | 93-11-15 | 496.34' | 151.360 | 269-58-25 | |
| | 2) | 23-47-51 | 116-59-01 | H = 496.30' | | | |
| | | Avg = 93-11-14 | | | | | |

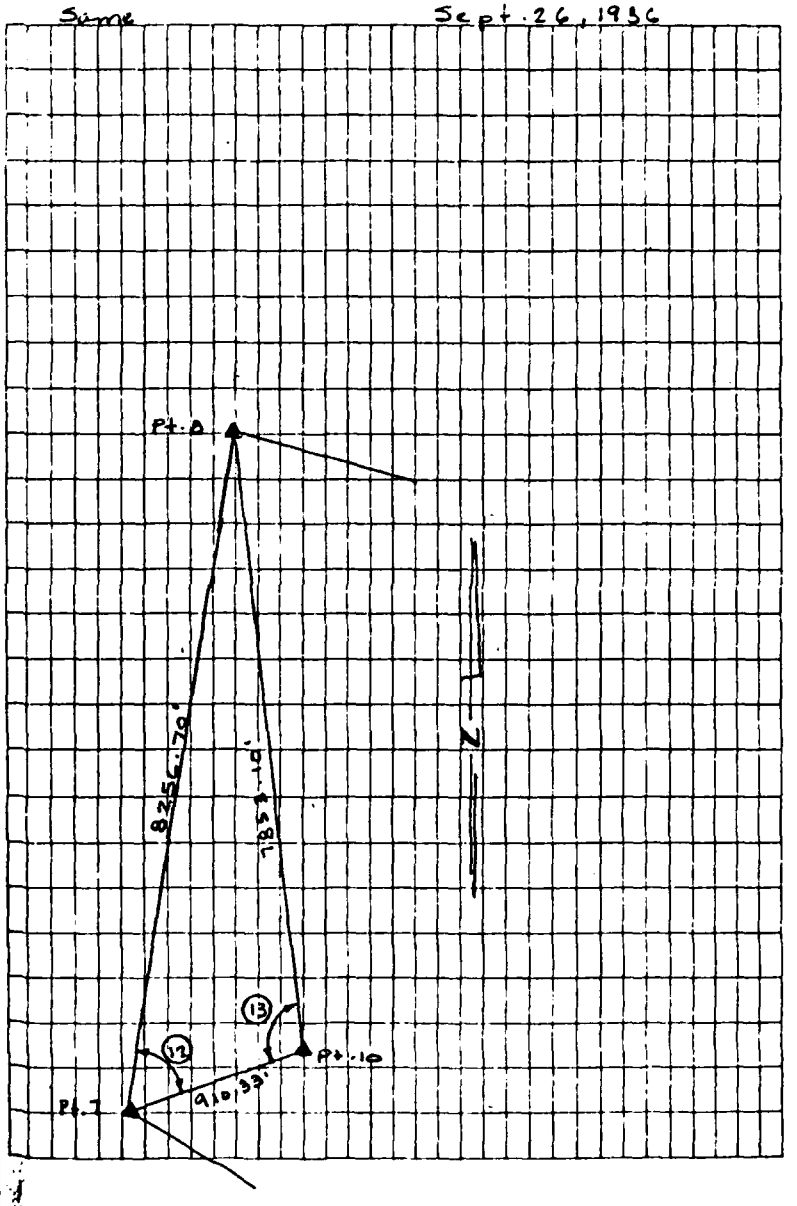
(CONT.)

At Pt. 7 B.S Pt. 6

| Sta | | initial reading | end reading | Dist Ft. | M. | Vert. ∠ |
|---|---|---|---|---|---|---|
| | | Hor. ∠ | | | | |
| Sta: W1 | 1) | 0-00 | 49-07-03 | 380.60' | 116.005 | 269-39-23 |
| | 2) | 22-19-21 | 80-26-21 | | H = 380.59' | |
| | | Avg. = 49-07-01 | | | | |
| Sta: B3 | 1) | 0-00 | 323-12-12 | 933.33 | 284.481 | 269-22-23 |
| | 2) | 38-34-18 | 1-46-30 | | H. = 933.27' | |
| | | Avg. = 323-12-12 | | | | |
| Sta: B1 | 1) | 0-00 | 228-32-13 | 329.87' | 100.546 | 268-06-57 |
| | 2) | 39-20-40 | 267-52-57 | | H = 329.69' | |
| | | Avg. = 228-32-13 | | | | |
| Sta: B2 | 1) | 0-00 | 286-51-46 | 750.99' | 228.907 | 269-19-24 |
| | 2) | 24-54-01 | 311-45-37 | | H = 750.95' | |
| | | Avg. = 286-51-41 | | | | |

| (12) | | initial reading | end read | |
|---|---|---|---|---|
| direct | 1) | 0-00 | 60-49-20 | |
| | 2) | 26-27-37 | 87-16-52 | Avg.: 60-49-20 |
| close | 1) | 0-00 | 299-10-37 | |
| | 2) | 10-50-31 | 310-01-10 | |
| Dist Pt. 7 to Pt. 10 = 910.34' (277.475 m) | | | | V = 269-43-10 / 90-17-06 |

Same Sept. 26, 1956



same — Sept. 26, 1946

(CONT.)

(13)

| | | initial reading | | end reading | | |
|---|---|---|---|---|---|---|
| direct | 1) | 0-00 | | 113-22-15 | | |
| | 2) | 28-09-09 | | 141-31-19 | Avg. = | 113-22-12 |
| close | 1) | 0-00 | | 246-37-53 | | |
| | 2) | 44-36-25 | | 291-14-09 | | |

S. Dist. Pt. 10 to Pt. B = 7853.10 (2393.634) V. 269-59-52 9a-00-10

| Sta. | At | Pt. 10 Hor. ∡ initial reading | B.S. Pt. B end reading | Dist. Ft. | M. | Vert. ∡ |
|---|---|---|---|---|---|---|
| 006-B2 | 1) | 0-00 | 42-06-34 | 1087.50' | 331.468 | 268-39-40 |
| | 2) | 36-32-00 | 78-28-29 | H = 1087.20' | | |
| | | Avg. | 42-06-32 | | | |
| 006-1047 | 1) | 0-00 | 53-28-23 | 1483.77' | 452.263 | 268-55-36 |
| | 2) | 30-43-44 | 84-11-59 | H = 1483.51' | | |
| | | Avg. | 53-28-19 | | | |
| 006-9048 | 1) | 0-00 | 55-30-58 | 1570.98' | 478.838 | 268-58-01 |
| | 2) | 33-07-08 | 88-37-56 | H = 1570.72' | | |
| | | Avg. = | 55-30-50 | | | |
| 006-B1 | 1) | 0-00 | 61-42-10 | 1254.58' | 382.405 | 268-52-58 |
| | 2) | 29-27-43 | 91-09-46 | H = 1254.34' | | |
| | | Avg. = | 61-42-07 | | | |

Same Sept. 26, 1986

(CONT.)

TR Pt. 1 B.S. Pt. 1B

| Sta. | | Hor. ∠ Initial R. | Hor. ∠ End R. | Dist Ft. | Dist M. | Vert. ∠ |
|---|---|---|---|---|---|---|
| 005:W. | 1) | 0-00 | 275-52-07 | | | |
| | 2) | 25-33-35 | 301-25-37 | 290.19 | 88.451 | 270-00-20 |
| | | Avg = 275-52-06 | | H = 290.19 | | |

TR Pt. 2 B.S. Pt. 1

| Sta. | | Hor. ∠ Initial R. | Hor. ∠ End R. | Dist Ft. | Dist M | Vert. ∠ |
|---|---|---|---|---|---|---|
| Edge water) 001-9003 | 1) | 0-00 | 116-41-13 | 439.04' | 133.824 | 269-21-25 |
| | 2) | 50-22-22 | 167-03-37 | H = 439.01' | | |
| | | Avg = 116-41-14 | | | | |
| 001-B1 (conc) | 1) | 0-00 | 109-00-47 | 362.04' | 110.352 | 269-24-08 |
| | 2) | 23-25-31 | 132-36-16 | H = 362.07' | | |
| | | Avg = 109-00-46 | | | | |
| 001-B2 (conc) | 1) | 0-00 | 93-54-25 | 91.99' | 28.050 | 267-44-23 |
| | 2) | 21-10-03 | 123-04-26 | H = 91.94' | | |
| | | Avg = 93-54-24 | | | | |
| 001-9001 (Edge W.) | 1) | 0-00 | 141-22-30 | 36.30' | 11.020 | 261-25-26 |
| | 2) | 13-38-41 | 161-21-19 | H = 35.82' | | |
| | | Avg = 141-22-38 | | | | |
| Inlet Pipe | 1) | 0-00 | 220-58-13 | 135.17' | 41.189 | 268-01-22 |
| | 2) | 27-35-47 | 248-33-54 | H = 135.07' | | |
| | | Avg = 220-58-09 | | | | |
| 001-B3 (conc) | 1) | 0-00 | 215-40-34 | 262.36' | 79.960 | 268-58-22 |
| | 2) | 23-10-08 | 238-50-46 | H = 262.31' | | |
| | | Avg = 215-40-36 | | | | |

(CONT.)

T 2 Pt. 2 B.S. Pt. 1

| Sta. | Horz. ∠ initial reading | Horz. ∠ end reading | S. Dist Ft. | S. Dist M. | Vert ∠ |
|---|---|---|---|---|---|
| 001-9005 (Edge W.) | 1) 0-00 | 15-02-41 | 384.26' | 117.072 | 269-14-42 |
| | 2) 22-35-57 | 217-23-43 | H = 384.14' | | |
| | Avg. = 195-02-44 | | | | |
| 001-9001 (Edge W.) | 1) 0-00 | 171-48-21 | 453.30' | 138.153' | 269-22-20 |
| | 2) 22-51-36 | 208-42-56 | H = 453.30' | | |
| | Avg = 177-48-20 | | | | |
| 001-WH Well | 1) 0-00 | 176-05-15 | 466.56' | 142.212 | 269-32-20 |
| | 2) 17-36-32 | 193-41-52 | H = 466.55' | | |
| | Avg. 176-05-18 | | | | |
| T 2 Pt. 3 = B.S. Pt. 1 | | | | | |
| 001-9004 (Ext Ditch) | 1) 0-00 | 77-43-01 | 564.08' | 171.929 | 268-38-39 |
| | 2) 38-21-12 | 116-03-54 | H = 563.98' | | |
| | Avg = 77-42-53 | | | | |
| 003-B2 | 1) 0-00 | 254-20-51 | 1088.07' | 331.642 | 270-08-41 |
| | 2) 40-35-29 | 294-46-06 | H = 1088.07' | | |
| | Avg. = 254-20-54 | | | | |
| 003-B2 | 1) 0-00 | 256-57-37 | 912.91' | 278.256 | 270-07-56 |
| | 2) 23-12-13 | 280-07-52 | H = 912.91' | | |
| | Avg = 256-57-36 | | | | |
| 003-B1 | 1) 0-00 | 250-43-45 | 1018.32' | 310.378 | 270-14-54 |
| | 2) 34-43-25 | 285-26-46 | H = 1018.30' | | |
| | Avg. = 250-43-41 | | | | |
| 003-B4 | 1) 0-00 | 252-18-45 | 862.85' | 263.002 | 270-10-56 |
| | 2) 33-36-03 | 240-55-02 | H. = 862.84' | | |
| | Avg = 252-18-42 | | | | |

L. Drewes
G. McMahon
J. Curry

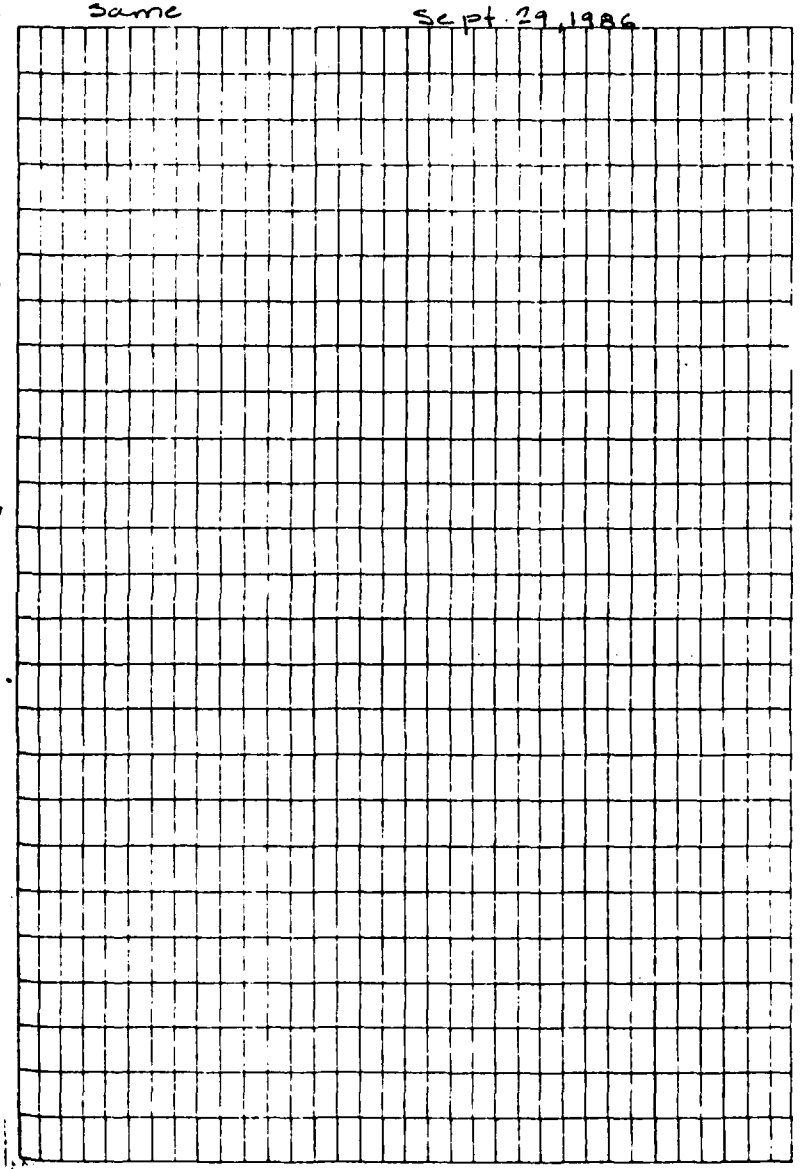
-27

Sept. 2nd, 1986

(Cont.)

| Sta. | Hor. ∠ initial reading | Hor. ∠ end reading | S. Dist Ft | S. Dist M. | Vert ∠ |
|---|---|---|---|---|---|
| | T ∠ Pt. 4 & B.S. Pt. 3 | | | | |
| 002-B3 1) | 0-00 | 121-00-27 | 756.14' | 230.469 | 269-05-12 |
| 2) | 20-01-17 | 41-01-43 | H = | 756.33' | |
| | Avg. = 121-00-26 | | | | |
| 002-B2 1) | 0-00 | 114-10-30 | 492.76' | 150.186 | 268-38-59 |
| 2) | 30-30-37 | 144-41-04 | H = | 492.61' | |
| | Avg = 114-10-29 | | | | |
| 002-B1 1) | 0-00 | 54-16-22 | 515.50' | 157.119 | 269-12-27 |
| 2) | 37-24-08 | 91-40-04 | H = | 515.44' | |
| | Avg. = | 54-15-59 | | | |
| 002-9026 1) (Edge W.) | 0-00 | 53-22-46 | 619.64' | 188.855 | 269-19-28 |
| 2) | 25-29-48 | 78-52-35 | H = | 619.58' | |
| | Avg = 53-22-46 | | | | |
| 002-9030 1) (Edge W.) | 0-00 | 46-52-09 | 699.47' | 213.205 | 269-30-27 |
| 2) | 22-37-44 | 69-30-00 | H = | 699.45' | |
| | Avg = | 46-52-13 | | | |
| 002-9025 1) (Edge W. | 0-00 | 44-33-36 | 1226.77' | 373.921 | 269-43-14 |
| 2) | 27-55-03 | 72-28-35 | H = | 1226.76' | |
| | Avg = 44-33-33 | | | | |
| 002-9021 1) (1 Pump) | 0-00 | 51-36-57 | 1274.10' | 388.341 | 269-50-25 |
| 2) | 20-34-38 | 72-10-56 | H = | 1274.09' | |
| | Avg. = 51-36-53 | | | | |

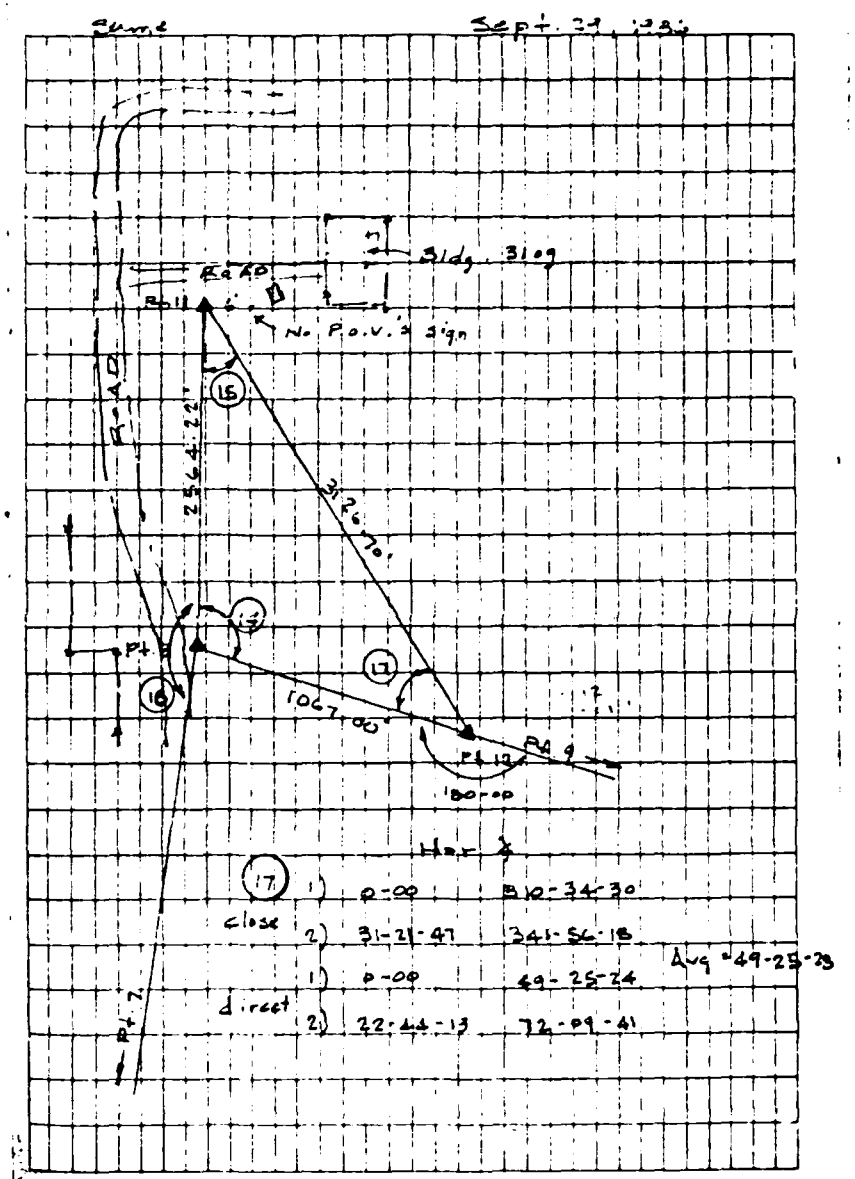
Same Sept. 29, 1986



(CONT.)

| | Hor. ∠ initial reading | Hor. ∠ end reading | Dist Ft. | Dist M. | Vert. ∠ |
|---|---|---|---|---|---|
| | | Pt. 2 to Pt. 3 | Pt. 3 | | |
| 002-9027 in water 1) | 0-00 | 66-20-20 | 1315.53 | 400.986 | 269-35-25 |
| 2) | 23-16-45 | 34-36-42 | H = 1315.52' | | |
| | Avg. = 66-19-58 | | | | |
| 002-W11 well 1) | 0-00 | 78-24-35 | 1577.81 | 480.920 | 269-42-07 |
| 2) | 25-27-17 | 103-51-51 | H = 1577.81' | | |
| | Avg. = 78-24-34 | | | | |
| (14) | initial reading | end reading | | | |
| direct 1) | 0-00 | 112-03-57 | | | |
| 2) | 23-55-53 | 136-04-52 | Avg. 112-03-00 | | |
| close 1) | 0-00 | 247-50-55 | | | |
| 2) | 20-06-13 | 307-57-15 | | | 269-56-15 90-04-04 |
| S. Dist. Pt. 8 to Pt. 11 = 2564.22' (781.577m) V = | | | | | |
| S. Dist Pt. 8 to Pt. 12 = 1067.01' (325.226m) V = | | | | | 269-48-34 90-11-42 |
| (15) | | | | | |
| direct 1) | 0-00 | 18-25-36 | | | |
| 2) | 30-29-45 | 48-55-19 | | | |
| close 1) | 0-00 | 341-34-29 | Avg. = 18-25-33 | | |
| 2) | 29-16-19 | 10-50-42 | | | |
| S. Dist Pt. 11 to Pt. 12 = 3126.78 (953.017m) V = | | | | | 269-58-08 90-02-13 |
| (16) | | | | | |
| direct 1) | 0-00 | 173-00-31 | | | |
| 2) | 26-38-00 | 199-38-32 | Avg. = 173-00-31 | | |
| close 1) | 0-00 | 186-59-31 | | | |
| 2) | 320-30-14 | 147-35-46 | | | |

Sunny Sept. 29, 1981



(CONT.)



| Sta. | | Hor. ∠ initial reading | Hor. ∠ end reading | Dist Ft. | Dist M. | Vert. ∠ |
|---|---|---|---|---|---|---|
| | | T @ Pt. 11 B.S. Pt. 8 | | | | |
| 007 - B4 | 1) | 0-00 | 167-55-34 | 698.54' | 212.913 | 269-38-36 |
| | 2) | 27-55-37 | 195-51-05 | H = 698.53' | | |
| | | Avg. = 167-55-31 | | | | |
| 007 - B2 | 1) | 0-00 | 171-45-44 | 1052.86' | 320.917 | 269-39-07 |
| | 2) | 43-00-54 | 214-46-40 | H = 1052.85' | | |
| | | Avg : 171-45-45 | | | | |
| 007 - B1 | 1) | 0-00 | 179-00-16 | 1042.64' | 317.802 | 269-37-04 |
| | 2) | 23-40-17 | 203-40-33 | H = 1042.62' | | |
| | | Avg = 179-00-15 | | | | |
| 007 - B3 | 1) | 0-00 | 181-09-20 | 551.50' | 168.086 | 269-36-52 |
| | 2) | 26-19-10 | 207-28-27 | H = 551.47' | | |
| | | Avg. = 181-09-19 | | | | |
| | | T @ P.T. 18 | B.S. Pt. 1 | | | |
| B4 | 1) | 0-00 | 285-38-38 | 64.30 | 19.586 | 268-26-22 |
| | 2) | 18-12-06 | 303-50-45 | H = 64.26' | | |
| | | Avg. = 285-38-38 | | | | |
| B3 | 1) | 0-00 | 275-02-00 | 229.75 | 70.025 | 269-31-19 |
| | 2) | 12-22-13 | 287-24-17 | H = 229.73' | | |
| | | Avg = 275-02-02 | | | | |
| B2 | 1) | 0-00 | 275-02-38 | 411.38' | 125.380 | 269-46-58 |
| | 2) | 30-39-20 | 305-41-55 | H = 411.36' | | |
| | | Avg = 275-02-35 | | | | |

Sums

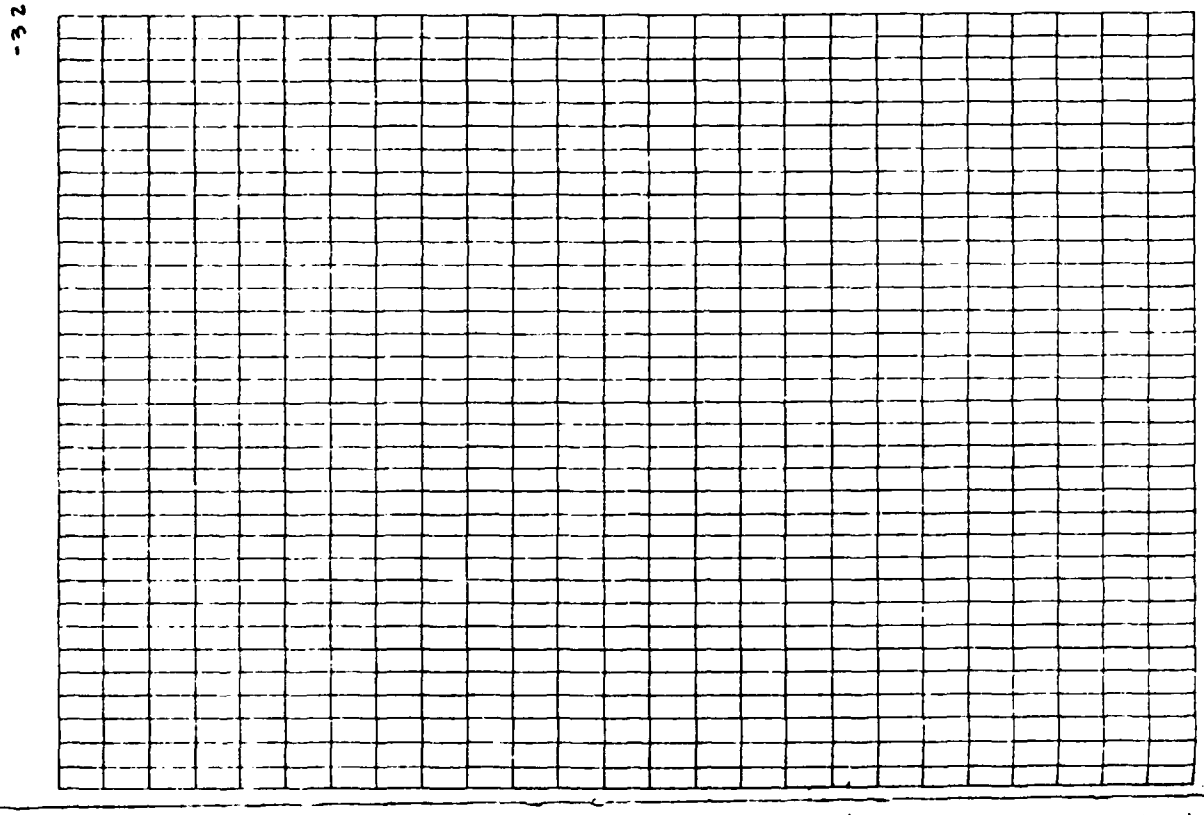
L. Drewes
G. McMahan
J. Curry

Sept. 30, 1986

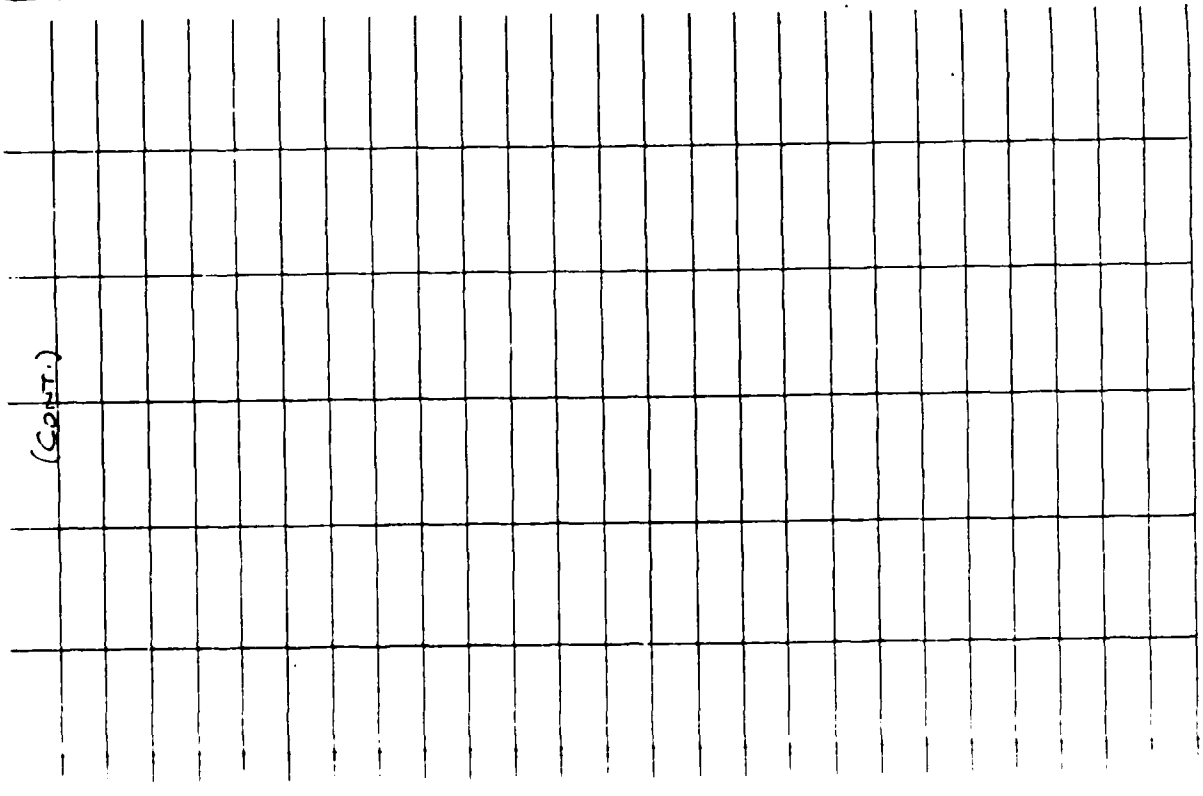
Cont.

| | | Horiz. ∠ | | Dist | | Vert. ∠ |
|---|---|---|---|---|---|---|
| | | initial reading | end reading | Ft | M | |
| B1 | 1) | 0-00 | 278-04-45 | 609.21' | 185.691 | 270-04-06 |
| | 2) | 21-01-30 | 219-06-12 | H = 609.22' | | |
| | | Avg = 278-04-43 | | | | |
| B10 | 1) | 0-00 | 287-03-45 | 555.75' | 169.430 | 270-03-05 |
| | 2) | 16-56-05 | 303-59-40 | H = 555.81' | | |
| | | Avg. = 287-03-40 | | | | |
| B9 | 1) | 0-00 | 307-59-35 | 383.62' | 116.941 | 269-54-02 |
| | 2) | 27-00-39 | 335-00-10 | H = 383.64' | | |
| | | Avg = 307-59-28 | | | | |
| B8 | 1) | 0-00 | 302-46-46 | 308.94' | 94.176 | 269-56-16 |
| | 2) | 19-29-15 | 322-15-58 | H = 308.96' | | |
| | | Avg. = 302-46-45 | | | | |
| B7 | 1) | 0-00 | 316-06-08 | 306.69' | 93.477 | 269-53-04 |
| | 2) | 22-01-16 | 338-07-21 | H = 306.68' | | |
| | | Avg. = 316-06-07 | | | | |
| B6 | 1) | 0-00 | 316-46-49 | 222.32' | 67.757 | 269-53-46 |
| | 2) | 14-06-15 | 330-53-04 | H = 222.30' | | |
| | | Avg. = 316-46-49 | | | | |
| B5 | 1) | 0-00 | 337-32-20 | 261.27' | 79.621 | 269-52-12 |
| | 2) | 27-36-42 | 5-09-05 | H = 261.24' | | |
| | | Avg. = 337-32-22 | | | | |

-32



(CONT.)



L. Drewes
G. McMahan
J. Curry

Sept. 30, 1986

| | | | | |
|---|---|---|---|---|
| | 55.54 | ... | 49.01 | |
| TP 4 | 7.585<br>6.48<br>5.375 | 30.91 | 4.04<br>2.82<br>1.595 | 24.43 |
| TP 3 | 11.885<br>10.63<br>9.415 | 27.25 | 0.885<br>0.465<br>0.04 | 16.62 |
| TP 2 | 12.195<br>10.98<br>9.765 | 17.08 | 3.91<br>2.655<br>1.40 | 6.10 |
| TBM 8 | 5.845<br>4.46<br>3.025 | 8.76 | 3.60<br>2.67<br>1.745 | 4.30 |
| * TBM 7 | 5.47<br>4.46<br>3.45 | 6.97 | 6.045<br>4.675<br>3.30 | 2.51 |
| TP 1 | 4.37<br>3.50<br>2.640 | 7.18 | 13.163<br>12.25<br>11.035 | 3.68 |
| TBM 6 | 1.315<br>0.695<br>0.070 | 15.93 | 7.20<br>6.385<br>5.57 | 15.23 |
| TBM 5 | 2.615<br>1.655<br>0.69 | 21.62 | 3.435<br>3.05<br>2.665 | 19.97 |
| TBM 4 | 2.47<br>2.175<br>1.88 | 23.02 | 6.490<br>4.90<br>3.48 | 20.85 |
| TBM 3 | 2.300<br>1.185<br>0.37 | 25.83 | 6.02<br>4.37<br>3.725 | 24.64 |
| TBM 2 | 3.600<br>2.475<br>1.175 | 29.51 | 3.51<br>2.44<br>1.37 | 27.08 |
| TBM 1 | 3.415<br>2.145<br>0.58 | 29.52 | 3.26<br>1.75<br>0.23 | 27.37 |
| BM | 5.89<br>4.75<br>3.69 | 29.12 | | 3324.37 |

1"x2" guard

1"x2" guard

nail n. side pole 6A2A s. side of pond

nail w. side Pole 6A1 E. side of pond, W. r.o.w. of War Rd.

1"x2" guard

top op. nut E.H. 200' E. bldg. 6ds

El. ex. str. n2. E.H. s. of bldg. 550

Top op. nut E.H. s. of bldg. 543

El. ex. str. n2. E.H. 100' W. of 4th st. on "C" st.

top op. nut E.H. between "C" & "D" st. on 2nd st.

(on letters)
El. ex. str. n2. E.H. between "D" & "E" st. on 1st st.

P.I. - 1B

| | | (CONT.) | | |
|---|---|---|---|---|
| | 57.96 | | 67.68 | |
| TP 11 | 6.565<br>5.385<br>4.21 | 20.70 | 5.335<br>4.09<br>2.855 | 15.31 |
| TBM 13 | 5.785<br>4.28<br>2.785 | 19.60 | 6.77<br>4.77<br>2.775 | 15.12 |
| TBM 12 | 8.70<br>6.935<br>5.17 | 19.89 | 5.285<br>4.36<br>3.435 | 12.95 |
| TBM 11 | 7.27<br>6.105<br>4.44 | 17.31 | 3.84<br>2.875<br>1.915 | 11.20 |
| TP 10 | 8.26<br>7.13<br>6.00 | 14.08 | 4.32<br>3.045<br>1.975 | 6.95 |
| TP 9 | 10.70<br>9.42<br>8.16 | 10.00 | 3.985<br>2.90<br>1.815 | 0.57 |
| TP 8 | 9.91<br>8.65<br>7.385 | 8.47 | 12.76<br>11.320<br>9.875 | 94.82 |
| TBM 10 | 2.645<br>1.58<br>0.52 | 6.14 | 7.70<br>6.475<br>5.245 | 4.56 |
| TP 7 | 3.835<br>2.93<br>1.965 | 11.03 | 13.375<br>12.18<br>10.99 | 8.13 |
| TP 6 | 1.865<br>1.015<br>0.165 | 20.31 | 11.00<br>9.860<br>8.725 | 19.29 |
| TP 5 | 2.90<br>1.80<br>0.69 | 29.15 | 4.565<br>2.75<br>0.93 | 27.35 |
| TBM 9 | 3.57<br>2.25<br>0.94 | 30.10<br>30.91 | 4.280<br>3.055<br>1.83 | 27.85 |

Same Oct. 1, 1986

1"x2" guard E. side Pvmt.

N.W. cor. well site 208-W02

top P.2 tie at P.I. point 5

"X" on conc. base of 208-W03 (well)

1"x2" guard

1"x2" guard

1"x2" guard 15' W. of 208-B2

top rod P.I. point 4 (see p. 20)

" "

1"x2" guard

Nail in 5. side pole out side fence on E. side by bore 005's

| | | | | |
|---|---|---|---|---|
| | 74.25 | (cont.) | 56.85 | |
| TP 20 | 8.06<br>6.525<br>5.55 | 38.04 | 5.11<br>3.890<br>2.665 | 31.24 |
| TP 19 | 8.56<br>7.35<br>6.14 | 35.12 | 5.635<br>4.395<br>3.165 | 27.78 |
| TP 18 | 8.33<br>7.025<br>5.74 | 32.18 | 6.095<br>4.855<br>3.615 | 25.14 |
| TP 17 | 7.77<br>6.50<br>5.25 | 29.99 | 5.29<br>4.07<br>2.86 | 23.49 |
| TP 16 | 8.465<br>7.22<br>5.97 | 27.56 | 5.11<br>3.93<br>2.755 | 20.34 |
| TP 15 | 7.57<br>6.355<br>5.14 | 24.27 | 9.71<br>8.465<br>7.225 | 17.91 |
| TBM 16 | 8.685<br>7.52<br>6.355 | 26.38 | 5.41<br>4.515<br>3.615 | 18.86 |
| TBM 15 | 6.175<br>5.235<br>4.295 | 23.37 | 6.05<br>4.30<br>2.55 | 18.13 |
| TP 14 | 6.840<br>5.555<br>4.27 | 22.43 | 5.845<br>4.66<br>3.47 | 16.87 |
| TP 13 | 7.12<br>5.86<br>4.60 | 21.53 | 6.245<br>5.055<br>3.87 | 15.67 |
| TP 12 | 5.85<br>4.535<br>3.215 | 20.73 | 6.215<br>4.96<br>3.71 | 16.20 |
| TBM 14 | 5.345<br>4.20<br>3.215 | 21.16 | 4.855<br>3.825<br>2.79 | 16.88 |
| | | 20.70 | | |

same Oct. 1, 1986

(mkd.)

1" x 2" guard (mkd)

N.W. cor. conc. slab at 008-W05 (well)

"x" in conc. base of well 008-W04

1" x 2" guard

"x" in conc. base of well 008-W01

(CONT.)

| | | | | | |
|---|---|---|---|---|---|
| | | 52.375 | | 69.945 | |
| IP 29 | 6.925<br>5.92<br>4.91 | 20.45 | 6.08<br>4.89<br>3.705 | 14.53 | |
| IP 28 | 5.765<br>4.535<br>3.32 | 19.43 | 7.425<br>6.185<br>4.945 | 14.85 | |
| TBM 18 | 4.375<br>3.145<br>1.915 | 21.07 | 6.01<br>5.095<br>4.19 | 17.92 | |
| IP 27 | 2.770<br>1.805<br>0.855 | 23.02 | 9.635<br>8.525<br>7.515 | 21.22 | |
| IP 26 | 3.130<br>1.995<br>0.865 | 29.75 | 10.31<br>9.025<br>7.74 | 27.75 | |
| IP 25 | 8.065<br>6.78<br>5.415 | 36.78 | 8.395<br>7.145<br>5.895 | 30.04 | |
| IP 24 | 6.845<br>5.54<br>4.235 | 37.19 | 6.995<br>5.65<br>4.31 | 31.65 | ✓ |
| IP 23 | 5.510<br>4.16 *<br>2.825 | 37.30 | 11.21<br>10.145<br>9.005 | 33.14 | |
| TBM 17 | 8.015<br>6.62<br>5.23 | 43.29 | 5.62<br>3.905<br>2.19 | 36.67 | |
| IP 22 | 7.495<br>5.375<br>3.26 | 40.58 | 5.94<br>4.72<br>3.505 | 35.20 | |
| IP 21 | 7.835<br>6.54<br>5.24 | 39.72 | 5.88<br>4.66<br>3.445 | 33.38 | |
| | | 38.04 | | | |

* - mocked

Same Oct. 1, 1986

" " " " "

1"x2" guard in N-S fence

top ap. nut E.W. 40' S.W. of bldg. 3172

" " at fence cor.

" " " " "

1"x2" guard in E-W fence

1"x2" guard at fence cor.

1"x2" guard in fence 190' W. of P.I. Point 7

Top nail @ well 004-W1

" " "

1"x2" guard (mkd.)

| | | | | |
|---|---|---|---|---|
| | 70.909 | (CONT.) | 52.00 | |
| TP 37 | 8.675<br>7.43<br>6.18 | 39.43 | 3.985<br>2.84<br>1.685 | 32.00 |
| TP 36 | 10.870<br>9.575<br>8.325 | 34.84 | 4.54<br>3.37<br>2.195 | 25.25 |
| TP 25 | 7.70<br>6.47<br>5.28 | 28.62 | 6.68<br>5.52<br>4.355 | 22.13 |
| TP 34 | 5.495<br>4.305<br>3.115 | 27.65 | 8.475<br>7.335<br>6.195 | 23.34 |
| TP 33 | 4.61<br>3.33<br>2.05 | mistake<br>30.68 | 7.85<br>6.685<br>5.525 | 27.34 |
| TBM 22 | 4.41<br>3.14<br>1.865 | 34.03 | 5.98<br>4.75<br>3.52 | 30.89 |
| TP 32 | 5.925<br>4.73<br>3.54 | 35.64 | 6.16<br>4.975<br>3.79 | 30.91 |
| TP 31 | 5.70<br>4.48<br>3.265 | 35.89 | 6.305<br>5.14<br>3.975 | 31.41 |
| TBM 21 | 6.44<br>5.22<br>4.01 | 36.55 | 5.305<br>4.325<br>3.35 | 31.33 |
| TBM 20 | 6.670<br>5.670<br>4.675 | 35.66 | 4.10<br>2.69<br>1.285 | 29.99 |
| TP 30 | 9.225<br>8.165<br>7.10 | 32.68 | 3.225<br>1.78<br>0.33 | 24.51 |
| TBM 19 | 9.62<br>8.43<br>7.24 | 16 24 | 3.555<br>2.590<br>1.625 | 17.86 |
| | | 20.45 | | |

Same Oct. 1, 1936

" " " " "

" " " " " opposite rd. to small arms range

" " " " "

" " " " "

1" x 2" guard in N.S fence

nail in W. side pole, 150' S.W. of bldg. 3147

" " " " "

1" x 2" guard in N.S fence

" " " " pole # 417

nail in E. side pole #419

1" x 2" guard in N.S fence 3146

nail in E. side pole, (1st pole S. # 492, 300' S.W. of bldg 3146

(CONT.)

| | | | | |
|---|---|---|---|---|
| | 55.44 | | 60.21 | |
| T.P. 48 | 7.43<br>6.175 6.18<br>4.305 | 34.66 | 7.03<br>5.83 5.83<br>4.645 | 28.48 |
| T.P. 47 | 6.055<br>4.745 4.75<br>2.435 | 34.31 | 8.950<br>5.21 5.21<br>4.465 | 29.56 |
| T.P. 46 | 5.80<br>3.85 3.85<br>2.900 | 34.77 | 8.305<br>7.110 7.11<br>5.920 | 29.92 |
| T.P. 45 | 6.280<br>3.930 3.93<br>2.285 | 37.03 | 8.265<br>7.040 7.04<br>5.829 | 32.06 |
| T.P. 44 | 6.810<br>5.145 5.14<br>3.720 | 40.11 | 8.210<br>6.535 6.54<br>5.355 | 34.97 |
| T.P. 43 | 5.375<br>3.670 3.67<br>2.165 | 40.50 | 7.038<br>6.810 6.81<br>5.892 | 36.83 |
| T.P. 42 | 5.370<br>4.299 4.30<br>3.005 | 42.64 | 6.485<br>5.245<br>4.005 4.01 | 38.34 |
| T.P. 41 | 6.810 5.81<br>5.840<br>4.265 | 43.59 | 6.645<br>5.383<br>4.114 4.11 | 38.05 |
| T.P. 40 | 6.668<br>5.380<br>4.130 4.11 | 43.43 | 6.380<br>5.110 5.11<br>3.920 | 38.05 |
| T.P. 39 | 6.250<br>5.015 5.01<br>3.775 | 43.14 | 5.970<br>4.780<br>3.585 .78 | 38.15 |
| T.P. 38 | 7.955<br>6.680<br>5.293 .65 | 42.93 | 4.73<br>3.145 .15<br>1.565 | 36.28 |
| | | 39.43 | | |

39.43

MEMORANDO
GAUCHEZ

10-3-86

1X2 GUARD IN E-W FENCE

1X2 GUARD @ FENCE CORNER

1X2 GUARD IN N-S FENCE

1X2 GUARD IN N-S FENCE

T&P ½" ERD P.I. PT. NO 11

1X2 GUARD IN N-S FENCE

1X2 GUARD IN N-S FENCE

1X2 GUARD IN N-S FENCE

1X2 GUARD IN N-S FENCE

1X2 GUARD IN N-S FENCE 400'± N. OF FENCE CORNER

1"x2" guard in N-S fence 50' S. of P.I. point 8

(CONT)

| | | | | | |
|---|---|---|---|---|---|
| | 68.36 | | 73.45 | | |
| T.P.60 | 7.76<br>6.449<br>6.139 6.45 | 29.57 | 5.470<br>4.465<br>2.045 4.22 | 23.12 | |
| T.P. 59 | 7.825<br>6.61<br>5.135 6.51 | 27.39 | 5.92<br>4.715<br>3.51 4.71 | 20.88 | |
| T.P 58 | 6.928<br>7.65<br>6.37 7.63 | 25.59 | 7.825<br>6.98<br>6.875 6.95 | 17.94 | |
| T.P 57 | 6.13<br>5.76<br>4.185 5.14 | 24.89 | 8.07<br>6.89<br>5.815 6.85 | 19.73 | |
| T.P. 56 | 7.57<br>6.28<br>5.029 6.28 | 26.57 | 9.485<br>8.27<br>7.085 8.27 | 20.29 | |
| T.P. 55 | 5.03<br>3.81<br>2.58 3.81 | 28.56 | 8.40<br>7.16<br>6.925 7.16 | 24.75 | |
| T.P. 54 | 8.76<br>6.895<br>6.63 6.89 | 31.91 | 6.99<br>5.69<br>4.43 | 25.02 | |
| T.P. 53 | 6.820<br>4.565<br>2.315 4.61 | 30.71 | 7.185<br>5.865<br>5.85 5.86 | 26.14 | |
| T.P. 52 | 6.86<br>5.89<br>4.21 5.93 | 32.00 | 7.58<br>6.30<br>5.07 6.30 | 26.41 | |
| T.P. 51 | 6.46<br>5.180<br>3.91 5.13 | 32.71 | 5.99<br>4.75 4.75<br>3.81 | 27.52 | |
| T.P. 50 | 6.748<br>5.415 5.47<br>4.132 | 32.27 | 6.950<br>5.670<br>4.985 | 26.80 | |
| T.P. 49 | 6.045<br>4.795 4.79<br>3.58 | 32.47 | 8.205 6.98<br>6.175<br>5.75 | 27.68 | |
| | | 34.66 | | | |

10-3-86

1X2 GUARD (W) N-S FENCE

1X2 GUARD (W) N-S FENCE

1X2 GUARD @ FENCE CORNER

1X2 GUARD (W) E-W FENCE

1X2 GUARD (W) E-W FENCE

1X2 GUARD (W) E-W FENCE

1X2 GUARD @ FENCE CORNER W. SIDE MAIN P.W.

1X2 GUARD @ FENCE CORNER W. SIDE MAIN P.W.

1X2 GUARD (W) E-W FENCE

1X2 GUARD (W) E-W FENCE 120' ± S OF E. END WOOD FENCE

1X2 GUARD (W) E-W FENCE 135' ± W. OF W. END WOOD FENCE

1X2 GUARD (W) E-W FENCE 655 ± W. OF W. END WOOD FENCE

| | | (CONT) | | | |
|---|---|---|---|---|---|
| | 56.78 | | 52.75 | | |
| T.P 72 | 5.67<br>4.88<br>4.085 4.88 | 33.40 | 4.09<br>3.23<br>2.37 3.23 | 28.72 | |
| T P 71 | 5.58<br>4.89<br>4.20 4.89 | 31.95 | 4.68<br>3.88 3.88<br>3.975 | 27.06 | |
| T.P. 70 | 5.54<br>4.895<br>4.16 4.89 | 30.94 | 4.98<br>4.16<br>3.345 4.12 | 26.09 | |
| T.P 69 | 5.29<br>4.525<br>3.815 4.33 | 30.21 | 4.980<br>4.155<br>3.185 4.15 | 25.68 | |
| T.P 68 | 4.865<br>4.15<br>3.445 4.15 | 29.83 | 5.33<br>4.645<br>3.895 4.57 | 25.68 | |
| T.P 67 | 5.105<br>4.39<br>3.67 4.39 | 30.25 | 5.33<br>4.67<br>3.81 4.57 | 25.86 | |
| T.P 66 | 4.675<br>3.96<br>3.235 3.96 | 30.43 | 4.68<br>3.85<br>3.12 3.85 | 26.47 | |
| T.P 65 | 4.23<br>3.485<br>2.795 3.49 | 30.32 | 5.31<br>4.57<br>3.83 4.57 | 26.83 | |
| T.P 64 | 4.87<br>4.175<br>3.44 4.17 | 31.40 | 6.020<br>5.285<br>4.550 5.28 | 27.23 | |
| T.P 63 | 6.375<br>5.54<br>4.725 5.54 | 32.51 | 7.01<br>5.84<br>4.58 5.80 | 26.97 | |
| T.P 62 | 6.31<br>4.98<br>4.460 4.98 | 32.77 | 6.11<br>4.96<br>4.32 4.96 | 27.79 | |
| T.P 61 | 6.22<br>5.355<br>4.685 4.75 | 32.11 | 5.025<br>3.815<br>2.595 3.81 | 25.76 | |
| | | 29.57 | | | |

SAND

10-3-86

| |
|---|
| 60d NAIL W. SIDE P.P. NO. 330 N |
| 60d NAIL W. SIDE P.P NO. 330 "O" |
| 60d NAIL W. SIDE P.P NO. 330 P |
| 60d NAIL W. SIDE P.P NO. 330 Q |
| 60d NAIL W. SIDE P.P. No. 330R |
| 60d NAIL W. SIDE P.P. NO. 330 S |
| 60d NAIL W. SIDE P.P. NO. 330 T |
| 60d NAIL W. SIDE P.P. NO. 330 M |
| 60d NAIL W. SIDE P.P NO. 330 V |
| 1x2 GUARD ON N-S FENCE |
| 1x2 GUARD ON N-S FENCE |
| 1x2 GUARD ON N-S FENCE |

(CONT)

| | | | | |
|---|---|---|---|---|
| | 51.18 | | 53.74 | |
| TP 84 | 5.885<br>4.49<br>3.54 | 31.06 | 6.81<br>5.435<br>4.50 | 26.55 |
| TP 83 | 3.095<br>1.71<br>5.325 | 31.99 | 5.81<br>4.62<br>3.43 | 30.28 |
| TP 82 | 5.79<br>4.44<br>3.08 | 34.90 | 7.33<br>6.13<br>4.95 | 30.46 |
| TP 81 | 6.79<br>5.84<br>4.15 | 36.59 | 3.88<br>2.33<br>0.715 | 31.13 |
| T.P 80 | 9.83<br>0.54<br>1.24 | 33.46 | 3.56<br>2.37<br>1.18 | 24.92 |
| T.P 79 | 6.13<br>4.77 | 27.29 | 6.51<br>4.56<br>3.415 4.56 | 21.16 |
| T.P 78 | 3.14<br>2.12<br>1.90 2.66 | 25.72 | 6.66<br>5.83<br>6.10 5.81 | 23.10 |
| T.P 77 | 8.84<br>2.13<br>1.82 2.13 | 28.93 | 7.055<br>6.315<br>5.875 6.31 | 26.80 |
| T.P 76 | 3.56<br>2.885<br>2.15 2.85 | 33.11 | 5.86<br>5.125<br>4.39 5.12 | 30.26 |
| T.P. 75 | 4.41<br>3.65<br>2.895 3.65 | 35.38 | 5.31<br>4.37<br>3.43 4.37 | 31.73 |
| T.P. 74 | 5.12<br>4.265<br>3 4.2 4.27 | 36.10 | 7.625<br>3.79<br>2.93 3.78 | 31.85 |
| T.P 73 | 5.685<br>3.893<br>4.105 4.31 | 25.61<br>33.60 | 3.72<br>3.88<br>2.89 2.88 | 30.72 |

10-3-86

nail w. side pole 223' I'

Top of nut F.H. 10' N.W of bldg 48 on E. side Hampshire Rd.

top P.I 20 mon.

nail in w. side pole *

1"x3" guard

Rod Nail S. side P.P No. 330E

Rod Nail S. side P.P No.

Rod Nail S. side PP No. 330 I

Rod Nail S. side PP No. 330 J

Rod Nail S. side P.P No. 330 K

Rod Nail N. side P.P No. 330 L

Rod NAIL N side P.P No. 330 M

L. Drewes
G. McMahan
J. Curry

-12-

oct. 6, 1986

(CONT.)

| | | | | | |
|---|---|---|---|---|---|
| B.M | | | 6.19<br>5.63<br>5.07 | 24.35 | 3324.37 |
| TP.87 | 5.39<br>4.735<br>4.08 | 29.18 | 6.01<br>4.87<br>3.935 | 25.24 | |
| TP.86 | 5.585<br>4.35<br>3.12 | 30.11 | 6.185<br>5.085<br>4.02 | 25.76 | |
| TP.85 | 5.74<br>4.45<br>3.16 | 30.85 | 5.55<br>4.64<br>3.73 | 26.40 | |
| | | 31.04 | | | |

top P.I. 18 mon.

nail in w. side of pole = 172

nail in w. side of pole = 227

| | | (CONT.) | | | |
|---|---|---|---|---|---|
| TBM 2 | | | 3.57<br>2.62<br>1.67 | 27.09 | grd. |
| B5 | | | 6.78<br>5.83<br>4.87 | 23.38 | " |
| B6 | | | 6.00<br>5.53<br>5.05 | | " |
| B7 | | | 6.44<br>5.76<br>5.07 | 23.95 | " |
| B8 | | | 6.01<br>5.53<br>5.04 | 24.10 | " |
| B9 | | | 6.75<br>5.86<br>4.96 | 23.85 | " |
| B10 | | | 7.27<br>5.60<br>3.94 | 24.11 | grd. |
| B1 | | | 6.82<br>4.84<br>2.86 | 24.87 | Asp |
| TBM1 | | | 3.91<br>2.36<br>0.80 | 27.35 | |
| B2 | | | 6.18<br>5.15<br>4.11 | 24.36 | Asp. |
| B3 | | | 5.79<br>5.45<br>5.11 | 24.26 | grd |
| B4 | | | 6.11<br>5.31<br>4.51 | 24.48 | grd. |
| BM | 6.47<br>5.34<br>4.21 | 29.71 | | 24.37 | |

Same Oct. 6, 1986

top ep. nut F.H.

Fl. av. ft. naz. F.H.

top Fl. 18 mem.

(CONT.)

| | | | | | |
|---|---|---|---|---|---|
| QQ1-B1 | | | 3.48<br>6.45<br>4.42 | 0.14 | |
| QQ1-B2 | | | 7.10<br>6.30<br>5.50 | 0.29 | |
| QQ1-B3 | | | 8.10<br>7.21<br>6.31 | 99.38 | |
| TBMD | 4.24<br>2.39<br>0.84 | 6.59 | | 4.30 | |
| TBMA | | | 2.10<br>1.71<br>0.71 | 6.29 | 4.30 |
| QQ1-W1 | 4.86<br>4.36<br>3.85 | 6.00 | 4.89<br>4.39<br>3.880 | 1.64 | |
| TBM7 | 4.38<br>3.52<br>2.66 | 6.03 | | 2.51 | |
| TBM5 | | | 3.35<br>2.90<br>2.45 | 19.99 | 19.97 |
| QQ5-W1 | 5.48<br>4.22<br>2.97 | 22.89 | 5.55<br>4.30<br>3.04 | 18.67 | |
| TBM4 | 2.63<br>2.12<br>1.61 | 22.97 | | 20.85 | |

Date Oct. 6, 1986

top grd.

top grd.

top grd.

nail in pole 6A2A

nail in pole 6A2A

well top of pvc pipe at black marks

nail in pole 6A1

well top of pvc pipe at notch

(CONT.)

| | | | | | |
|---|---|---|---|---|---|
| 002-B2 | | | 15.18<br>12.39<br>9.64 | 93.76 | |
| TBM 10 | 2.66<br>1.59<br>0.53 | 6.15 | | 4.56 | |
| TP2 | | | 4.81<br>3.04<br>1.27 | 27.35 | 27.35 |
| 003-B4 | | | 3.63<br>3.05<br>2.48 | 27.35 | |
| 003-B1 | | | 2.98<br>1.73<br>0.48 | 28.67 | |
| 003-B3 | | | 4.42<br>3.43<br>2.44 | 26.97 | |
| 003-B2 | | | 5.03<br>3.34<br>1.64 | 27.06 | |
| TBM9 | 3.97<br>2.53<br>1.12 | 30.40 | | 27.85 | |
| TBM7 | | | 6.14<br>4.000<br>2.02 | 2.51 | 2.51 |
| | | 6.59 | | | |

Same

Oct. 6, 1986

top grd.

top rod P.L. point 4

1" x 2" guard.

top grd.

top grd.

" "

top asp.

nail in pole E side fence

nail in nail E/A 1

(CONT.)

| | | | | | |
|---|---|---|---|---|---|
| TP | 6.70<br>4.22<br>2.93 | 7.45 | 4.66<br>3.45<br>2.83 | 2.63 | |
| TP | 5.86<br>4.63<br>3.18 | 6.08 | 5.16<br>3.69<br>2.22 | 1.56 | |
| TP | 9.74<br>8.65<br>7.55 | 5.25 | *5.13<br>4.09<br>3.05 | 96.60 | |
| 002 WI | 4.98<br>3.95<br>2.92 | 0.69 | 5.13<br>4.19<br>3.06 | 96.74 | |
| TP | 5.28<br>4.24<br>3.20 | 0.84 | 8.45<br>7.26<br>6.06 | 96.60 | |
| TP | 5.60<br>2.30<br>1.01 | 3.86 | 6.87<br>5.63<br>4.38 | 1.56 | |
| TP | 5.86<br>4.55<br>3.24 | 7.19 | 6.79<br>4.90<br>3.01 | 2.64 | |
| TBM 10 | 4.89<br>2.98<br>1.06 | 7.56 | | 4.56 | |
| | | | | | |
| TP8 | | | 12.77<br>11.32<br>9.87 | 94.83 | 94.82 |
| 002-B1 | | | 10.12<br>7.63<br>5.05 | | |
| 002-B2 | | | 13.55<br>12.07<br>10.53 | | |
| | | 6.15 | | | |

Same Oct. 6, 1986

nail in s.side pole # 1583

nail in s.wi. side pole # 1581

hub

well top pvc pipe at black marks

hub

nail in s.wiside pole # 1582

nail in s.side pole # 1583

top rod P.I. point 4

1" x 2" guard

top grd.

top grd.

(CONT.)

| | | | | | |
|---|---|---|---|---|---|
| TP 25 | | | 11.32<br>9.61<br>7.90 | 30.05 | 30.04 |
| OOG : B2 | | | 11.65<br>9.54<br>7.44 | 30.12 | |
| OOG : B1 | | | 9.63<br>8.17<br>6.70 | 31.44 | |
| TP 24 | 10.15<br>8.01<br>5.87 | 39.66 | | 31.65 | |
| TBM 17 | | | 4.99<br>3.87<br>2.75 | 36.67 | 36.67 |
| OOG WI | 3.02<br>1.90<br>0.77 | 40.54 | 2.81<br>1.69<br>0.56 | 38.64 | |
| TP 23 | 8.16<br>7.19<br>6.19 | 40.33 | | 33.14 | |
| TBM 12 | | | 4.51<br>2.89<br>0.96 | 4.56 | 4.56 |

June Oct. 6, 1986

1" x 2" guard

top grd.

top grd.

1" x 2" guard at fence cor.

top rod @ well OOG-WI

well top PVC pipe at black marks

1" x 2" guard

top rod B.I. point 4

(CONT.)

| | | | | |
|---|---|---|---|---|
| 097 B4 | | | 5.44<br>4.46<br>3.88 | 31.64 |
| 097 B3 | | | 5.53<br>4.03<br>2.53 | 32.27 |
| TB 46 | 7.31<br>6.28<br>5.45 | 36.30 | | 29.92 |
| TBM1A | | | 2.08 | 17.92 |
| 006 B1 | | | 9.97<br>8.26<br>6.58 | 11.74 |
| 006 B2 | | | 10.35<br>9.09<br>7.84 | 10.91 |
| TBM1A | 3.58<br>2.08<br>0.78 | 20.00 | | 17.92 |
| TP26 | | | 9.08 | 27.75 |
| 009 B3 | | | 7.06<br>5.11<br>3.17 | 31.72 |
| TP26 | 10.19<br>9.08<br>7.97 | 36.83 | | 27.75 |

Jerre Oct. 6, 1986

top grd.

top grd.

1"x2" guard

top ep nut F.H.

top grd.

top grd.

top ep. nut F.H.

top grd.

1"x2" guard

(Cont.)

| | | | | | |
|---|---|---|---|---|---|
| IBM | | | 1.49 | 15.12 | |
| 008 B1 | | | 12.41<br>10.11<br>7.81 | | |
| 008 B2 | | | 4.89<br>3.27<br>1.64 | 13.34 | |
| IBM 13 | 2.89<br>1.49<br>0.10 | 16.61 | | 15.12 | |
| TP 47 | | | 9.090<br>6.77<br>4.45 | 29.53 | 29.56 |
| 007 B1 | | | 8.07<br>7.14<br>6.01 | 29.16 | |
| 007 B2 | | | 7.75<br>6.66<br>5.57 | 29.64 | |
| | | 36.30 | | | |

Same Oct. 6, 1986

N.W. Cor. well slab 008-W02

grd.

top grd.

N.W. Cor well slab 008-W02

1" x 2" at fence cor.

top grd.

top grd.

# APPENDIX F

## RECONDITIONED DRUM DOCUMENTATION

**SCRUB-A-DUBB**
**BARRELL CO.**
810 N. Ash St.
Lubbock, Texas 79417
P.O. Box 5034
**RECONDITIONED DRUMS**
B. C. (Bill) Phillips 806/763-7209

August 1, 1986

Subject: SOIL SAMPLE STORAGE DRUMS - 55 Gal. Open Top DOT 17-H DRUMS

To: Whom it may concern

The 55 Gal. Open Top DOT 17-H Drums used for soil sample and storage which are currently being delivered to Reese Air Force Base Installation have been triple rinsed with hot water. These drums have never contained a chemical which come in contact with the steel surface inside. We removed a plastice liner which left the drum free of any chemical. These drums may contain a small of rust due to temperature inversions and condensation.

Sincerely,

Billy C. Phillips
Manager - Owner

# APPENDIX G

## CHAIN-OF-CUSTODY FORMS

ecology and environment, inc.
195 SUGG ROAD, P.O. BOX D, BUFFALO, N.Y., 14225, TEL. 716-632-4491
International Specialists in the Environment

## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | Reese AFB IRP | M Tanner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| M Tanner | | M. Tanner |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | TDS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 005 | 9/30 | 1630-1635 | | ✓ | | lows | | 1 | ✓ | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| M Tanner | 9/30/86 1 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891035504 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 9/30/86 |

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

*See CONCENTRATION RANGE on back of form.

234158

SITE 005 - 9140

G-2

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF3X00 | REESE AFB IRP | MIKE BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| Bill [illegible] | | MIKE BENNER |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE: COMP | GRAB | AIR | SAMPLE INFORMATION: EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION: Sample Number | NUMBER OF CONTAINERS | VOA | Oil & Grease | Phenols | BNA | Primary Metals | TDS | Pesticides/PCB | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 005 | 9/26 | 0638<br>0730<br>1408 | | X | | Low TOC, Cond. 1303 PH 6.6 | 0165-P6-005-GP-86-9140 | 6 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 000 | 9/26 | 1415 | | X | | Low | 0165-P6-000-GP-86-9200 | 10 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| Bill [illegible] | 9/26 1100 | FEDERAL EXPRESS | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: FEDERAL EXPRESS

BL/Airbill Number: 15F 595 4812

Date: 9/26/86

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234958

G-3

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DE2000 | REESE AFB IRP | Mike Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| Bill Park | | Mike Benner |

| S/C STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION / Sample Number | NUMBER OF CONTAINERS | VOA | Oil & Grease | Phenols | BNA | Primary Metals | TDS | Pesticides/PCB | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 9/16 | ~~0858~~ 0830 | | X | | Low T 70.1°F Cond. 405 Ph 8.37 | 0165-MP-002-GW-96-9044 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | *Time 0830 - 0847 |
| 002 | 9/16 | ~~0850~~ 0845 | | X | | Low T 71.5°F Cond. 312 Ph 7.06 | 0165-MP-002-GW-96-9045 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| Bill Park | 9/16 | Federal Express | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: Federal Express

BL/Airbill Number: 158 545 481

Date: 9/16/96

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23-0056

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International Specialists in the Environment

## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF 2000 | REESE AFB IRP | Mike Bennett |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| Bill Tull / Mike Bennett | | Mike Bennett |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION — Sample Number | NUMBER OF CONTAINERS | VOA | O&G / PHENOLS | BNA | PRIMARY METALS | TDS | PESTICIDES / PCB | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 9/26 | 0915 | | X | | Low T 70.6°F Cond 203 Ph 8.33 | 0165-NP-001-GN-86-9008 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| 001 | 9/26 | 0936 | | X | | Low T 70.6°F Cond. 203 Ph 8.33 | 0165-NP-001-GN-86-9009 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Bill Tull | 9/26 1000 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 15855 9823 — Date: 9/26/86 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REISE AFB IRP | Mike BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| Bill Parr Alan Smith | | Mike BENNER |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | VOA | Oil & Grease | Phenols | TPS | BNA | Org-Chlor. Pest. PCB | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 9/25 | 1337 1621 | | X | | Low T 73.5°F Cond. 1734 PH 7.8 | 0165-P6-002-GP-86-2032 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 004 | 9/25 | 1330 1430 | | X | | Low T 73.7°F Cond 2020 PH 6.8 | 0165-P6-004-GP-86-2034 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Bill Parr | 9/25/86 1930 | Federal Express | | | | Federal EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 8411-035-412 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 9/25/86 |

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23-955

G-6

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International Specialists in the Environment

## CHAIN-OF-CUSTODY RECORD

Page 1 of ~~2~~ 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | Keesc AFB IRP | M. Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| Don Smith Bill Falk | | M. Benner |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | BNA | Oil & Grease | Phenols | TDS | Primary Metals | Pesticide, PCB's | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 1/25/86 | 1450-1521 | | ✓ | | Low | 0165-PG-001-GP-86-9011 | 2 | X | | | | | | | Cond: 474 µmhos/cm T: 72.2°F pH: [illegible] |
| 001 | 1/25/86 | 1450-1521 | | ✓ | | Low | 0165-PG-001-GP-86-9011 | 1 | | X | | | | | | " " " |
| 001 | 1/25/86 | 1450-1521 | | ✓ | | Low | 0165-PG-001-GP-86-9011 | 1 | | | X | | | | | " " " |
| 001 | 1/25/86 | 1450-1521 | | ✓ | | Low | 0165-PG-001-GP-86-9011 | 1 | | | | X | | | | " " " |
| 001 | 1/25/86 | 1450-1521 | | ✓ | | Low | 0165-PG-001-GP-86-9011 | 1 | | | | | X | | | " " " |
| 001 | 1/25/86 | 1450-1521 | | ✓ | | Low | 0165-PG-001-GP-86-9011 | 1 | | | | | | X | | " " " |
| 001 | 1/25/86 | 1450-1521 | | ✓ | | Low | 0165-PG-001-GP-86-9011 | 1 | | | | | | | X | " " " |
| ~~004~~ | ~~1/25/86~~ | ~~1521~~ | ~~SS~~ | ~~G~~ | | ~~Low~~ | ~~0165-PG-004-GP-86-9011~~ | ~~8~~ | ~~8~~ | ~~1~~ | ~~1~~ | ~~1~~ | ~~1~~ | ~~1~~ | ~~1~~ | ~~DUP~~ |
| 002 | 1/25/86 | 1037-1621 | | | | | | | | | | | | | | DUP |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| Don Smith | 1/25/86 1930 | Federal Express | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: Federal Express

BL/Airbill Number: 891035390

Date: 9-25-86

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

*See CONCENTRATION RANGE on back of form.

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Rose AFB IRP | M. Bennik |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. Bennik |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Pollutable Organics | Oil & Grease | Phenols | BNA | TOX | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 004 | 8/26/86 | 1428 1520 | | X | | Low | 0165-RG-004-GP-86-5073 | 2 | X | | | | | | |
| 004 | 8/26/86 | 1428 1520 | | X | | Low | 0165-RG-004-GP-86-5073 | 1 | | X | | | | | |
| 004 | 8/26/86 | 1428 1520 | | X | | Low | 0165-RG-004-GP-86-5073 | 1 | | | X | | | | |
| 004 | 8/26/86 | 1428 1520 | | X | | Low | 0165-RG-004-GP-86-5073 | 1 | | | | X | | | |
| 004 | 8/26/86 | 1428 1520 | | X | | Low | 0165-RG-004-GP-86-5073 | 1 | | | | | X | | |
| 004 | 8/26/86 | 1428 1520 | | X | | Low | 0165-RG-004-GP-86-5073 | 1 | | | | | | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 8/26/86 1700 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | |
| | | | | | | BL/Airbill Number: 891 034 561 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/26/86 |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BRUNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. BRUNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Pesticides | BNA | TDS | Mercury/Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 8/16 | 1245-1316 | | X | | Low | 0165-16-001-GP-86-5010 | 2 | X | | | | | | |
| 001 | 8/16 | 1245-1316 | | X | | Low | 0165-16-001-GP-86-5010 | 1 | | X | | | | | |
| 001 | 8/16 | 1245-1316 | | X | | Low | 0165-16-001-GP-86-5010 | 1 | | | X | | | | |
| 001 | 8/16 | 1245-1316 | | X | | Low | 0165-16-001-GP-86-5010 | 1 | | | | X | | | |
| 001 | 8/16 | 1245-1316 | | X | | Low | 0165-16-001-GP-86-5010 | 1 | | | | | X | | |
| 001 | 8/16 | 1245-1316 | | X | | Low | 0165-16-001-GP-86-5010 | 1 | | | | | | X | |
| 002 | 8/16 | 1120-1151 | | X | | Low | 0165-16-002-GP-86-5031 | 2 | X | | | | | | |
| 002 | 8/16 | 1120-1151 | | X | | Low | 0165-16-002-GP-86-5031 | 1 | | X | | | | | |
| 002 | 8/16 | 1120-1151 | | X | | Low | 0165-16-002-GP-86-5031 | 1 | | | X | | | | |
| 002 | 8/16 | 1120-1151 | | X | | Low | 0165-16-002-GP-86-5031 | 1 | | | | X | | | |
| 002 | 8/16 | 1120-1151 | | X | | Low | 0165-16-002-GP-86-5031 | 1 | | | | | X | | |
| 002 | 8/16 | 1120-1151 | | X | | Low | 0165-16-002-GP-86-5031 | 1 | | | | | | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Donald W. Brown | 8/16/86 1700 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891034550 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/21/86 |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Phenols | Base Neutral Acid | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/15/86 | 1130-1158 | | X | | Low | 0165-P6-008-GP-86-5114 | 2 | X | | | | | |
| 008 | 8/15/86 | 1130-1158 | | X | | Low | 0165-P6-008-GP-86-5114 | 1 | | X | | | | |
| 008 | 8/15/86 | 1130-1158 | | X | | Low | 0165-P6-008-GP-86-5114 | 1 | | | X | | | |
| 008 | 8/15/86 | 1130-1158 | | X | | Low | 0165-P6-008-GP-86-5114 | 1 | | | | X | | |
| 008 | 8/15/86 | 1130-1158 | | X | | Low | 0165-P6-008-GP-86-5114 | 1 | | | | | X | |
| 008 | 8/15/86 | 1214-1229 | | X | | Low | 0165-P6-008-GP-86-5115 | 2 | X | | | | | |
| 008 | 8/15/86 | 1214-1229 | | X | | Low | 0165-P6-008-GP-86-5115 | 1 | | X | | | | |
| 008 | 8/15/86 | 1214-1229 | | X | | Low | 0165-P6-008-GP-86-5115 | 1 | | | X | | | |
| 008 | 8/15/86 | 1214-1229 | | X | | Low | 0165-P6-008-GP-86-5115 | 1 | | | | X | | |
| 008 | 8/15/86 | 1214-1229 | | X | | Low | 0165-P6-008-GP-86-5115 | 1 | | | | | X | |
| 008 | 8/18/86 | 1052-1237 | | X | | Low | 0165-P6-008-GP-86-5089 | 1 | X | | | | | 1 VOA shipped 8/18/86 Rec'd Buffalo 8/19/86 |
| 005 | 8/18/86 | 1052-1237 | | X | | Low | 0165-P6-005-GP-86-5089 | 1 | | | X | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 8-19-86/1200 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891034572 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/19/86 |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M BENNER |
| Samplers: (Signature) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION SAMPLE NUMBER | NUMBER OF CONTAINERS | Pesticide Organics | Oil & Grease | Phenols | Base Neutral Acids | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/16/86 | 1519 | | X | | Low | 0165-PG-008-GP-86-5112 | 1 | | | | | X | 6 |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5088 | 2 | X | | | | | |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5088 | 1 | | X | | | | |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5088 | 1 | | | X | | | |
| 005 | 8/16/86 | 1652 1737 | | X | | " | 0165-PG-005-GP-86-5088 | 1 | | | | X | | |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5088 | 1 | | | | | X | |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5089 | 2 | X | | | | | |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5089 | 1 | | X | | | | |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5089 | 1 | | | X | | | |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5089 | 1 | | | | X | | |
| 005 | 8/16/86 | 1652 1737 | | X | | Low | 0165-PG-005-GP-86-5089 | 1 | | | | | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| | 8/16/86 1900 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891034605 Date: 8/18/86 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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Page 1 of 1

## CHAIN-OF-CUSTODY RECORD

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-7000 | Reese AFB IRP | M. Benner |
| Samplers: (Signatures) | | Field Team Leader: M. Benner |

| Site STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION- | NUMBER OF CONTAINERS | Purgeable Aromatics | Oil & Grease | Phenols | Base/Neutrals/Acid | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/18/86 | 1545 1618 | | X | | Low | 0165-PG-008-GP-86-5113 | 2 | X | | | | | |
| 008 | 8/18/86 | 1545 1618 | | X | | Low | 0165-PG-008-GP-86-5113 | 1 | | X | | | | |
| 008 | 8/18/86 | 1545 1618 | | X | | Low | 0165-PG-008-GP-86-5113 | 1 | | | X | | | |
| 008 | 8/18/86 | 1545 1618 | | X | | Low | 0165-PG-008-GP-86-5113 | 1 | | | | X | | |
| 008 | 8/18/86 | 1545 1618 | | X | | Low | 0165-PG-008-GP-86-5113 | 1 | | | | | X | |
| 008 | 8/18/86 | 1420 1438 | | X | | Low | 0165-PG-008-GP-86-5111 | 2 | X | | | | | |
| 008 | 8/18/86 | 1420 1438 | | X | | Low | 0165-PG-008-GP-86-5111 | 1 | | X | | | | |
| 008 | 8/18/86 | 1420 1438 | | X | | Low | 0165-PG-008-GP-86-5111 | 1 | | | X | | | |
| 008 | 8/18/86 | 1420 1438 | | X | | Low | 0165-PG-008-GP-86-5111 | 1 | | | | X | | |
| 008 | 8/18/86 | 1420 1438 | | X | | Low | 0165-PG-008-GP-86-5111 | 1 | | | | | X | |
| 008 | 8/18/86 | 1501 1519 | | X | | Low | 0165-PG-008-GP-86-5112 | 2 | X | | | | | |
| 008 | 8/18/86 | 1501 1519 | | X | | Low | 0165-PG-008-GP-86-5112 | 1 | | X | | | | |
| 008 | 8/18/86 | 1501 1519 | | X | | Low | 0165-PG-008-GP-86-5112 | 1 | | | X | | | |
| 008 | 8/18/86 | 1501 1519 | | X | | Low | 0165-PG-008-GP-86-5112 | 1 | | | | X | | |
| 008 | 8/18/86 | 1501 1519 | | X | | Low | 0165-PG-008-GP-86-5112 | 1 | | | | | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: Federal Express |
|---|---|---|---|---|---|---|
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891034594 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/18/86 |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | Reese AFB IRP | M. Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| Donald M Smith | | M Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | SAMPLES FOR ARCHIVING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 006 | 2/11/86 | | | ✓ | | Boring Soil samples From B-1 | | 2 | X | |
| 006 | 2/11/86 | | | ✓ | | Boring Soil samples From B-2 | | 3 | X | |
| 008 | 2/12/86 | | | ✓ | | Boring Soil samples From B-1 | | 3 | X | |
| 008 | 2/12/86 | | | ✓ | | Boring Soil samples From B-2 | | 2 | X | |
| 002 | 2/13/86 | | | ✓ | | ~~Split~~ Soil Samples; 10', 15', 20', 45', 50' | | 5 | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| Donald M Smith | 2/14/86 11:30 | Federal EXPRESS | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: Federal EXPRESS

BL/Airbill Number: 891-034-642

Date: 2/14/86

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| IF2000 | Reese AFB IRP | M. Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. Benner |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | Samples for Archive | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 8/4/86 | | | V | | Well Samples W 01 125'-180' | | 1 Box | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| Donald M Smith | 8/19/86 1800 | Federal EXPRESS | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: FEDERAL EXPRESS

BL/Airbill Number: 891-034-631

Date: 8/4/86

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF 2000 | Reese AFB IRP | M. Benner |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. Benner |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | Samples for Archiving | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| C02 | 8/13/86 | | | V | | Well samples W01 5'-60' | | 1 Box | X | |
| 002 | 8/14/86 | | | V | | Well samples W01 65'-120' | | 1 Box | X | |
| ~~002~~ | ~~8/14/86~~ | | | ~~V~~ | | ~~Well samples W01 125'-180'~~ | DUP | 1 Box | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Donald M Smith | 8/14/86 1800 | Federal EXPRESS | | | | Federal EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891-034-620 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/14/86 |

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# CHAIN-OF-CUSTODY RECORD



Project No.: DF-2000
Project Name: REESE AFB IRP
Project Manager: M BENNER
Samplers: (Signatures)
Field Team Leader: M BENNER

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER -STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLS | EP TOXICITY | IGNITABILITY | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 8/3/86 | 1036 | X | | | Low | 0165-SO-002-GS-86-9183 | 2 | | | | X | X | ** |
| 002 | 8/3/86 | 0918 | | X | | Low | 0165-SO-002-GS-86-9043 | 2 | X | | | | | |
| 002 | 8/3/86 | 0918 | | X | | Low | 0165-SO-002-GS-86-9043 | 1 | | X | X | | | |
| 002 | 8/3/86 | 0916 | | X | | Low | 0165-SO-002-GS-86-9042 | 2 | X | | | | | |
| 002 | 8/3/86 | 0916 | | X | | Low | 0165-SO-002-GS-86-9042 | 1 | | X | X | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| [signature] | 8/4/86 1630 | [signature] | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
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| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |
| | | | | | |

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Date: 8/8/86

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRA | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | PCB/CHLORINATED ORGANICS | OIL & GREASE | PHENOLS | ARSENIC | EP TOXICITY | IGNITABILITY | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/22/86 | 0926 0928 | | X | | Low | 0165-SO-008-GS-86-9105 | 2 | X | | | | | | |
| 008 | 8/22/86 | 0926 0928 | | X | | Low | 0165-SO-008-GS-86-9105 | 1 | | X | X | X | | | |
| 008 | 8/22/86 | 0926 0928 | | X | | Low | 0165-SO-008-GS-86-9139 | 2 | X | | | | | | |
| 008 | 8/22/86 | 0926 0928 | | X | | Low | 0165-SO-008-GS-86-9139 | 1 | | X | X | X | | | |
| 008 | 8/22/86 | 0937 1121 | X | | | Low | 0165-SO-008-GS-86-9182 | 2 | | | | | X | X | |
| 008 | 8/22/86 | 1037 | | X | | Low | 0165-SO-008-GS-86-9106 | 2 | X | | | | | | |
| 008 | 8/22/86 | 1037 | | X | | Low | 0165-SO-008-GS-86-9106 | 1 | | X | X | X | | | |
| 008 | 8/22/86 | 1159 | | X | | Low | 0165-SO-008-GS-86-9107 | 2 | X | | | | | | |
| 008 | 8/22/86 | 1159 | | X | | Low | 0165-SO-008-GS-86-9107 | 1 | | X | X | X | | | |
| 008 | 8/22/86 | 1300 1427 | X | | | Low | 0165-SO-008-GS-86-9181 | 2 | | | | | X | X | |
| 008 | 8/22/86 | 1251 | | X | | Low | 0165-SO-008-GS-86-9108 | 2 | X | | | | | | |
| 008 | 8/22/86 | 1251 | | X | | Low | 0165-SO-008-GS-86-9108 | 1 | | X | X | X | | | |
| 008 | 8/22/86 | 1341 | | X | | Low | 0165-SO-008-GS-86-9109 | 2 | X | | | | | | |
| 008 | 8/22/86 | 1341 | | X | | Low | 0165-SO-008-GS-86-9109 | 1 | | X | X | X | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 8/22/86 1700 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891034675 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/22/86 |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-1000 | Reese AFB IRP | M. Bender |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. Bender |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLS | ARSENIC | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/8/88 | 1414 | | X | | Lew | 0165-SO-OOL-GS-86-9110 | 2 | X | | | | |
| 008 | 8/8/88 | 1414 | | X | | Lew | 0165-SO-OOL-GS-86-9116 | 1 | | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 8/8/88 1700 | Fedex-Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891034675 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/8/88 |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLS | CHROMIUM | LEAD | EP TOXICITY | IGNITABILITY | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 006 | 8/11/86 | 1106 | | X | | Low | 0165-SO-006-GS-86-9049 | 2 | X | | | | | | | |
| 006 | 8/11/86 | 1106 | | X | | Low (pH 6.5) | 0165-SO-006-GS-86-9049 | 1 | | X | X | X | X | | | |
| 006 | 8/11/86 | 1224 1230 | | X | | Low | 0165-SO-006-GS-86-9050 | 2 | X | | | | | | | |
| 006 | 8/11/86 | 1224 1230 | | X | | Low | 0165-SO-006-GS-86-9050 | 1 | | X | X | X | X | | | |
| 006 | 8/11/86 | 1247 | | X | | Low | 0165-SO-006-GS-86-9051 | 2 | X | | | | | | | |
| 006 | 8/11/86 | 1247 | | X | | Low | 0165-SO-006-GS-86-9051 | 1 | | X | X | X | X | | | |
| 006 | 8/11/86 | 1317 | | X | | Low | 0165-SO-006-GS-86-9052 | 2 | X | | | | | | | |
| 006 | 8/11/86 | 1317 | | X | | Low | 0165-SO-006-GS-86-9052 | 1 | | X | X | X | X | | | |
| 006 | 8/11/86 | 1224 1230 | | X | | Low | 0165-SO-006-GS-86-9144 | 2 | X | | | | | | | |
| 006 | 8/11/86 | 1224 1230 | | X | | Low | 0165-SO-006-GS-86-9144 | 1 | | X | X | X | X | | | |
| 006 | 8/11/86 | 1335 1330 | X | | | Low | 0165-SO-006-GS-86-9179 | 2 | | | | | | X | X | |
| 006 | 8/11/86 | | X | | | Low | 0165-SO-006-GS-86-9180 | 2 | | | | | | X | X | |
| 006 | 8/11/86 | 1616 | | X | | Low | 0165-SO-006-GS-86-9053 | 2 | X | | | | | | | |
| 006 | 8/11/86 | 1616 | | X | | Low | 0165-SO-006-GS-86-9053 | 1 | | X | X | X | X | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| | 8/11/86 1500 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/11/86 |

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## CHAIN-OF-CUSTODY RECORD

Page 2 of 2

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-7000 | Reese AFB IRP | M. Beaver |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. Beaver |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Phenols | Chromium | Lead | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 006 | 8/1/86 | 1648 | | X | | ~~0165-So-006-65-86-mp~~ Low | 0165-So-006-65-86-9054 | 2 | X | | | | | | | |
| 006 | 8/1/86 | 1648 | | X | | Low | 0165-So-006-65-86-9054 | 1 | | X | X | X | X | | | |
| 006 | 8/1/86 | 1711 | | X | | Low | 0165-So-006-65-86-9055 | 2 | X | | | | | | | |
| 006 | 8/1/86 | 1711 | | X | | Low | 0165-So-006-65-86-9055 | 1 | | X | X | X | X | | | |
| ~~006~~ | ~~8/1/86~~ | | | X | | ~~Low~~ | ~~0165-So-006-65-86-9056~~ | ~~2~~ | X | | | | | | | mp |
| 006 | 8/1/86 | | | X | | Low | 0165-So-006-65-86-9056 | 1 | | X | X | X | X | | | mp |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| | 8/1/86 1900 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/1/86 |

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NOTE: 0165-So-002-65-86-9027
9025
Sent but not on COC

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | Ross AFB IRP | M. Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| M [illegible]<br>A Peloquin | | M. Benner |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 004 | 8/6/86 | | | | | Samples For Archiving | WELL 01 SITE 04 50-185' | 1 Bot | Samples For Archiving |
| 004 | 8/6/86 | | | | | Samples For Archiving | SITE 005 well 01 85-115' | 1 bot | " |
| 005 | 8/6/86 | | | | | | SITE 004 well 01 Surf-40' | | " |
| 005 | 8/6/86 | | | | | Samples For Archiving | Site 005 well 01 Surf-80' | 1 bot | " |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| [illegible] | 8/7/86 1200 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891 0311 7115 Date: 8/8/86 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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# CHAIN-OF-CUSTODY RECORD



| Project No. | Project Name | Project Manager |
|---|---|---|
| DF-2000 | Reese AFB IRP | M. Benner |
| Samplers: (Signatures) | | Field Team Leader: M. Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE: COMP | SAMPLE TYPE: GRAB | SAMPLE TYPE: AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 004 | 8/24/8 | | | | | | SITE 004 Well at 45-73' | 1 bot | Samples For Archiving |
| 007 | 8/8 | | | | | | SITE 007 Bldg 1234 | 1 bot | " " " |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 8/24 1200 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 871034745 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/7/86 |

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# CHAIN-OF-CUSTODY RECORD



Project No.: DF-7000
Project Name: REESE AFB IRP
Project Manager: M. BENNER
Samplers: (Signatures)
Field Team Leader: M. BENNER

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgable Organics | Oil & Grease | BNA | Organochlor. Pest/PCB | Chlorinated Benz. | Phenols | TDS | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 9/1/86 | 0854 0907 | | X | | 0/10ppm on OVA | 0165-SO-001-GS-86-5007 | 2 | X | | | | | | | | |
| 001 | 9/1/86 | 0854 0907 | | X | | " | 0165-SO-001-GS-86-5007 | 1 | | X | X | X | X | X | | | |
| 002 | 9/1/86 | 1204 1220 | | X | | 10-20 ppm on OVA | 0165-MP-002-GW-86-5029 | 2 | X | | | | | | | | |
| 002 | 9/1/86 | 1204 1220 | | X | | water from Seneca Lake | 0165-MP-002-GW-86-5029 | 1 | | X | | | | | | | |
| 002 | 9/1/86 | 1204 1220 | | X | | " | 0165-MP-002-GW-86-5029 | 1 | | | X | | | | | | |
| 002 | 9/1/86 | 1204 1220 | | X | | " | 0165-MP-002-GW-86-5029 | 1 | | | | X | X | X | | | |
| 002 | 9/1/86 | 1204 1220 | | X | | " | 0165-MP-002-GW-86-5029 | 1 | | | | | | | X | | |
| 002 | 9/1/86 | 1204 1220 | | X | | " | 0165-MP-002-GW-86-5029 | 1 | | | | | | | | X | |
| 002 | 9/1/86 | 1204 1220 | | X | | " | 0165-MP-002-GW-86-5029 | 1 | | | | | | | | | X |
| 002 | 9/1/86 | 1307 1330 | | X | | " <10 on OVA | 0165-MP-002-GW-86-5030 | 2 | X | | | | | | | | |
| 002 | 9/1/86 | 1307 1330 | | X | | " | 0165-MP-002-GW-86-5030 | 1 | | X | | | | | | | |
| 002 | 9/1/86 | 1307 1330 | | X | | " | 0165-MP-002-GW-86-5030 | 1 | | | X | | | | | | |
| 002 | 9/1/86 | 1307 1330 | | X | | " | 0165-MP-002-GW-86-5030 | 1 | | | | X | X | X | | | |
| 002 | 9/1/86 | 1307 1330 | | X | | " | 0165-MP-002-GW-86-5030 | 1 | | | | | | | X | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
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| | 9/1/86 1600 | Federal Express | | | |
| | | | | | |
| | | Received For Laboratory By: (Signature) | | | Received For Laboratory By: (Signature) |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Rees AFB IRP 2 | M. Bennett |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. Bennett |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | BNA | ORGANOCHLOR. PEST/PCB | ORGANOPHOS. PEST | CHLORINATED HERB. | PHENOLS | TDS | PRIMARY METALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 8/16 | 1307 1330 | | X | | water from Sewage Lake | 0165-NP-002-GW-86-9000 | 1 | | | | | | | X | | | |
| 002 | 8/16 | 1307 1330 | | X | | " | 0165-NP-002-GW-86-9030 | 1 | | | | | | | | X | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| | 8/16 1500 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891 034 760 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/16 |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | M Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Polynuclear Aromatic Hydrocarbons | Organonitrogen Pest. | Organophos. Pest. | Chlorinated Herb. | E.P. Toxicity Metals | Drinking Water Metals | Cyanide | Lead | Petroleum Organics | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 003 | 8/3/86 | 1527 1616 | X | | | Low | 0165-So-003-GS-86-9173 | 2 | | | | | | | | X | X | | | |
| 003 | 8/3/86 | 0805 | | X | | Low | 0165-So-003-GS-86-9058 | 2 | X | | | | | | | | | | | |
| 003 | 8/3/86 | 0805 | | X | | Low | 0165-So-003-GS-86-9058 | 1 | | X | | | | | | X | X | X | | |
| 003 | 8/3/86 | 0751 | | X | | Low | 0165-So-003-GS-86-9057 | 2 | X | | | | | | | | | | | |
| 003 | 8/3/86 | 0751 | | X | | Low | 0165-So-003-GS-86-9057 | 1 | | X | | | | | | X | X | X | | |
| 003 | 8/3/86 | 0816 | | X | | Low | 0165-So-003-GS-86-9059 | 2 | X | | | | | | | | | | | |
| 003 | 8/3/86 | 0816 | | X | | Low | 0165-So-003-GS-86-9059 | 1 | | X | | | | | | X | X | X | | |
| 003 | 8/3/86 | 0855 | | X | | Low | 0165-So-003-GS-86-9060 | 2 | X | | | | | | | | | | | |
| 003 | 8/3/86 | 0855 | | X | | Low | 0165-So-003-GS-86-9060 | 1 | | X | | | | | | X | X | X | | |
| 007 | 8/5/86 | 1445 1206 | X | | | Low | 0165-So-007-GS-86-9176 | 2 | | | | | | | | X | X | | | |
| 007 | 8/5/86 | 1539 1634 | X | | | Low | 0165-So-007-GS-86-9179 | 2 | | | | | | | | X | X | | | |
| 007 | 8/5/86 | 1538 1634 | X | | | Low | 0165-So-007-GS-86-9178 | 2 | | | | | | | | X | X | | | |
| 007 | 8/5/86 | 1324 1414 | X | | | Low | 0165-So-007-GS-86-9177 | 2 | | | | | | | | X | X | | | |
| 007 | 8/5/86 | 0827 0535 | X | | | Low | 0165-So-007-GS-86-9175 | 2 | | | | | | | | X | X | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| | 8/5/86 2000 | Federal Express | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

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BL/Airbill Number: 891 034 524

Date: 8/5/86

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IFC | M. BENNER |

Samplers: (Signatures)

Field Team Leader: M. BENNER

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Polynuclear Aromatic Hydrocarbons | Organochlor. Pesticides | Organophos. Pest. | Chlorinated Herb. | Primary Metals | EP Toxics | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 004 | 8/5/86 | 1103 | | X | | Low | 0165-SO-004-GS-86-9084 | 2 | X | | | | | | | | | |
| 004 | 8/5/86 | 1103 | | X | | Low | 0165-SO-004-GS-86-9084 | 1 | | X | | X | X | X | X | | | |
| 007 | 8/5/86 | 1531 | | X | | Low | 0165-SO-007-GS-86-9102 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1531 | | X | | Low | 0165-SO-007-GS-86-9102 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1548 | | X | | Low | 0165-SO-007-GS-86-9103 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1548 | | X | | Low | 0165-SO-007-GS-86-9103 | 1 | | X | X | | | | | | | |
| 004 | 8/5/86 | 1133 | | X | | Low | 0165-SO-004-GS-86-9086 | 2 | X | | | | | | | | | |
| 004 | 8/5/86 | 1133 | | X | | Low | 0165-SO-004-GS-86-9086 | 1 | | X | | X | X | X | X | | | |
| 004 | 8/5/86 | 1112 | | X | | Low | 0165-SO-004-GS-86-9085 | 2 | X | | | | | | | | | |
| 004 | 8/5/86 | 1112 | | X | | Low | 0165-SO-004-GS-86-9085 | 1 | | X | | X | X | X | X | | | |
| 007 | 8/5/86 | 1425 1637 | | X | | Low | 0165-SO-007-GS-86-9138 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1425 1637 | | X | | Low | 0165-SO-007-GS-86-9138 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1356 | | X | | Low | 0165-SO-007-GS-86-9100 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1356 | | X | | Low | 0165-SO-007-GS-86-9100 | 1 | | X | X | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| | 8/5/86 2000 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | BL/Airbill Number: 891034524 / Date: 8/5/86 |

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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International Specialists in the Environment

# CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| Samplers: (Signature) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | Sample Number / STATION LOCATION | NUMBER OF CONTAINERS | Inorganic Chemicals | Oil + Grease | Polynuclear Aromatic Hydrocarbons | Organochlor. Pest/PCB | Organophos. Pest. | Chlorinated Herb. | Primary Metals | E.P. Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 007 | 8/5/86 | 1331 | | X | | Low | 0165-SO-007-GS-86-9059 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1331 | | X | | Low | 0165-SO-007-GS-86-9059 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1425 1431 | | X | | Low | 0165-SO-007-GS-86-9104 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1425 1431 | | X | | Low | 0165-SO-007-GS-86-9104 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1203 | | X | | Low | 0165-SO-007-GS-86-9098 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1203 | | X | | Low | 0165-SO-007-GS-86-9098 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1111 | | X | | Low | 0165-SO-007-GS-86-9097 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1111 | | X | | Low | 0165-SO-007-GS-86-9097 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1045 | | X | | Low | 0165-SO-007-GS-86-9096 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1045 | | X | | Low | 0165-SO-007-GS-86-9096 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 0933 | | X | | Low | 0165-SO-007-GS-86-9095 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 0933 | | X | | Low | 0165-SO-007-GS-86-9095 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 0920 | | X | | Low | 0165-SO-007-GS-86-9094 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 0920 | | X | | Low | 0165-SO-007-GS-86-9094 | 1 | | X | X | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| | 8/5/86 2000 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891 034 524 / Date: 8/5/86 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD

Page 4 of 4

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2aco | REESE AFB IRP | M BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Polynuclear Aromatic Hydrocarbons | Organochlor. Pest./PCB | Organophos. Pest. | Chlorinated Herb. | Primary Metals | E.P. Toxicity | IGNITABILITY | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 004 | 8/5/86 | 1320 | X | | | Low | 0165-SO-004-GS-86-9174 | 2 | | | | | | | | X | X | |
| 007 | 8/4/86 | 0856 | | X | | Low | 0165-SO-007-GS-86-9093 | 2 | X | | | | | | | | | |
| 007 | 8/4/86 | 0856 | | X | | Low | 0165-SO-007-GS-86-9093 | 1 | | X | X | | | | | | | |
| 007 | 8/4/86 | 1449 | | X | | Low | 0165-SO-007-GS-86-9101 | 2 | X | | | | | | | | | |
| 007 | 8/4/86 | 1449 | | X | | Low | 0165-SO-007-GS-86-9101 | 1 | | X | X | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
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| | 8/5/86 1000 | Federal Express | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: Federal Express

BL/Airbill Number: 851 031 524

Date: 8/5/86

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## CHAIN-OF-CUSTODY RECORD



Project No.: DF-2006
Project Name: REESE AFB IRP
Project Manager: M. BENNER
Samplers: (Signatures)
Field Team Leader: M. BENNER

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | PETROLEUM HYDROCARBONS | OIL & GREASE | CHROMIUM | LEAD | EP TOXICITY | IGNITABILITY | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 003 | 8/1/86 | 0751 | | X | | Low | 0165-SO-003-GS-86-9057 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 0751 | | X | | Low | 0165-SO-003-GS-86-9057 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 0805 | | X | | Low | 0165-SO-003-GS-86-9058 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 0805 | | X | | Low | 0165-SO-003-GS-86-9058 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 0816 | | X | | Low | 0165-SO-003-GS-86-9059 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 0816 | | X | | Low | 0165-SO-003-GS-86-9059 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 0855 | | X | | Low | 0165-SO-003-GS-86-9060 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 0855 | | X | | Low | 0165-SO-003-GS-86-9060 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 0903 0905 | X | | | Low | 0165-SO-003-GS-86-9168 | 2 | | | | | | X | X | |
| 003 | 8/1/86 | 1019 | | X | | Low | 0165-SO-003-GS-86-9161 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 1019 | | X | | Low | 0165-SO-003-GS-86-9161 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 1032 | | X | | Low | 0165-SO-003-GS-86-9162 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 1032 | | X | | Low | 0165-SO-003-GS-86-9162 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 1050 | | X | | Low | 0165-SO-003-GS-86-9163 | 2 | X | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
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| | 8/1/86 1400 | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

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Date: 8/1/86

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | PETROLEUM HYDROCARBONS | OIL & GREASE | CHROMIUM | LEAD | EP TOXICITY | IGNITABILITY | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 003 | 8/3/86 | 1050 | | X | | Low | 0165-So-003-GS-86-9063 | 1 | | X | X | X | X | | | |
| 003 | 8/3/86 | 1103 | | X | | Low | 0165-So-003-GS-86-9064 | 2 | X | | | | | | | |
| 003 | 8/3/86 | 1103 | | X | | Low | 0165-So-003-GS-86-9064 | 1 | | X | X | X | X | | | |
| 003 | 8/3/86 | 1141 | | X | | Low | 0165-So-003-GS-86-9143 | 2 | X | | | | | | | |
| 003 | 8/3/86 | 1141 | | X | | Low | 0165-So-003-GS-86-9143 | 1 | | X | X | X | X | | | |
| 003 | 8/3/86 | 1256 | | X | | Low | 0165-So-003-GS-86-9065 | 2 | X | | | | | | | |
| 003 | 8/3/86 | 1256 | | X | | Low | 0165-So-003-GS-86-9065 | 1 | | X | X | X | X | | | |
| 003 | 8/3/86 | 1306 | | X | | Low | 0165-So-003-GS-86-9066 | 2 | X | | | | | | | |
| 003 | 8/3/86 | 1306 | | X | | Low | 0165-So-003-GS-86-9066 | 1 | | X | X | X | X | | | |
| 003 | 8/3/86 | 1321 | | X | | Low | 0165-So-003-GS-86-9067 | 2 | X | | | | | | | |
| 003 | 8/3/86 | 1321 | | X | | Low | 0165-So-003-GS-86-9067 | 1 | | X | X | X | X | | | |
| 003 | 8/3/86 | 1336 | | X | | Low | 0165-So-003-GS-86-9068 | 2 | X | | | | | | | |
| 003 | 8/3/86 | 1336 | | X | | Low | 0165-So-003-GS-86-9068 | 1 | | X | X | X | X | | | |
| 003 | 8/3/86 | 1523 | | X | | Low | 0165-So-003-GS-86-9069 | 2 | X | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| [signature] | 8/4/86 1400 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891 034 513 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/1/86 |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Pesticides | Oil & Grease | Cadmium | Lead | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 003 | 8/1/86 | 1523 | | X | | Low | 0165-SO-003-GS-86-9169 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 1536 | | X | | Low | 0165-SO-003-GS-86-9170 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 1536 | | X | | Low | 0165-SO-003-GS-86-9170 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 1550 | | X | | Low | 0165-SO-003-GS-86-9171 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 1550 | | X | | Low | 0165-SO-003-GS-86-9171 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | KJ1 1130 | | X | | Low | 0165-SO-003-GS-86-9171 | 2 | | | | | | X | X | |
| 003 | 8/1/86 | KJ1 1130 | | X | | Low | 0165-SO-003-GS-86-9174 | 2 | | | | | | X | X | |
| 003 | 8/1/86 | 1141 | | X | | Low | 0165-SO-003-GS-86-9150 | 2 | X | | | | | | | |
| 003 | 8/1/86 | 1141 | | X | | Low | 0165-SO-003-GS-86-9150 | 1 | | X | X | X | X | | | |
| 003 | 8/1/86 | 1255 1339 | | X | | Low | 0165-SO-003-GS-86-9172 | 2 | | | | | | X | X | |
| 003 | 8/1/86 | 1524 1616 | | X | | Low | 0165-SO-003-GS-86-9173 | 2 | | | | | | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| | 8/1/86 1400 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891 034 513 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 8/1/86 |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Rome AFB IRP | M. Beaver |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. Beaver |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | BNA | Cadmium | Chromium | Lead | Nickel | Zinc | Oil & Grease | Organochlor. Pest/PCB | Organophos. Pest | Chlorinated Herb. | Primary Metals | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 005 | 8/2/86 | 0800 | | X | | Low - | 0165-So-005-GS-86-7090 | 2 | X | | | | | | | | | | | | | | |
| 005 | 8/2/86 | 0800 | | X | | Low | 0165-So-005-GS-86-7091 | 1 | | X | X | X | X | X | X | | | | | | | | |
| 005 | 8/2/86 | 0808 | | X | | Low | 0165-So-005-GS-86-7091 | 2 | X | | | | | | | | | | | | | | |
| 005 | 8/2/86 | 0808 | | X | | Low | 0165-So-005-GS-86-7091 | 1 | | X | X | X | X | X | X | | | | | | | | |
| 005 | 8/2/86 | 0940 | | X | | Low | 0165-So-005-GS-86-9092 | 2 | X | | | | | | | | | | | | | | |
| 005 | 8/2/86 | 0940 | | X | | Low | 0165-So-005-GS-86-7092 | 1 | | X | X | X | X | X | X | | | | | | | | |
| 004 | 8/2/86 | 1623 | | X | | Low | 0165-So-004-GS-86-9080 | 2 | X | | | | | | | | | | | | | | |
| 004 | 8/2/86 | 1623 | | X | | Low | 0165-So-004-GS-86-7080 | 1 | | | | | | | | X | X | X | X | X | | | |
| 004 | 8/2/86 | 0954 | | X | | Low | 0165-So-004-GS-86-7079 | 2 | X | | | | | | | | | | | | | | |
| 004 | 8/2/86 | 0954 | | X | | Low | 0165-So-004-GS-86-7079 | 1 | | | | | | | | X | X | X | X | X | | | |
| 004 | 8/2/86 | 0924 1036 | X | | | Low | 0165-So-004-GS-86-9179 7179 | 2 | | | | | | | | | | | | | X | X | |
| 005 | 8/2/86 | 1503 | X | | | Low | 0165-So-005-GS-86-7169 | 2 | | | | | | | | | | | | | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
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| | 8/2/86 1600 | Federal Express | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: Federal Express

BL/Airbill Number: 891 034 476

Date: 8/2/86

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## CHAIN-OF-CUSTODY RECORD

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| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2044 | REESE AFB IEP | M. BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| David Palmer | | M. Benner |

| SMC STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| 001 | | | | | | WELL 01 STRATIGRAPHIC SAMPLES. SURFACE TO 176 ft. | | 3 boxes | SAMPLES FOR ARCHIVING |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| D. Palmer | 8-22 1600 | [illegible] | | | | Federal Express |
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# CHAIN-OF-CUSTODY RECORD



Project No.: DF2000
Project Name: Reese AFB IRP
Project Manager: M. Benner
Samplers: (Signatures)
Field Team Leader: M. Benner

| Site STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | Sample ID STATION LOCATION | NUMBER OF CONTAINERS | SAMPLES FOR ARCHIVE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 7/25/86 | 0902 | | X | | | Boring 2 5-6.5' | 1 | X | For Storage Archive |
| 001 | 7/25/86 | 0913 | | X | | | Boring 2 10-11.5' | 1 | X | |
| 001 | 7/24/86 | 0930 | | X | | | Boring 2 20-21.5 | 1 | X | |
| 001 | 7/24/86 | 1158 | | X | | | Boring 1 1-2.5' | 1 | X | |
| 001 | 7/24/86 | 1311 | | X | | | Boring 1 10-11.5' | 1 | X | |
| 001 | 7/24/86 | 1356 | | X | | | Boring 1 20-21.5 | 1 | X | |
| 001 | 7/24/86 | 1421 | | X | | | Boring 1 25-26.5' | 1 | X | |
| 001 | 7/24/86 | 1246 | | X | | | Boring 3 1-2.5' | 1 | X | |
| 001 | 7/24/86 | 1321 | | X | | | Boring 3 10-11.5 | 1 | X | |
| 001 | 7/24/86 | 1400 | | X | | | Boring 3 20-21.5 | 1 | X | |
| 002 | 7/25/86 | 1411 | | X | | | Boring 3 5-6.5' | 1 | X | |
| 002 | 7/25/86 | 1450 | | X | | | Boring 3 10-14.5' | 1 | X | |
| 002 | 7/21/86 | 0815 | | X | | | Boring 2 1-2.5' | 1 | X | |
| 002 | 7/21/86 | 0909 | | X | | | Boring 2 10-11.5' | 1 | X | |
| 002 | 7/21/86 | 1148 | | X | | | Boring 2 5-6.5 | 1 | X | |
| 002 | 7/21/86 | 1157 | | X | | | Boring 2 10-11.5 | 1 | X | |

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| [signature] | 8/2/86 1600 | Federal Express | | | |
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| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: Federal Express
BL/Airbill Number: 891034454
Date: 8/2/86

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB - IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE ID ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | ARCHIVING | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 004 | 9/15/88 | 1312 | | X | | | Boring 01 5-6.5' | 1 | X | Samples For Archiving |
| 004 | 9/15/88 | 1321 | | X | | | Boring 01 10-11.5' | 1 | X | |
| 004 | 9/15/88 | 1358 | | X | | | Boring 01 20-21.5' | 1 | X | |
| 004 | 9/15/88 | 1420 | | X | | | Boring 01 25-26.5' | 1 | X | |
| 004 | 9/16/88 | 1001 | | X | | | Boring 03 1-2.5' | 1 | X | |
| 004 | 9/16/88 | 1022 | | X | | | Boring 03 10-11.5' | 1 | X | |
| 004 | 9/16/88 | 1059 | | X | | | Boring 03 20-21.5 | 1 | X | |
| 004 | 9/16/88 | 1118 | | X | | | Boring 03 25-26.5 | 1 | X | |
| 004 | 9/16/88 | 1621 | | X | | | Boring 02 1-2.5 | 1 | X | |
| 004 | 9/16/88 | 1637 | | X | | | Boring 02 10-11.5 | 1 | X | |

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| [signature] | 9/16/88 1600 | Federal Express | | | | Federal Express |
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| | | | | | | BL/Airbill Number: 891034154 |
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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DE 2000 | REESE AFB IRP | M. BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Aromatics | Oil & Grease | Base/Neutrals, Acid Extr. | Organochlor. Pesticides | Chlorinated Herbs. | Priority Metals | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 004 | 8/1/86 | 1004 1135 | X | | | Low | 0165-So-004-GS-86-9167 | 2 | | | | | | | X | X | |
| 004 | 8/1/86 | 1012 | | X | | Low | 0165-So-004-GS-86-9081 | 2 | X | | | | | | | | |
| 004 | 8/1/86 | 1012 | | X | | Low | 0165-So-004-GS-86-9081 | 1 | | X | X | X | X | X | | | |
| 004 | 8/1/86 | 1636 | | X | | Low | 0165-So-004-GS-86-9082 | 2 | X | | | | | | | | |
| 004 | 8/1/86 | 1636 | | X | | Low | 0165-So-004-GS-86-9082 | 1 | | X | X | X | X | X | | | |
| 004 | 8/1/86 | 1041 | | X | | Low | 0165-So-004-GS-86-9083 | 2 | X | | | | | | | | |
| 004 | 8/1/86 | 1041 | | X | | Low | 0165-So-004-GS-86-9083 | 1 | | X | X | X | X | X | | | |
| 004 | 8/1/86 | 1041 | | X | | Low | 0165-So-004-GS-86-9142 | 2 | X | | | | | | | | |
| 004 | 8/1/86 | 1041 | | X | | Low | 0165-So-004-GS-86-9142 | 1 | | X | X | X | X | X | | | |
| 004 | 8/1/86 | 1300 | | X | | Low | 0165-So-004-GS-86-9075 | 2 | X | | | | | | | | |
| 004 | 8/1/86 | 1300 | | X | | Low | 0165-So-004-GS-86-9075 | 1 | | X | X | X | X | X | | | |
| 004 | 8/1/86 | 1318 1583 | X | | | Low | 0165-So-004-GS-86-9168 | 2 | | | | | | | X | X | |
| 004 | 8/1/86 | 1450 | | X | | Low | 0165-So-004-GS-86-9077 | 2 | X | | | | | | | | |
| 004 | 8/1/86 | 1450 | | X | | Low | 0165-So-004-GS-86-9077 | 1 | | X | X | X | X | X | | | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Aromatics | Purg. Halocarbons | Base/Neutrals | Acids | Pesticides/PCBs | Priority Pollutant Metals | EP Toxicity | TCLP | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 004 | 8/1/88 | 1336 1338 | | X | | Lead | 011S-SO-004-GS-86-9076 | 2 | X | | | | | | | | |
| 004 | 8/1/88 | 1336 1338 | | X | | Lead | 011S-SO-004-GS-86-9078 | 1 | | X | X | X | X | X | | | |
| 004 | 8/1/88 | 1628 | | X | | Lead | 011S-SO-004-GS-86-9076 | 2 | X | | | | | | | | |
| 004 | 8/1/88 | 1628 | | X | | Lead | 011S-SO-004-GS-86-9078 | 1 | | X | X | X | X | X | | | |

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| | 8/1/88 1500 | Federal Express | | | | FEDERAL EXPRESS |
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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DE-2000 | REESE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLS | EP TOXICITY/IGNITABILITY | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 7/31/86 | 0857 | | X | | Low | 0165-SO-002-GS-86-9033 | 2 | X | | | | | | |
| 002 | 7/31/86 | 0857 | | X | | Low | 0165-SO-002-GS-86-9033 | 1 | | X | X | | | | |
| 002 | 7/31/86 | 0935 | | X | | Low | 0165-SO-002-GS-86-9034 | 2 | X | | | | | | |
| 002 | 7/31/86 | 0935 | | X | | Low | 0165-SO-002-GS-86-9034 | 1 | | X | X | | | | |
| 002 | 7/31/86 | 0856 | | X | | Low | 0165-SO-002-GS-86-9035 | 2 | X | | | | | | |
| 002 | 7/31/86 | 0856 | | X | | Low | 0165-SO-002-GS-86-9035 | 1 | | X | X | | | | |
| 002 | 7/31/86 | 0922 1006 | X | 1 | | Low | 0165-SO-002-GS-86-9164 | 2 | | | | X | | | |
| 002 | 7/31/86 | 1138 | | X | | Low | 0165-SO-002-GS-86-9036 | 2 | X | | | | | | |
| 002 | 7/31/86 | 1138 | | X | | Low | 0165-SO-002-GS-86-9036 | 1 | | X | X | | | | |
| 002 | 7/31/86 | 1212 | | X | | Low | 0165-SO-002-GS-86-9037 | 2 | X | | | | | | |
| 002 | 7/31/86 | 1212 | | X | | Low | 0165-SO-002-GS-86-9037 | 1 | | X | X | | | | |
| 002 | 7/31/86 | 1229 | | X | | Low | 0165-SO-002-GS-86-9038 | 2 | X | | | | | | |
| 002 | 7/31/86 | 1229 | | X | | Low | 0165-SO-002-GS-86-9038 | 1 | | X | X | | | | |
| 002 | 7/31/86 | 1152 1254 | X | | | Low | 0165-SO-002-GS-86-9165 | 1 | | | | X | | | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER — STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLS | EP TOX/TCLP/TCDD/TCDF | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 7/31/86 | 1427 | | X | | Low | 0165-So-002-GS-86-5035 | 2 | X | | | | |
| 002 | 7/31/86 | 1427 | | X | | Low | 0165-So-002-GS-86-5035 | 1 | | X | X | | |
| 002 | 7/31/86 | 1505 | | X | | Low | 0165-So-002-GS-86-5040 | 2 | X | | | | |
| 002 | 7/31/86 | 1505 | | X | | Low | 0165-So-002-GS-86-5040 | 1 | | X | X | | |
| 002 | 7/31/86 | 1529 | X | | | Low | 0165-So-002-GS-86-5166 | 1 | | | | X | |

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Date: 7-31-86

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## CHAIN-OF-CUSTODY RECORD

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| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | M. BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION / SAMPLE NUMBER | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | BNA | Organochlorine Pest/PCB | Organophos. Pest. | Chlorinated Herbicides | EP Tox & Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 7/2/86 | 1302 | | X | | | 0165-So-001-GS-86-9012 | 2 | X | | | | | | | |
| 001 | 7/2/86 | 1302 | | X | | | 0165-So-001-GS-86-9012 | 1 | | X | X | X | X | X | | |
| 001 | 7/2/86 | 1331 | | X | | | 0165-So-001-GS-86-9013 | 2 | X | | | | | | | |
| 001 | 7/2/86 | 1331 | | X | | | 0165-So-001-GS-86-9013 | 1 | | X | X | X | X | X | | |
| 001 | 7/2/86 | 1441 1445-1 | | X | | | 0165-So-001-GS-86-9014 | 2 | X | | | | | | | |
| 001 | 7/2/86 | 1441 1445-1 | | X | | | 0165-So-001-GS-86-9014 | 1 | | X | X | X | X | X | | |
| 001 | 7/2/86 | 1441 1445-1 | | X | | | 0165-So-001-GS-86-9141 | 2 | X | | | | | | | |
| 001 | 7/2/86 | 1441 1445-1 | | X | | | 0165-So-001-GS-86-9141 | 1 | | X | X | X | X | X | | |
| 001 | 7/2/86 | 1920 | | X | | | 0165-So-001-GS-86-9160 | 1 | | | | | | | X | |
| 001 | 7/2/86 | 1115 1118 | | X | | | 0165-So-001-GS-86-9161 | 1 | | | | | | | X | |
| 001 | 7/2/86 | 1155 1157 | | X | | | 0165-So-001-GS-86-9162 | 1 | | | | | | | X | |
| 001 | 7/2/86 | 1340 1917 | | X | | | 0165-So-001-GS-86-9163 | 1 | | | | | | | X | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

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| [signature] | 7/2/86 1730 | Federal Express | | | | Federal Express |
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| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 2

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | Reese AFB IRP | Michael E. Benner |
| Samplers: (Signatures) | | Field Team Leader: |
| | | Michael E. Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | B/NA | ORGANOCHLORINE PEST/PCB | ORGANOPHOSPHOROUS PEST. | CHLORINATED HERBICIDES | OIL & GREASE | PHENOLS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 7/24/96 | 0615 | | X | | Low - "0" on OVA | 0165-SO-001-GS-96-9015 | 2 | X | | | | | | | |
| 001 | 7/24/96 | 0649 | | X | | Low - "0" on OVA | 0165-SO-001-GS-96-9015 | 1 | | X | X | X | X | X | | |
| 001 | 7/24/96 | 0926 | | X | | Low - "0" on OVA | 0165-SO-001-GS-96-9016 | 2 | X | | | | | | | |
| 001 | 7/24/96 | 0926 | | X | | Low - "0" on OVA | 0165-SO-001-GS-96-9016 | 1 | | X | X | X | X | X | | |
| 001 | 7/24/96 | 1011 | | X | | Low - "0" on OVA | 0165-SO-001-GS-96-9017 | 2 | X | | | | | | | |
| 001 | 7/24/96 | 1011 | | X | | Low - "0" on OVA | 0165-SO-001-GS-96-9017 | 1 | | X | X | X | X | X | | |
| 001 | 7/24/96 | 1256 | | X | | 30ppm on OVA | 0165-SO-001-GS-96-9018 | 2 | X | | | | | | | |
| 001 | 7/24/96 | 1256 | | X | | 30ppm on OVA | 0165-SO-001-GS-96-9018 | 1 | | X | X | X | X | X | | |
| 001 | 7/24/96 | 1341 | | X | | Low - 0 on OVA | 0165-SO-001-GS-96-9019 | 2 | X | | | | | | | |
| 001 | 7/24/96 | 1341 | | X | | Low - 0 on OVA | 0165-SO-001-GS-96-9019 | 1 | | X | X | X | X | X | | |
| 001 | 7/24/96 | 1611 | | X | | Low - 0 on OVA | 0165-SO-001-GS-96-9020 | 2 | X | | | | | | | |
| 001 | 7/24/96 | 1611 | | X | | Low - 0 on OVA | 0165-SO-001-GS-96-9020 | 1 | | X | X | X | X | X | | |
| 001 | 7/24/96 | 1731 | | X | | Low | 0165-MP-001-GW-96-9005 | 1 | | | | | | | X | |
| 001 | 7/24/96 | 1010 | | X | | Low -0 on OVA | 0165-SO-001-GS-96-9023 | 2 | X | | | | | | | |

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| | 7/29/96 2016 | Federal Express | | | | Federal Express |
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| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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International Specialists in the Environment

## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | MICHAEL E. BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| David T. Wright J. Paul Kodyk | | MICHAEL E. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | BNA | ORGANOCHLORINE PEST/PCB | ORGANOPHOSPHORUS PEST | CHLORINATED HERBICIDES | OIL & GREASE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 1/29/86 | 1010 | | X | | LOW - 0 on OVA | 0165-SO-001-GS-86-9023 | 1 | | X | X | X | X | X | |
| 001 | 1/29/86 | 0922 | | X | | LOW - 0 on OVA | 0165-SO-001-GS-86-9021 | 2 | X | | | | | | |
| 001 | 1/29/86 | 0922 | | X | | LOW - 0 on OVA | 0165-SO-001-GS-86-9021 | 1 | | X | X | X | X | X | |
| 001 | 1/29/86 | 0944 | | X | | LOW - 0 on OVA | 0165-SO-001-GS-86-9022 | 2 | X | | | | | | |
| 001 | 1/29/86 | 0944 | | X | | LOW - 0 on OVA | 0165-SO-001-GS-86-9022 | 1 | | X | X | X | X | X | |
| 001 | 1/29/86 | 1235 | | X | | LOW - 0 on OVA | 0165-SO-001-GS-86-9024 | 2 | X | | | | | | |
| 001 | 1/29/86 | 1235 | | X | | LOW - 0 on OVA | 0165-SO-001-GS-86-9024 | 1 | | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Paul Kodyk | 1/29/86 @ 2016 | Federal Express | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | MIKE BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | MIKE BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | | Sample Number STATION LOCATION | NUMBER OF CONTAINERS | VOA | O.I & GREASE | BNA | ARSENIC | CADMIUM | LEAD | CHROME | COPPER | NICKEL | ZINC | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 009 | 7-3-86 | 1205 | X | | | Volatile Organics (Low) | 0-1' | 0165-50-009-GS-86-9116 | 2 4oz | X | | | | | | | | | | |
| | | 1205 | X | | | | 0-1' | 0165-50-009-GS-86-9116 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1205 | X | | | | 0-2' | 0165-50-009-GS-86-9117 | 2 4oz | X | | | | | | | | | | |
| | | 1205 | X | | | | 0-2' | 0165-50-009-GS-86-9117 | 1 8oz. | | X | X | X | X | X | X | X | X | X | |
| | | 1205 | X | | | | 0-2' | 0165-50-009-GS-86-9118 | 2 4oz | X | | | | | | | | | | |
| | | 1205 | X | | | | 0-2' | 0165-50-009-GS-86-9118 | 1 8oz. | | X | X | X | X | X | X | X | X | X | |
| | | 1545 | X | | | | 0-1' | 0165-50-009-GS-86-9119 | 2 4oz | X | | | | | | | | | | |
| | | 1545 | X | | | | 0-1' | 0165-50-009-GS-86-9119 | 1 8oz. | | X | X | X | X | X | X | X | X | X | |
| | | 1545 | X | | | | 0-2' | 0165-50-009-GS-86-9120 | 2 4oz | X | | | | | | | | | | |
| | | 1545 | X | | | | 0-2' | 0165-50-009-GS-86-9120 | 1 8oz. | | X | X | X | X | X | X | X | X | X | |
| | | 1100 | X | | | | 0-1' | 0165-50-009-GS-86-9121 | 2 4oz. | X | | | | | | | | | | |
| | | 1100 | X | | | | 0-1' | 0165-50-009-GS-86-9121 | 1 8oz. | | X | X | X | X | X | X | X | X | X | |
| | | 1100 | X | | | | 0-2' | 0165-50-009-GS-86-9122 | 2 4oz. | X | | | | | | | | | | |
| | | 1100 | X | | | | 0-2' | 0165-50-009-GS-86-9122 | 1 8oz. | | X | X | X | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| Paul Bratek | 7-3-86/1930 | FEDERAL EXPRESS | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

Ship Via: FEDERAL EXPRESS

BL/Airbill Number: 891034782

Date: 7-4-86

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | MIKE BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| [signature] Rod [illegible] | | MIKE BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | | Sample Number / STATION LOCATION | NUMBER OF CONTAINERS | VOA | O.I & Grease | BNA | Arsenic | Cadmium | Lead | Chrome | Copper | Nickel | Zinc | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 009 | 7-24-86 | 1311 | X | | | Volatile Organics (Low) | 0-1' | 0165-50-009-GS-86-9123 | 2 4oz | X | | | | | | | | | | |
| | | 1311 | X | | | | 0-1' | 0165-50-009-GS-86-9123 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1311 | X | | | | 0-2' | 0165-50-009-GS-86-9124 | 2 4oz | X | | | | | | | | | | |
| | | 1311 | X | | | | 0-2' | 0165-50-009-GS-86-9124 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1415 | X | | | | 0-1' | 0165-50-009-GS-86-9125 | 2 4oz | X | | | | | | | | | | |
| | | 1415 | X | | | | 0-1' | 0165-50-009-GS-86-9125 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1415 | X | | | | 0-2' | 0165-50-009-GS-86-9126 | 2 4oz | X | | | | | | | | | | |
| | | 1415 | X | | | | 0-2' | 0165-50-009-GS-86-9126 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1430 | X | | | | 0-1' | 0165-50-009-GS-86-9127 | 2 4oz | X | | | | | | | | | | |
| | | 1430 | X | | | | 0-1' | 0165-50-009-GS-86-9127 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1430 | X | | | | 0-2' | 0165-50-009-GS-86-9128 | 2 4oz | X | | | | | | | | | | |
| | | 1430 | X | | | | 0-2' | 0165-50-009-GS-86-9128 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1445 | X | | | | 0-1' | 0165-50-009-GS-86-9129 | 2 4oz | X | | | | | | | | | | |
| | | 1445 | X | | | | 0-1' | 0165-50-009-GS-86-9129 | 1 8oz | | X | X | X | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Paul Brodzik | 7-24-86/1700 | FEDERAL EXPRESS | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 59103178? / Date: 7-24-86 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | MIKE BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | MIKE BENNER |

| Site STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | VOA | Oil & Grease | BNA | Arsenic | Cadmium | Lead | Chromium | Copper | Nickel | Zinc | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 009 | 7-27-86 | 1445 | X | | | Volatile Organics (Low) 0-2' | 0165-50-009-GS-86-4130 | 2 4oz | X | | | | | | | | | | |
| | | 1445 | X | | | 0-2' | 0165-50-009-GS-86-4130 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1500 | X | | | 0-1' | 0165-50-009-GS-86-4131 | 2 4oz | X | | | | | | | | | | |
| | | 1500 | X | | | 0-1' | 0165-50-009-GS-86-4131 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1500 | X | | | 0-2' | 0165-50-009-GS-86-4132 | 2 4oz | X | | | | | | | | | | |
| | | 1500 | X | | | 0-2' | 0165-50-009-GS-86-4132 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1520 | X | | | 0-1' | 0165-50-009-GS-86-4133 | 2 4oz | X | | | | | | | | | | |
| | | 1520 | X | | | 0-1' | 0165-50-009-GS-86-4133 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1520 | X | | | 0-1' | 0165-50-009-GS-86-4134 | 2 4oz | X | | | | | | | | | | |
| | | 1520 | X | | | 0-1' | 0165-50-009-GS-86-4134 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1520 | X | | | 0-2' | 0165-50-009-GS-86-4135 | 2 4oz | X | | | | | | | | | | |
| | | 1520 | X | | | 0-2' | 0165-50-009-GS-86-4135 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1535 | X | | | 0-1' | 0165-50-009-GS-86-4136 | 2 4oz | X | | | | | | | | | | |
| | | 1535 | X | | | 0-1' | 0165-50-009-GS-86-4136 | 1 8oz | | X | X | X | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Paul Brady | 7-27-86/1900 | FEDERAL EXPRESS | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | BL/Airbill Number: 8910377782 / Date: 7-24-86 |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRT | MIKE BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | MIKE BENNER |

| Site STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | | STATION LOCATION | NUMBER OF CONTAINERS | VOA | Oil & Grease | BNA | Arsenic | Cadmium | Lead | Chrome | Copper | Nickel | Zinc | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 009 | 7-24-86 | 1535 | X | | | Volatile Organics (Low) | 0-2' | 0165-50-009-95-86-9137 | 2 4oz | X | | | | | | | | | | |
| ↓ | ↓ | 1535 | X | | | ↓ | 0-2' | 0165-50-009-95-86-9137 | 1 8oz | | X | X | X | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Paul Rodak | 7/24/86 1600 | FEDERAL EXPRESS | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | BL/Airbill Number: 891037762 / Date: 7-24-86 |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2060 | REESE AFB IRP | MICHAEL E. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | MICHAEL E. BENNER |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLICS | BASE/NEUTRAL/ACID EXTRACT. | ORGANOCHLORINE PESTICIDES/PCB | ORGANOPHOSPHOROUS PESTICIDES | CHLORINATED HERBICIDES | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 6/26/86 | 1125 1200 | | X | | Low | 0165-SO-001-GS-86-9001 | 2 | X | | | | | | | |
| 001 | 6/26/86 | 1125 1200 | | X | | Low + MD Medium | 0165-SO-001-GS-86-9001 | 1 | | X | X | X | X | X | X | |
| 001 | 6/26/86 | 1125 1200 | | X | | Low + Medium | 0165-SO-001-GS-86-9002 | 2 | X | | | | | | | |
| 001 | 6/26/86 | 1125 1200 | | X | | Low | 0165-SO-001-GS-86-9002 | 1 | | X | X | X | X | X | X | |
| 001 | 6/26/86 | 1050 1101 | | X | | Low | 0165-SO-001-GS-86-9003 | 2 | X | | | | | | | |
| 001 | 6/26/86 | 1050 1101 | | X | | Low | 0165-SO-001-GS-86-9003 | 1 | | X | X | X | X | X | X | |
| 001 | 6/26/86 | 1445 1457 | | X | | Low | 0165-SO-001-GS-86-9004 | 2 | X | | | | | | | |
| 001 | 6/26/86 | 1445 1457 | | X | | Low | 0165-SO-001-GS-86-9004 | 1 | | X | X | X | X | X | X | |
| 002 | 6/26/86 | 1542 1556 | | X | | Low | 0165-SO-002-GS-86-9025 | 2 | X | | | | | | | |
| 002 | 6/26/86 | 1542 1556 | | X | | Low | 0165-SO-002-GS-86-9025 | 1 | | X | X | X | X | X | X | |
| 002 | 6/26/86 | 1553 1624 | | X | | Low | 0165-SO-002-GS-86-9026 | 2 | X | | | | | | | |
| 002 | 6/26/86 | 1553 1624 | | X | | Low | 0165-SO-002-GS-86-9026 | 1 | | X | X | X | X | X | X | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 6/26/86 1900 | FedEX | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891 033 760 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 6/26/86 |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | MICHAEL E. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | MICHAEL E. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION Number ~~EXPECTED COMPOUNDS (Concentration)*~~ | ~~STATION LOCATION~~ Expected concentration* | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Phenols | Base/Neutral/Acid Extractables | Chlorinated Pesticides/PCB | Organophosphorus Pesticides | Halogenated Herbicides | Primary Metals | Total Dissolved Solids | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 6/26/86 | 1226 1305 | | X | | 0165-NP-001-GN-86-9005 | ~~Low~~ Medium | 2 | X | | | | | | | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9005 | ~~Low~~ Medium | 1 | | X | | | | | | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9005 | ~~Low~~ Medium | 1 | | | X | | | | | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9005 | ~~Low~~ Medium | 1 | | | | | | | | | X | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9005 | Low | 2 | | | | X | | | | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9005 | Low | 2 | | | | | X | X | X | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9005 | Low | 1 | | | | | | | | X | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9006 | ~~Low~~ Medium | 2 | X | | | | | | | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9006 | ~~Low~~ Medium | 1 | | X | | | | | | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9006 | ~~Low~~ Medium | 1 | | | X | | | | | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9006 | Low | 2 | | | | X | | | | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9006 | Low | 2 | | | | | X | X | X | | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9006 | Low | 1 | | | | | | | | X | | |
| 001 | 6/26/86 | 1226 1305 | | | | 0165-NP-001-GN-86-9006 | ~~Low~~ MEDIUM | 1 | | | | | | | | | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 6/26 1900 | Federal Express | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891033776 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 6/26/86 |

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# CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB-IRP | Michael E. Benner |
| Samplers: (Signatures) | | Field Team Leader: |
| | | Michael E. Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Purgable Organics | Oil & Grease | Phenols | Chromium | Lead | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 006 | 6/26/86 | 1454 1700 | | X | | Low | 0165-SO-006-GS-86-9048 | 2 | X | | | | | |
| 006 | 6/26/86 | 1451 1700 | | X | | Low | 0165-SO-006-GS-86-9048 | 1 | | X | X | X | X | |
| 006 | 6/26/86 | 1451 1700 | | X | | Low | 0165-SO-006-GS-86-9047 | 2 | X | | | | | |
| 001 | 6/26/86 | 1454 1700 | | X | | Low | 0165-SO-001-GS-86-9047 | 1 | | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| [signature] | 6/26 1900 | Federal Express | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891 033 780 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 6/26/86 |

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AFS#1.6

## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | Mike Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| Bill Parr Alan Squire | | Mike Benner |

| SAC STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION — Sample Number | NUMBER OF CONTAINERS | VOA | Oil & Grease | Phenols | BNA | Pr. Mary Metal | TDS | Pesticides/PCB | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 005 | 9/26 | 0638 0733 | | X | | Low T 67.4°F Cond 1303 PH 6.6 | 0165-PG-005-GP-SS-9140 | 6 | 2 | 1 | 1 | 1 | 1 | | | |
| 002 | 9/26 | 0730 0807 | | X | | Low T [illegible] 70.1 Cond 405 PH 8.37 | 0165-NP-002-GN-SS-9044 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 002 | 9/26 | 0850 0905 | | X | | Low T 71.5°F Cond. 312 PH 7.06 | 0165-NP-002-GN-SS-9045 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 001 | 9/26 | 0915 0925 | | X | | Low T 70.6°F Cond. 203 PH 8.33 | 0165-NP-001-GN-SS-9008 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 001 | 9/26 | 0920 0935 | | X | | Low T 70.6°F Cond. 203 PH 8.33 | 0165-NP-001-GN-SS-9009 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| [signature] | 9/27 1330 | [signature] | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| | | | | | |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |
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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| LT2000 | Freese AFB IRP | M. Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| Mac Smith | | M. Benner |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | B/N/A | Dest./PCB | Oil & Grease | Phenols | TDS | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 000 | 9/16/86 | 1400-1420 | | ✓ | | lew Cond: 15.73 T: 75.5°F pH 8.50 | 0165-GP-000-16-86-9200 | 8 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | See next line |
| | | | | | | | | 10 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: | |
|---|---|---|---|---|---|---|---|
| Mac Smith | 9/16/86 1524 | Hug Tegiln | | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: | Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | | |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | Mike Benner |

| Samplers: (Signatures) | Field Team Leader: |
|---|---|
| Mike Benner | Mike Benner |

| Site STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION Sample Number | NUMBER OF CONTAINERS | VOA's | Oil & Grease | Phenols | TDS | BNA | Org. Chlor. Pest. & PCB's | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 9/25 | 1450 1521 | | X | | Low ~~SEE REMARKS~~ ~~PH 6.5~~ | 0165-PG-001-GP-86-9011 | 2 | X | | | | | | | T 72.2°F Cond. 474 PH 8.4 |
| 001 | 9/25 | 1450 1521 | | X | | Low " " " | 0165-PG-001-GP-86-9011 | 1 | | X | | | | | | " " " |
| 001 | 9/25 | 1450 1521 | | X | | Low " " " | 0165-PG-001-GP-86-9011 | 1 | | | X | | | | | " " " |
| 001 | 9/25 | 1450 1521 | | X | | Low " " " | 0165-PG-001-GP-86-9011 | 1 | | | | X | | | | " " " |
| 001 | 9/25 | 1450 1521 | | X | | Low " " " | 0165-PG-001-GP-86-9011 | 1 | | | | | X | | | " " " |
| 001 | 9/25 | 1450 1521 | | X | | Low " " " | 0165-PG-001-GP-86-9011 | 1 | | | | | | X | | " " " |
| 001 | 9/25 | 1450 1521 | | X | | Low " " " | 0165-PG-001-GP-86-9011 | 1 | | | | | | | X | " " " |
| 002 | 9/25 | 1537 1621 | | X | | Low T 73.5°F Cond. 1234 PH 7.8 | 0165-PG-002-GP-86-9012 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 004 | 9/25 | 1330 1430 | | X | | Low T 73.7°F Cond. 2020 PH 6.8 | 0165-PG-004-GP-86-9014 | 8 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | |

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## CHAIN-OF-CUSTODY RECORD

Page Col 2

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| Site Station Number | Date | Time | Sample Type: COMP | GRAB | AIR | Sample Information: Expected Compounds (Concentration)* | Sample Number / Station Location | Number of Containers | Purgeable Halocarbons | Purgeable Aromatics | Phenols | BNA's | TDS | Primary Metals | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OC-1 | 9/26 | 1425 | | X | | Low Site OC-1 well T 24° cond 1300 pH 7 | 0165-16-OC4-GP-GG-3073 | 1 | | | X | | | | |
| OC-1 | 9/26 | 1520 | | X | | Low " " " | 0165-PG-OC4-GP-GG-3078 | 1 | | | | X | | | |
| OC-1 | 9/26 | 1530 | | X | | Low " " " | 0165-PG-OC4-GP-PG-3079 | 1 | | | | | X | | |
| OC-1 | 9/26 | 1525 | | X | | Low " " " | 0165-PG-OC4-GP-GG-3073 | 1 | | | | | | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| [signature] | 9/26/89, 1615 | [signature] | [signature] | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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AIR FORCE SPLITS

## CHAIN-OF-CUSTODY RECORD

Page 1 of 2

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M BENNER |
| Samplers: (Signature) | | Field Team Leader: |
| | | M BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE: COMP | GRAB | AIR | SAMPLE INFORMATION: EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLS | BNA | TDS | PRIMARY METALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 8/24/86 | 1245 1316 | | X | | Low Site 001 well - T 19° Cond 1300 pH 7 | 0165-PG-001-GP-86-9010 | 2 | X | | | | | | |
| 001 | 8/24/86 | 1245 1316 | | X | | Low " " " | 0165-PG-001-GP-86-5016 | 1 | | X | | | | | |
| 001 | 8/24/86 | 1245 1316 | | X | | Low " " " | 0165-PG-001-GP-86-5010 | 1 | | | X | | | | |
| 001 | 8/24/86 | 1245 1316 | | X | | Low " " " | 0165-PG-001-GP-86-5010 | 1 | | | | X | | | |
| 001 | 8/24/86 | 1245 1316 | | X | | Low " " " | 0165-PG-001-GP-86-5010 | 1 | | | | | X | | |
| 001 | 8/24/86 | 1245 1316 | | X | | Low " " " | 0165-PG-001-GP-86-9010 | 1 | | | | | | X | |
| 002 | 8/25/86 | 1120 1151 | | X | | Low Site 002 well T-18° Cond 1200 pH 7 | 0165-PG-002-GP-86-9031 | 2 | X | | | | | | |
| 002 | 8/25/86 | 1120 1151 | | X | | Low " " " | 0165-PG-002-GP-86-5031 | 1 | | X | | | | | |
| 002 | 8/25/86 | 1120 1151 | | X | | Low " " " | 0165-PG-002-GP-86-5031 | 1 | | | X | | | | |
| 002 | 8/25/86 | 1120 1151 | | X | | Low " " " | 0165-PG-002-GP-86-5031 | 1 | | | | X | | | |
| 002 | 8/25/86 | 1120 1151 | | X | | Low " " " | 0165-PG-002-GP-86-5031 | 1 | | | | | X | | |
| 002 | 8/25/86 | 1120 1151 | | X | | Low " " " | 0165-PG-002-GP-86-5031 | 1 | | | | | | X | |
| 004 | 8/26/86 | 1424 1524 | | X | | Low Site 004 well T-20° cond 1100 pH 7 | 0165-PG-004-GP-86-9073 | 2 | X | | | | | | |
| 004 | 8/26/86 | 1424 1524 | | X | | Low " " " | 0165-PG-004-GP-86-5072 | 1 | | X | | | | | |

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| [signature] | 8/27/86 1615 | [signature] | [signature] | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD



| Project No. | Project Name | Project Manager |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |

Samplers: (Signatures) Field Team Leader: M. BENNER

| Site Station Number | Date | Time | Sample Type: Comp | Grab | Air | Sample Information: Expected Compounds (Concentration)* | Sample Number / Station Location | Number of Containers | Purgeable Organics | Oil & Grease | Phenols | Base Neutral Acid | Primary Metals | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/15/86 | 1130-1132 | | X | | Low - Hurlwood well #4 T-17° Cond 1290 pH 7 | 0165-PG-008-GP-86-5114 | 2 | X | | | | | |
| 008 | 8/15/86 | 1130-1132 | | X | | Low " " " | 0165-PG-008-GP-86-5114 | 1 | | X | | | | |
| 008 | 8/15/86 | 1132-1138 | | X | | Low " " " | 0165-PG-008-GP-86-5114 | 1 | | | X | | | |
| 008 | 8/15/86 | 1130-1132 | | X | | Low " " " | 0165-PG-008-GP-86-5114 | 1 | | | | X | | |
| 008 | 8/15/86 | 1130-1132 | | X | | Low " " " | 0165-PG-008-GP-86-5114 | 1 | | | | | X | |
| 005 | 8/15/86 | 1224 | | X | | Low - Hurlwood well #5 T-18° Cond-1100 pH 7 | 0165-PG-005-GP-86-5115 | 2 | X | | | | | |
| 008 | 8/15/86 | 1214-1224 | | X | | Low " " " | 0165-PG-008-GP-86-5115 | 1 | | X | | | | |
| 008 | 8/15/86 | 1214-1224 | | X | | Low " " " | 0165-PG-008-GP-86-5115 | 1 | | | X | | | |
| 008 | 8/15/86 | 1214-1224 | | X | | Low " " " | 0165-PG-008-GP-86-5115 | 1 | | | | X | | |
| 008 | 8/15/86 | 1214-1224 | | X | | Low " " " | 0165-PG-008-GP-86-5115 | 1 | | | | | X | |

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| Relinquished By (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: |

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AIR FORCE SPLITS

## CHAIN-OF-CUSTODY RECORD



| Project No | Project Name | Project Manager: |
|---|---|---|
| DF-1000 | Reese AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER — STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Phenols | Base Neutral Acid | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/12/86 | 1545 1618 | | X | | Low Hullwood Well #3 | 0165-PG-008-GP-86-9113 | 1 | | | | | X | |
| 005 | " | 1232 1232 | | X | | Low Point Trench Hullwood Well Cond 350 T-23° pH-9 | 0165-PG-005-GP-86-9088 | 2 | X | | | | X | |
| 005 | " | " | | X | | Low " " " | 0165-PG-005-GP-86-9088 | 1 | | X | | | | |
| 005 | " | " | | X | | Low " " " | 0165-PG-005-GP-86-9088 | 1 | | | X | | | |
| 005 | " | " | | X | | Low " " " | 0165-PG-005-GP-86-9088 | 1 | | | | X | | |
| 005 | " | " | | X | | Low " " " | 0165-PG-005-GP-86-9088 | 1 | | | | | X | |
| 005 | " | 1232 1232 | | X | | Low Fence Well Cond 350 T-23° pH9 | 0165-PG-005-GP-86-9089 | 2 | X | | | | | |
| 005 | " | " | | X | | Low " " " | 0165-PG-005-GP-86-9089 | 1 | | X | | | | |
| 005 | " | " | | X | | Low " " " | 0165-PG-005-GP-86-9089 | 1 | | | X | | | Not Split MS |
| 005 | " | " | | X | | Low " " " | 0165-PG-005-GP-86-9089 | 1 | | | | X | | |
| 005 | " | " | | X | | Low " " " | 0165-PG-005-GP-86-9089 | 1 | | | | | X | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
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| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891-034-583 |
| Relinquished By: (Signature) | Date/Time | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: |

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AIR FORCE SPLITS

## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. BENNER |

| Site Station Number | Date | Time | Sample Type: Comp | Sample Type: Grab | Sample Type: Air | Sample Information: Expected Compounds (Concentration)* | Sample Number / Station Location | Number of Containers | Purgeable Organics | Oil & Grease | Phenols | Base Neutral Acid | Primary Metals | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/18/86 | 1420/1435 | | X | | Low Hubbard Well 1 Cond:2400 T:23° pH:7 | 0165-PG-008-GP-86-5111 | 2 | X | | | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5111 | 1 | | X | | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5111 | 1 | | | X | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5111 | 1 | | | | X | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5111 | 1 | | | | | X | |
| 008 | " | 1501/1519 | | X | | Low Hubbard Well 2 Cond-1350 T-23° pH 7 | 0165-PG-008-GP-86-5112 | 2 | X | | | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5112 | 1 | | X | | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5112 | 1 | | | X | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5112 | 1 | | | | X | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5112 | 1 | | | | | X | |
| 008 | " | 1545/1618 | | X | | Low Hubbard Well 3 Cond. -1220 T-21° pH-7 | 0165-PG-008-GP-86-5113 | 2 | X | | | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5113 | 1 | | X | | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5113 | 1 | | | X | | | |
| 008 | " | " | | X | | Low " " " | 0165-PG-008-GP-86-5113 | 1 | | | | X | | |

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| | 8/19/86 0900 | | | | FEDERAL EXPRESS | FEDERAL EXPRESS |
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## CHAIN-OF-CUSTODY RECORD

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| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | M. Benner |
| Samplers: (Signatures) | | Field Team Leader: M. Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | Sample Number STATION LOCATION | NUMBER OF CONTAINERS | Pesticides Oil & Grease Phenols Arsenic EP Toxicity Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 8/12/86 | 0926 0928 | | X | | Low - Site 008 Boring 1 1-4.0' | 0165-So-008-GS-86-9105 | 2 | X | |
| 008 | 8/12/86 | 0926 0928 | | X | | Low " " " | 0165-So-008-GS-86-9105 | 1 | X X X | |
| 008 | 8/12/86 | 0926 0928 | | X | | Low " " " | 0165-So-008-GS-86-9139 | 2 | X | |
| 008 | 8/12/86 | 0926 0928 | | X | | Low " " " | 0165-So-008-GS-86-9139 | 1 | X X X | |
| 008 | 8/12/86 | 0937 1101 | X | | | Low Site 008 Boring 1 Cuttings | 0165-So-008-GS-86-9182 | 2 | X X | |
| 008 | 8/12/86 | 1037 | | X | | Low " " 15-16.5' | 0165-So-008-GS-86-9106 | 2 | X | |
| 008 | 8/12/86 | 1037 | | X | | Low " " " | 0165-So-008-GS-86-9106 | 1 | X X X | |
| 008 | 8/12/86 | 1159 | | X | | Low " " 24-25.5' | 0165-So-008-GS-86-9107 | 2 | X | |
| 008 | 8/12/86 | 1159 | | X | | Low " " " | 0165-So-008-GS-86-9107 | 1 | X X X | |
| 008 | 8/12/86 | 1300 1727 | X | | | Low " Boring 2 Cuttings | 0165-So-008-GS-86-9181 | 2 | X X | |
| 008 | 8/13/86 | 1251 | | X | | Low " " 1-2.5' | 0165-So-008-GS-86-9108 | 2 | X | |
| 008 | 8/13/86 | 1251 | | X | | Low " " " | 0165-So-008-GS-86-9108 | 1 | X X X | |
| 008 | 8/13/86 | 1341 | | X | | Low " " 15-16.5' | 0165-So-008-GS-86-9109 | 2 | X | |
| 008 | 8/13/86 | 1341 | | X | | Low " " " | 0165-So-008-GS-86-9109 | 1 | X X X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| | 8/13/86 1711 | | | | | Federal Express |
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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DA2000 | Rome AFB IRP | M. Bonner |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. Bonner |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | Sample Number / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Phenols | Arsenic | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 008 | 9/6/84 | 1614 | | 1 | | Low Site 008 Boring 2 17.0-18.5' | 0165-S0-008-GS-86-9110 | 2 | X | | | | |
| 008 | 9/6/84 | 1614 | | 1 | | Low " " " | 0165-S0-008-GS-86-9110 | 1 | | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
|---|---|---|---|---|---|
| | 9/13/84 0714 | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) |

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Date:

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | M Benner |

Samplers: (Signatures)

Field Team Leader: M Benner

| Site STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | Sample Number STATION LOCATION | NUMBER OF CONTAINERS | Purgeable organics | Oil & Grease | Phenols | Chromium | Lead | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 006 | 9/11/86 | 1106 | | X | | Low St. 006 Boring 1 5-6.5' | 0165-SO-006-GS-86-9049 | 2 | X | | | | | | | |
| 006 | 9/11/86 | 1106 | | X | | Low " " " | 0165-SO-006-GS-86-9049 | 1 | | X | X | X | X | | | |
| 006 | 9/11/86 | 1224 1230 | | X | | Low " " 13-16.0' | 0165-SO-006-GS-86-9050 | 2 | X | | | | | | | |
| 006 | 9/11/86 | 1224 1230 | | X | | Low " " " | 0165-SO-006-GS-86-9050 | 1 | | X | X | X | X | | | |
| 006 | 9/11/86 | 1247 | | X | | Low " " 20-21.5' | 0165-SO-006-GS-86-9051 | 2 | X | | | | | | | |
| 006 | 9/11/86 | 1247 | | X | | Low " " " | 0165-SO-006-GS-86-9051 | 1 | | X | X | X | X | | | |
| 006 | 9/11/86 | 1317 | | X | | Low " " 25-26.5 | 0165-SO-006-GS-86-9052 | 2 | X | | | | | | | |
| 006 | 9/11/86 | 1317 | | X | | Low " " " | 0165-SO-006-GS-86-9052 | 1 | | X | X | X | X | | | |
| 006 | 9/11/86 | 1224 1230 | | X | | Low " " 13-16.0' | 0165-SO-006-GS-86-9144 | 2 | X | | | | | | | |
| 006 | 9/11/86 | 1224 1230 | | X | | Low " " " | 0165-SO-006-GS-86-9144 | 1 | | X | X | X | X | | | |
| 006 | 9/11/86 | 1225 1330 | X | | | Low " " Cuttings | 0165-SO-006-GS-86-9179 | 2 | | | | | | X | X | |
| 006 | 9/11/86 | 1225 1324 | X | | | Low " Boring 2 Cuttings | 0165-SO-006-GS-86-9180 | 2 | | | | | | X | X | |
| 006 | 9/11/86 | 1616 | | X | | Low " " 5-6.5' | 0165-SO-006-GS-86-9053 | 2 | X | | | | | | | |
| 006 | 9/11/86 | 1616 | | X | | Low " " " | 0165-SO-006-GS-86-9053 | 1 | | X | X | X | X | | | |

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| | 9/12/86 0758 | | | | | Federal Express |
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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | M. Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. Benner |

| Site STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | Sample Number STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Phenols | Chromium | Lead | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 006 | 8/11/86 | 1648 | | X | | Low Site 006 Boring 2 15-16.0' | 0165-SO-006-GS-86-9054 | 2 | X | | | | | |
| 006 | 8/11/86 | 1648 | | X | | Low " " " | 0165-SO-006-GS-86-9054 | 1 | | X | X | X | X | |
| 006 | 8/11/86 | 1711 | | X | | Low " " 20-21.5' | 0165-SO-006-GS-86-9055 | 2 | X | | | | | |
| 006 | 8/11/86 | 1711 | | X | | Low " " " | 0165-SO-006-GS-86-9055 | 1 | | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 8/11/86 0755 | [signature] | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
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NOTE: 9027, 9028 8/12/86 sewage lab bottom sed. samples 0-5", 5"-11" not on COC

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Purgeable Aromatic Hydrocarbons | Organochlor. Pest./PCB | Organohalides | Chlorinated Herb. | Primary Metals | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ~~007~~ | ~~8/5/86~~ | ~~1045~~ | ~~X~~ | | | ~~0165-SO-007-GS-86-9176 MS~~ | | | | | | | | | | | | MS |
| 007 | 8/5/86 | 1045 1205 | X | | | LOW - SITE 007 BORING 2 CUTTINGS | 0165-SO-007-GS-86-9176 | 2 | | | | | | | X | X | | |
| 007 | 8/5/86 | 0907 0935 | X | | | LOW - SITE 007 BORING 1 CUTTINGS | 0165-SO-007-GS-86-9175 | 2 | | | | | | | X | X | | |
| 007 | 8/5/86 | 1149 | | X | | LOW - SITE 007 BORING 2 30-31.5' | 0165-SO-007-GS-86-9161 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1149 | | X | | LOW - " " " | 0165-SO-007-GS-86-9101 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1326 | | X | | LOW SITE 007 BORING 3 15-16.5' | 0165-SO-007-GS-86-9100 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1356 | | X | | LOW - " " " | 0165-SO-007-GS-86-9100 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1203 | | X | | LOW - SITE 007 BORING 2 30-31.5' | 0165-SO-007-GS-86-9098 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 1203 | | X | | LOW - SITE 007 BORING 2 30-31.5' | 0165-SO-007-GS-86-9098 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 0932 | | X | | LOW SITE 007 BORING 1 17-18.5' | 0165-SO-007-GS-86-9095 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 0932 | | X | | LOW " " " | 0165-SO-007-GS-86-9095 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 0856 | | X | | LOW SITE 007 BORING 1 5-6.5' | 0165-SO-007-GS-86-9093 | 2 | X | | | | | | | | | |
| 007 | 8/5/86 | 0856 | | X | | LOW " " " | 0165-SO-007-GS-86-9093 | 1 | | X | X | | | | | | | |
| 007 | 8/5/86 | 1328 1418 | X | | | LOW SITE 007 BORING 3 CUTTINGS | 0165-SO-007-GS-86-9177 | 2 | | | | | | | X | X | | |

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| | 8/6/86 0742 | | | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: | Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Purgeable Aromatic Hydrocarbons | Organochlor. Pest./PCB | Organophos. Pest. | Chlorinated Herb. | Priority Metals | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 007 | 8/1/86 | 1331 | | X | | Low Site 007 Boring 3 5-6.5' | 0165-So-007-GS-86-9055 | 2 | X | | | | | | | | | ecology |
| 007 | 8/1/86 | 1331 | | X | | Low " " " | 0165-So-007-GS-86-9055 | 1 | | X | X | | | | | | | |
| 007 | 8/1/86 | 0920 | | X | | Low Site 007 - Boring 1 15-16.5' | 0165-So-007-GS-86-9020 | 2 | X | | | | | | | | | |
| 007 | 8/1/86 | 0920 | | X | | Low " " " | 0165-So-007-GS-86-9020 | 1 | | X | X | | | | | | | |
| 007 | 8/1/86 | 1111 | | X | | Low Site 007 Boring 2 15-16.5' | 0165-So-007-GS-86-9097 | 2 | X | | | | | | | | | |
| 007 | 8/1/86 | 1111 | | X | | Low " " " | 0165-So-007-GS-86-9097 | 1 | | X | X | | | | | | | |
| 007 | 8/1/86 | 1045 | | X | | Low Site 007 Boring 2 5-6.5' | 0165-So-007-GS-86-9096 | 2 | X | | | | | | | | | |
| 007 | 8/1/86 | 1045 | | X | | Low " " " | 0165-So-007-GS-86-9096 | 1 | | X | X | | | | | | | |
| 004 | 8/1/86 | 1520 | X | | | Low Site 004 Well Cuttings | 0165-So-004-GS-86-9174 | 2 | | | | | | | | X | X | |
| 007 | 8/1/86 | 1539 1630 | X | | | Low Site 007 Boring 4 Cuttings | 0165-So-007-GS-86-9179 | 2 | | | | | | | | X | X | |
| 007 | 8/1/86 | 1531 | | X | | Low Site 007 Boring 4 5-6.5' | 0165-So-007-GS-86-9102 | 2 | X | | | | | | | | | |
| 007 | 8/1/86 | 1531 | | X | | Low " " " | 0165-So-007-GS-86-9102 | 1 | | X | X | | | | | | | |
| 007 | 8/1/86 | 1546 | | X | | Low Site 007 Boring 4 15-16.5' | 0165-So-007-GS-86-9103 | 2 | X | | | | | | | | | |
| 007 | 8/1/86 | 1546 | | X | | Low " " " | 0165-So-007-GS-86-9103 | 1 | | X | X | | | | | | | |

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| [signature] | 8/6/86 0942 | [signature] | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD

Page 3 of 3

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | M. Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** M. Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Polynuc. Aromatic Hydrocarbons | Organochlor. Pest/PCB | Organophos. Pest | Chlorinated Herb. | Primary Metals | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 007 | 8/[illegible]/86 | 1625 1637 | | X | | Low Site 007 Boring 4 25-28.5 | 0165-SO-007-GS-86-9138 | 2 | X | | | | | | | | | |
| 007 | 8/[illegible]/86 | 1625 1637 | | X | | Low " " " | 0165-SO-007-GS-86-9138 | 1 | | X | X | | | | | | | |
| 007 | 8/[illegible]/86 | 1625 1637 | | X | | Low Site 007 Boring 4 25-28.5' | 0165-SO-007-GS-86-9104 | 2 | X | | | | | | | | | |
| 007 | 8/[illegible]/86 | 1625 1637 | | X | | Low " " " | 0165-SO-007-GS-86-9104 | 1 | | X | X | | | | | | | |
| 004 | 8/[illegible]/86 | 1103 | | X | | Low Site 004 Well 3' | 0165-SO-004-GS-86-9084 | 2 | X | | | | | | | | | |
| 004 | 8/[illegible]/86 | 1103 | | X | | Low " " " | 0165-SO-004-GS-86-9084 | 1 | | X | | X | X | X | X | | | |
| 004 | 8/[illegible]/86 | 1112 | | X | | Low Site 004 Well 15' | 0165-SO-004-GS-86-9085 | 2 | X | | | | | | | | | |
| 004 | 8/[illegible]/86 | 1112 | | X | | Low " " " | 0165-SO-004-GS-86-9085 | 1 | | X | | X | X | X | X | | | |
| 004 | 8/[illegible]/86 | 1133 | | X | | Low Site 004 Well 30' | 0165-SO-004-GS-86-9086 | 2 | X | | | | | | | | | |
| 004 | 8/[illegible]/86 | 1133 | | X | | Low " " " | 0165-SO-004-GS-86-9086 | 1 | | X | | X | X | X | X | | | |
| 007 | 8/[illegible]/86 | 1539 1614 | X | | | Low Site 007 Boring 4 Cuttings | 0165-SO-007-GS-86-9178 | 2 | | | | | | | | X | X | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|
| [signature] | 8/6 0742 | [signature] | | | | | |
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| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | M. Benner |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. Benner |

| Site Station Number | Date | Time | Sample Type: Comp | Sample Type: Grab | Sample Type: Air | Sample Information: Expected Compounds (Concentration)* | Sample Number Station Location | Number of Containers | Purgable Organics | Oil & Grease | BNA | Organochlor. Pest/PCB | Organophos. Pest | Chlorinated Herb | Phenols | TDS | Primary Metals | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 8/1/86 | 0854 0907 | | X | | Low - Site 001 Lake Bottom Sample | 0165-SD-001-GS-86-9007 | 2 | X | | | | | | | | | |
| 001 | 8/1/86 | 0854 0907 | | X | | Low " " | 0165-SD-001-GS-86-9007 | 1 | | X | X | X | X | X | | | | |
| 002 | 8/1/86 | 1204 1220 | | X | | Low - Lake Water (Sewage Lake) E side | 0165-NP-002-GN-86-9029 | 2 | X | | | | | | | | | |
| 002 | 8/1/86 | 1204 1220 | | X | | Low " | 0165-NP-002-GN-86-9029 | 1 | | X | | | | | • | | | |
| 002 | 8/1/86 | 1204 1220 | | X | | Low " | 0165-NP-002-GN-86-9029 | 1 | | | X | | | | | | | |
| 002 | 8/1/86 | 1204 1220 | | X | | Low " | 0165-NP-002-GN-86-9029 | 1 | | | | X | X | X | | | | |
| 002 | 8/1/86 | 1204 1220 | | X | | Low " | 0165-NP-002-GN-86-9029 | 1 | | | | | | | X | | | |
| 002 | 8/1/86 | 1204 1220 | | X | | Low " | 0165-NP-002-GN-86-9029 | 1 | | | | | | | | X | | |
| 002 | 8/1/86 | 1204 1220 | | X | | Low " | 0165-NP-002-GN-86-9029 | 1 | | | | | | | | | X | |
| 002 | 8/1/86 | 1307 1330 | | X | | Low Miller Lake Discharge | 0165-NP-002-GN-86-9030 | 2 | X | | | | | | | | | |
| 002 | 8/1/86 | 1307 1330 | | X | | Low " | 0165-NP-002-GN-86-9030 | 1 | | X | | | | | | | | |
| 002 | 8/1/86 | 1307 1330 | | X | | Low " | 0165-NP-002-GN-86-9030 | 1 | | | X | | | | | | | |
| 002 | 8/1/86 | 1307 1330 | | X | | Low " | 0165-NP-002-GN-86-9030 | 1 | | | | X | X | X | | | | |
| 002 | 8/1/86 | 1307 1330 | | X | | Low " | 0165-NP-002-GN-86-9030 | 1 | | | | | | | X | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: | |
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| | 8/1/86 1450 | | | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: | Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | | |

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AIR FORCE SPLIT

## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2060 | PSSJE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | BNA | Organochlor. Pest/PCB | Organophos. Pest. | Chlorinated Herb. | Phenols | TDS | Primary Metals | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 8/7/86 | Dec 1330 | | 1 | | Low - Mixed Lake Discharge. | CH.E-NP-002-GW-86-5030 | 1 | | | | | | | X | | | |
| 002 | 8/7/86 | Dec 1330 | | 1 | | Low " | 0165-NP-002-GW-86-5030 | 1 | | | | | | | | X | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: | |
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| | 8/8/86 1450 | | | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: | Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | | |

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AF Splits

## CHAIN-OF-CUSTODY RECORD



Project No.: DF-2060
Project Name: REESE AFB IRP
Project Manager: M. BENDER
Samplers: (Signatures)
Field Team Leader: M. BENDER

| SITE-STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER — STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Ext. & Cpd. Base/Acid Organics | Organophos. Pest./PCB | Chlorinated Herb. | Primary Metals | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 004 | 9/16 | 1004 1155 | X | | | Low - Site 004 Boring 3 Drummed Cuttings | 0165-So-004-GS-86-9167 | 2 | | | | | | X | X | |
| 004 | 9/16 | 1112 | X | X | | Low - " " 5-6.5' | 0165-So-004-GS-86-9081 | 2 | X | | | | | | | |
| 004 | 9/16 | 1112 | | X | | Low - " " " | 0165-So-004-GS-86-9081 | 1 | | X | X | X | X | X | | |
| 004 | 9/16 | 1036 | | X | | Low - " " 15-16.5' | 0165-So-004-GS-86-9082 | 2 | X | | | | | | | |
| 004 | 9/16 | 1036 | | X | | Low - " " " | 0165-So-004-GS-86-9082 | 1 | | X | X | X | X | X | | |
| 004 | 9/16 | 1141 | | X | | Low - " " 30-31.5' | 0165-So-004-GS-86-9083 | 2 | X | | | | | | | |
| 004 | 9/16 | 1141 | | X | | Low - " " " | 0165-So-004-GS-86-9083 | 1 | | X | X | X | X | X | | |
| 004 | 9/16 | 1141 | | X | | Low - " " 30-31.5' | 0165-So-004-GS-86-9142 | 2 | X | | | | | | | |
| 004 | 9/16 | 1141 | | X | | Low - " " " | 0165-So-004-GS-86-9142 | 1 | | X | X | X | X | X | | |
| 004 | 9/16 | 1300 | | X | | Low - " Boring 1 1-2.5' | 0165-So-004-GS-86-9075 | 2 | X | | | | | | | |
| 004 | 9/16 | 1300 | | X | | Low - " " " | 0165-So-004-GS-86-9075 | 1 | | X | X | X | X | X | | |
| 004 | 9/16 | 1318 1523 | X | | | Low - " " Drum Cuttings | 0165-So-004-GS-86-9168 | 2 | | | | | | X | X | |
| 004 | 9/16 | 1450 | | X | | Low - " " 3.5-7.5' | 0165-So-004-GS-86-9077 | 2 | X | | | | | | | |
| 004 | 9/16 | 1450 | | X | | Low - " " " | 0165-So-004-GS-86-9077 | 1 | | X | X | X | X | X | | |

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| | 9/16 0744 | | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | M. Benner |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Aromatics | Low Level Purgeable Aromatics | Halogenated Purgeable Aromatics | Halogenated Purgeable Aromatics Plus Freons | Priority Pollutant Metals | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 004 | 9/15/86 | 1336 | | X | | Low - Brink 1 Site 004 15-16.5' | 0165-So-004-GS-86-9076 | 2 | X | | | | | | | |
| 004 | 9/15/86 | 1338 | | X | | Low - " " " | 0165-So-004-GS-86-9076 | 1 | | X | X | X | X | X | | |
| 004 | 9/15/86 | 1428 | | X | | Low - Site 004 Boring 2 5-6.5' | 0165-So-004-GS-86-9077 | 2 | X | | | | | | | |
| 004 | 9/15/86 | 1421 | | X | | Low - " " " | 0165-So-004-GS-86-9077 | 1 | | X | X | X | X | X | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| **Samplers: (Signature)** | | **Field Team Leader:** |
| Dennis Palmquist | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | BNA | Chromium | Cadmium | Lead | Nickel | Zinc | Oil & Grease | Organic Chloride | Organic Phos. Pest. | Chlorinated Pest. | Phenols | Herbicides | EP Toxicity | Ignitability |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 005 | 8/2/86 | 0500 | | X | | Low Site 005 well 3' | GRS-SO-005-GS-86-9090 | 2 | X | | | | | | | | | | | | | | |
| 005 | 8/2/86 | 0500 | | X | | Low " " " | GRS-SO-005-GS-86-9090 | 1 | | X | X | X | X | X | X | | | | | | | | |
| 005 | 8/2/86 | 0708 | | X | | Low " " 15-17' | GRS-SO-005-GS-86-9091 | 2 | X | | | | | | | | | | | | | | |
| 005 | 8/2/86 | 0708 | | X | | Low " " " | GRS-SO-005-GS-86-9091 | 1 | | X | X | X | X | X | X | | | | | | | | |
| 005 | 8/2/86 | 0940 | | X | | Low " " 33-34.5' | GRS-SO-005-GS-86-9092 | 2 | X | | | | | | | | | | | | | | |
| 005 | 8/2/86 | 0940 | | X | | Low " " " | GRS-SO-005-GS-86-9092 | 1 | | X | X | X | X | X | X | | | | | | | | |
| 004 | 8/2/86 | 1623 | | X | | Low Site 4 Boring 2 19.5-21' | GRS-SO-004-GS-86-9080 | 2 | X | | | | | | | | | | | | | | |
| 004 | 8/2/86 | 1623 | | X | | Low " " " | GRS-SO-004-GS-86-9080 | 1 | | | | | | | X | X | X | X | X | | | | |
| 004 | 8/2/86 | 0954 | | X | | Low " " 15-16.5' | GRS-SO-004-GS-86-9079 | 2 | X | | | | | | | | | | | | | | |
| 004 | 8/2/86 | 0954 | | X | | Low " " " | GRS-SO-004-GS-86-9079 | 1 | | | | | | | X | X | X | X | X | | | | |
| 004 | 8/2/86 | 0934 1630 | X | | | Low Site 4 Boring 2 Drummed Cuttings | GRS-SO-004-GS-86-9170 9171 | 2 | | | | | | | | | | | | | X | X | |
| 005 | 8/2/86 | 1503 | X | | | Low Site 5 well Drummed cuttings | GRS-SO-005-GS-86-9169 | 2 | | | | | | | | | | | | | X | X | |
| | | | | | | | | | | | | | | | | | | | | | | | |
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| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | BL/Airbill Number: / Date: |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8/16 | 0751 | | X | | Low (Boring 1 5-6.5') | 0165-50-003-65-86-9057 | 2 | X |
| 8/16 | 0751 | | X | | Low (Boring 1 5-6.5') | 0165-50-003-65-86-9057 | 1 | |
| 8/16 | 0805 | | X | | Low (Boring 1 10-11.5') | 0165-50-003-65-86-9058 | 2 | X |
| 8/16 | 0805 | | X | | Low (Boring 1 10-11.5') | 0165-50-003-65-86-9058 | 1 | |
| 8/16 | 0816 | | X | | Low (Boring 1 15-16.5') | 0165-50-003-65-86-9059 | 2 | X |
| 8/16 | 0816 | | X | | Low (Boring 1 15-16.5') | 0165-50-003-65-86-9059 | 1 | |
| 8/16 | 0805 | | X | | Low (Boring 1 17-19.5') | 0165-50-003-65-86-9060 | 2 | X |
| 8/16 | 0805 | | X | | Low (Boring 1 17-19.5') | 0165-50-003-65-86-9060 | 1 | |
| 8/16 | 0803 0806 | X | | | Low (Boring 1 Drummond cuttings) | 0165-50-003-65-86-9168 | 2 | |
| 8/16 | 1619 | | X | | Low (Boring 2 5-6.5') | 0165-50-003-65-86-9061 | 2 | X |
| 8/16 | 1619 | | X | | Low (Boring 2 5-6.5') | 0165-50-003-65-86-9061 | 1 | |
| 8/16 | 1632 | | X | | Low (Boring 2 10-11.5') | 0165-50-003-65-86-9062 | 2 | X |
| 8/16 | 1632 | | X | | Low (Boring 2 10-11.5') | 0165-50-003-65-86-9062 | 1 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| X | | Low (Boring 2 15-16.5') | 0165-So-003-65-86-9063 | 1 | | X |
| X | | Low (Boring 2 20-21.5') | 0165-So-003-65-86-9064 | 2 | X | |
| X | | Low (Boring 2 20-21.5') | 0165-So-003-65-86-9064 | 1 | | X |
| X | | Low (Boring 2 27-28.5') | 0165-So-003-65-86-9143 | 2 | X | |
| X | | Low (Boring 2 27-28.5') | 0165-So-003-65-86-9143 | 1 | | X |
| X | | Low (Boring 3 5-6.5') | 0165-So-003-65-86-9065 | 2 | X | |
| X | | Low (Boring 3 5-6.5') | 0165-So-003-65-86-9065 | 1 | | X |
| X | | Low (Boring 3 10-11.5') | 0165-So-003-65-86-9066 | 2 | X | |
| X | | Low (Boring 3 10-11.5') | 0165-So-003-65-86-9066 | 1 | | X |
| X | | Low (Boring 3 of 15-16.5') | 0165-So-003-65-86-9067 | 2 | X | |
| X | | Low (Boring 3 15-16.5') | 0165-So-003-65-86-9067 | 1 | | X |
| X | | Low (Boring 3 of 17.5-19.0') | 0165-So-003-65-86-9068 | 2 | X | |
| X | | Low (Boring 3 17.5-19.0') | 0165-So-003-65-86-9068 | 1 | | X |
| X | | Low (Boring 4 5-6.5') | 0165-So-003-65-86-9069 | 2 | X | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Petroleum Hydrocarbons | Oil & Grease | Phenolics | Lead | SP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 003 | 8/16 | 1523 | | X | | Low (Boring 4 5-6.5') | 0165-SO-003-GS-86-9069 | 1 | | X | X | X | X | | | |
| 003 | 8/16 | 1536 | | X | | Low (Boring 4 10-11.5') | 0165-SO-003-GS-86-9072 | 2 | X | | | | | | | |
| 003 | 8/16 | 1536 | | X | | Low (Boring 4 10-11.5') | 0165-SO-003-GS-86-9070 | 1 | | X | X | X | X | | | |
| 003 | 8/16 | 1550 | | X | | Low (Boring 4 15-16.5') | 0165-SO-003-GS-86-9073 | 2 | X | | | | | | | |
| 003 | 8/16 | 1550 | | X | | Low (Boring 4 15-16.5') | 0165-SO-003-GS-86-9071 | 1 | | X | X | X | X | | | |
| 003 | 8/16 | 1631 1130 | X | | | Low (Boring 2 Drummed (CUTTINGS) | 0165-SO-003-GS-86-9174 | 2 | | | | | | X | X | |
| 003 | 8/16 | 1631 1130 | X | | | Low (Boring 2 Drummed (CUTTINGS) | 0165-SO-003-GS-86-9174 | 2 | | | | | | X | X | |
| 003 | 8/16 | 1141 | | X | | Low (Boring 2 27-28.5') | 0165-SO-003-GS-86-9150 | 2 | X | | | | | | | |
| 003 | 8/16 | 1141 | | X | | Low (Boring 2 27-28.5') | 0165-SO-003-GS-86-9152 | 1 | | X | X | X | X | | | |
| 003 | 8/16 | 1355 1339 | X | | | Low (Boring 3 Drummed CUTTINGS) | 0165-SO-003-GS-86-9172 | 2 | | | | | | X | X | |
| 003 | 8/16 | 1544 1616 | X | | | Low (Boring 4 Drummed CUTTINGS) | 0165-SO-003-GS-86-9173 | 2 | | | | | | X | X | |

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| | 8/16 0741 | Greg Zegulis | | | | Federal Express |
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| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Pease AFB IRP | M. Benner |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Phenols | EP Toxicity | Ignitability | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 8/1/86 | 1136 | X | | | Low SITE 002 WELL 01 CUTTINGS | 0165-S0-002-GS-86-9118 | 2 | | | | X | X | |
| 002 | 8/1/86 | 0918 | | X | | Low " " 15' | 0165-S0-002-GS-86-9043 | 2 | X | | | | | |
| 002 | 8/1/86 | 0918 | | X | | Low " " 15' | 0165-S0-002-GS-86-9043 | 1 | | X | X | | | |
| 002 | 8/1/86 | 0924 | | X | | Low " " 31' | 0165-S0-002-GS-86-9042 | 2 | X | | | | | |
| 002 | 8/1/86 | 0924 | | X | | Low " " 31' | 0165-S0-002-GS-86-9042 | 1 | | X | X | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| [signature] | 8/3/86 1223 | [signature] | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB IRP | M. BENNEC |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | M. BENNEC |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Pesticides | EP Toxicity / Ignitability | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 7/15/86 | 0857 | | X | | Low | 0165-SO-002-GS-86-9033 | 2 | X | | | | | | |
| 002 | 7/15/86 | 0857 | | X | | Low | 0165-SO-002-GS-86-9033 | 1 | | X | X | | | | |
| 002 | 7/15/86 | 0935 | | X | | Low | 0165-SO-002-GS-86-9034 | 2 | X | | | | | | |
| 002 | 7/15/86 | 0935 | | X | | Low | 0165-SO-002-GS-86-9034 | 1 | | X | X | | | | |
| 002 | 7/15/86 | 0956 | | X | | Low | 0165-SO-002-GS-86-9035 | 2 | X | | | | | | |
| 002 | 7/15/86 | 0956 | | X | | Low | 0165-SO-002-GS-86-9035 | 1 | | X | X | | | | |
| 002 | 7/15/86 | 0922 1006 | X | | | Low | 0165-SO-002-GS-86-9164 | 1 | | | | X | | | |
| 002 | 7/15/86 | 1138 | | X | | Low | 0165-SO-002-GS-86-9036 | 2 | X | | | | | | |
| 002 | 7/15/86 | 1138 | | X | | Low | 0165-SO-002-GS-86-9036 | 1 | | X | X | | | | |
| 002 | 7/15/86 | 1212 | | X | | Low | 0165-SO-002-GS-86-9037 | 2 | X | | | | | | |
| 002 | 7/15/86 | 1212 | | X | | Low | 0165-SO-002-GS-86-9037 | 1 | | X | X | | | | |
| 002 | 7/15/86 | 1229 | | X | | Low | 0165-SO-002-GS-86-9038 | 2 | X | | | | | | |
| 002 | 7/15/86 | 1229 | | X | | Low | 0165-SO-002-GS-86-9038 | 1 | | X | X | | | | |
| 002 | 7/15/86 | 1152 1251 | X | | | Low | 0165-SO-002-GS-86-9165 | 2 (1 MS) | | | | X | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| | 7/11/86 0745 | | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2600 | REESE AFB IRP | M. BENNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER — STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | Oil & Grease | Phenols | EP Toxicity / Ignitability | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 002 | 7/1/86 | 1427 | | X | | Low | 0165-SO-002-GS-86-9035 | 2 | X | | | | | | |
| 002 | 7/1/86 | 1427 | | X | | Low | 0165-SO-002-GS-86-9035 | 1 | | X | X | | | | |
| 002 | 7/1/86 | 1505 | | X | | Low | 0165-SO-002-GS-86-9040 | 2 | X | | | | | | |
| 002 | 7/1/86 | 1505 | | X | | Low | 0165-SO-002-GS-86-9040 | 1 | | X | X | | | | |
| 002 | 7/1/86 | MWD 1524 | X | | | Low | 0165-SO-002-GS-86-9046 | 1 | | | | X | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| | 7/1/86 0740 | | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | Reese AFB IRP | Michael E. Benner |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | Michael E. Benner |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | Sample Number STATION LOCATION | NUMBER OF CONTAINERS | Purgeable Organics | BNA | Organochlorine Pest/PCB | Organophosphorus Pest. | Chlorinated Herbicides | Oil & Grease | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 7/23/86 | 0845 | | X | | Low | 0165-SO-001-GS-86-5015 | 2 | X | | | | | | |
| 001 | 7/23/86 | 0845 | | X | | Low | 0165-SO-001-GS-86-5015 | 1 | | X | X | X | X | X | |
| 001 | 7/23/86 | 0926 | | X | | Low | 0165-SO-001-GS-86-5016 | 2 | X | | | | | | |
| 001 | 7/23/86 | 0926 | | X | | Low | 0165-SO-001-GS-86-5016 | 1 | | X | X | X | X | X | |
| 001 | 7/23/86 | 1011 | | X | | Low | 0165-SO-001-GS-86-5017 | 2 | X | | | | | | |
| 001 | 7/23/86 | 1011 | | X | | Low | 0165-SO-001-GS-86-5017 | 1 | | X | X | X | X | X | |
| 001 | 7/24/86 | 1256 | | X | | Low | 0165-SO-001-GS-86-5018 | 2 | X | | | | | | |
| 001 | 7/24/86 | 1256 | | X | | Low | 0165-SO-001-GS-86-5018 | 1 | | X | X | X | X | X | |
| 001 | 7/24/86 | 1341 | | X | | Low | 0165-SO-001-GS-86-5019 | 2 | X | | | | | | |
| 001 | 7/24/86 | 1341 | | X | | Low | 0165-SO-001-GS-86-5019 | 1 | | X | X | X | X | X | |
| 001 | 7/24/86 | 1416 | | X | | Low | 0165-SO-001-GS-86-5020 | 2 | X | | | | | | |
| 001 | 7/24/86 | 1416 | | X | | Low | 0165-SO-001-GS-86-5020 | 1 | | X | X | X | X | X | |
| 001 | 7/29/86 | 0922 | | X | | Low | 0165-SO-001-GS-86-5021 | 2 | X | | | | | | |
| 001 | 7/29/86 | 0922 | | X | | Low | 0165-SO-001-GS-86-5021 | 1 | | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 7/24/86 1715 | [signature] | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD

Page 2 of 2

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2060 | REESE AFB IRP | MICHAEL E. BENNER |
| **Samplers: (Signatures)** David L Palmquist Jr. Paul Bratzke | | **Field Team Leader:** MICHAEL E. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | BNA | ORGANOCHLORINE PEST/PCB | ORGANOPHOSPHOROUS PEST | CHLORINATED HERBICIDES | OIL & GREASE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 7/29/86 | 0744 | | X | | LOW | 0165-SD-001-GS-86-9022 | 2 | X | | | | | | SPLIT |
| 001 | 7/29/86 | 0744 | | X | | LOW | 0165-SD-001-GS-86-9022 | 1 | | X | X | X | X | X | |
| 001 | 7/29/86 | 1010 | | X | | LOW | 0165-SD-001-GS-86-9023 | 2 | X | | | | | | |
| 001 | 7/29/86 | 1010 | | X | | LOW | 0165-SD-001-GS-86-9023 | 1 | | X | X | X | X | X | |
| 001 | 7/29/86 | 1235 | | X | | LOW | 0165-SD-001-GS-86-9024 | 2 | X | | | | | | |
| 001 | 7/29/86 | 1235 | | X | | LOW | 0165-SD-001-GS-86-9024 | 1 | | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Paul Bratzke | 7/29/86/19:18 | | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | MIKE BENNER |
| Samplers: (Signatures) | | Field Team Leader: MIKE BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | | SAMPLE NUMBER -STATION LOCATION- | NUMBER OF CONTAINERS | VOA | OIL & GREASE | BNA | ARSENIC | CAUMIUM | LEAD | CHROME | COPPER | NICKEL | ZINC | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 009 | 7-24-96 | 1445 | X | | | VOLATILE ORGANICS (LOW) | 0-2' | 0165-50-009-GS-86-4130 | 2 4oz | X | | | | | | | | | | |
| | | 1445 | X | | | | 0-2' | 0165-50-009-GS-86-4130 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1500 | X | | | | 0-1' | 0165-50-009-GS-86-4131 | 2 4oz | X | | | | | | | | | | |
| | | 1500 | X | | | | 0-1' | 0165-50-009-GS-86-4131 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1500 | X | | | | 0-2' | 0165-50-009-GS-86-4132 | 2 4oz | X | | | | | | | | | | |
| | | 1500 | X | | | | 0-2' | 0165-50-009-GS-86-4132 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1520 | X | | | | 0-1' | 0165-50-009-GS-86-4133 | 2 4oz | X | | | | | | | | | | |
| | | 1520 | X | | | | 0-1' | 0165-50-009-GS-86-4134 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1520 | X | | | | 0-1' | 0165-50-009-GS-86-9134 | 2 4oz | X | | | | | | | | | | |
| | | 1520 | X | | | | 0-1' | 0165-50-009-GS-86-9134 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1520 | X | | | | 0-2' | 0165-50-009-GS-86-4135 | 2 4oz | X | | | | | | | | | | |
| | | 1520 | X | | | | 0-2' | 0165-50-009-GS-86-4135 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1535 | X | | | | 0-1' | 0165-50-009-GS-86-9136 | 2 4oz | X | | | | | | | | | | |
| | | 1535 | X | | | | 0-1' | 0165-50-009-GS-86-4136 | 1 8oz | | X | X | X | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: | |
|---|---|---|---|---|---|---|---|
| Paul Bratzke | 7-25-96/08:15 | Greg Zgulich | Greg Zgulich | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: | Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | MIKE BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | MIKE BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | | SAMPLE NUMBER —STATION LOCATION— | NUMBER OF CONTAINERS | VOA | OIL & GREASE | PNA | ARSENIC | CADMIUM | LEAD | CHROME | COPPER | NICKEL | ZINC | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 009 | 7-24-86 | 1311 | X | | | VOLATILE ORGANICS (LOW) | 0-1' | 0165-50-009-GS-86-4123 | 2 4oz | X | | | | | | | | | | |
| | | 1311 | X | | | | 0-1' | 0165-50-009-GS-86-4123 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1311 | X | | | | 0-2' | 0165-50-009-GS-86-4124 | 2 4oz | X | | | | | | | | | | |
| | | 1311 | X | | | | 0-2' | 0165-50-009-GS-86-4124 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1415 | X | | | | 0-1' | 0165-50-009-GS-86-4125 | 2 4oz | X | | | | | | | | | | |
| | | 1415 | X | | | | 0-1' | 0165-50-009-GS-86-4125 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1415 | X | | | | 0-2' | 0165-50-009-GS-86-4126 | 2 4oz | X | | | | | | | | | | |
| | | 1415 | X | | | | 0-2' | 0165-50-009-GS-86-4126 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1430 | X | | | | 0-1' | 0165-50-009-GS-86-4127 | 2 4oz | X | | | | | | | | | | |
| | | 1430 | X | | | | 0-1' | 0165-50-009-GS-86-4127 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1430 | X | | | | 0-2' | 0165-50-009-GS-86-4128 | 2 4oz | X | | | | | | | | | | |
| | | 1430 | X | | | | 0-2' | 0165-50-009-GS-86-4128 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1445 | X | | | | 0-1' | 0165-50-009-GS-86-4129 | 2 4oz | X | | | | | | | | | | |
| | | 1445 | X | | | | 0-1' | 0165-50-009-GS-86-4129 | 1 8oz | | X | X | X | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: | |
|---|---|---|---|---|---|---|---|
| Mark Brodzik | 7-25-86/08:15 | Greg Zigulis | Greg Zigulis | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number | Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | MIKE BENNER |
| Samplers: (Signatures) | | Field Team Leader: MIKE BENNER |

| SITE/STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER / ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | VOA | OIL & GREASE | BNA | ARSENIC | CADMIUM | LEAD | CHROME | COPPER | NICKEL | ZINC | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 009 | 7-24-86 | 1535 | X | | | VOLATILE ORGANICS (LOW) 0-2' | 0165-50-009-GS-86-4137 | 2 40z | X | | | | | | | | | | |
| | | 1535 | X | | | 0-2' | 0165-50-009-GS-86-4137 | 1 80z | | X | X | X | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| Paul Brazik | 7-25-86/08:15 | | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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## CHAIN-OF-CUSTODY RECORD



| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF2000 | REESE AFB IRP | MIKE RENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | MIKE RENNER |

| SITE ~~STATION~~ NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION / EXPECTED COMPOUNDS (Concentration)* | | SAMPLE NUMBER ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | VOA | OIL & GREASE | ENA | ARSENIC | CADMIUM | LEAD | CHROME | COPPER | NICKEL | ZINC | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 009 | 7-24-86 | 1205 | X | | | VOLATILE ORGANICS (LOW) | 0-1' | 0165-50-009-GS-86-9116 | 2 4oz | X | | | | | | | | | | |
| | | 1205 | X | | | | 0-1' | 0165-50-009-GS-86-9116 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1205 | X | | | | 0-2' | 0165-50-009-GS-86-9117 | 2 4oz | X | | | | | | | | | | |
| | | 1205 | X | | | | 0-2' | 0165-50-009-GS-86-9117 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1205 | X | | | | 0-2' | 0165-50-009-GS-86-9118 | 2 4oz | X | | | | | | | | | | |
| | | 1205 | X | | | | 0-2' | 0165-50-009-GS-86-9118 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1545 | X | | | | 0-1' | 0165-50-009-GS-86-9119 | 2 4oz | X | | | | | | | | | | |
| | | 1545 | X | | | | 0-1' | 0165-50-009-GS-86-9119 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1545 | X | | | | 0-2' | 0165-50-009-GS-86-9120 | 2 4oz | X | | | | | | | | | | |
| | | 1545 | X | | | | 0-2' | 0165-50-009-GS-86-9120 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1100 | X | | | | 0-1' | 0165-50-009-GS-86-9121 | 2-4oz | X | | | | | | | | | | |
| | | 1100 | X | | | | 0-1' | 0165-50-009-GS-86-9121 | 1 8oz | | X | X | X | X | X | X | X | X | X | |
| | | 1100 | X | | | | 0-2' | 0165-50-009-GS-86-9122 | 2 4oz | X | | | | | | | | | | |
| | | 1100 | X | | | | 0-2' | 0165-50-009-GS-86-9122 | 1 8oz | | X | X | X | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: | |
|---|---|---|---|---|---|---|---|
| Paul Brady | 7-25-86/08:15 | Greg Zigulis | Greg Zigulis | | | | |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: | Date: |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | | |

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## CHAIN-OF-CUSTODY RECORD

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| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF 2000 | REESE AFB IRP | M. BENNER |
| **Samplers: (Signature)** | | **Field Team Leader:** |
| | | M. BENNER |

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | STATION LOCATION SAMPLE NUMBER | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | BNA | ORGANOCHLORINE PEST/PCB | CHLORINATED PHENOLICS, PEST | CHLORINATED HERBICIDES EP TOX & TCLP METALS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 7/2/86 | 1322 | | X | | Low | 0165-So-001-GS-86-9012 | 2 | X | | | | | | |
| 001 | 7/2/86 | 1322 | | X | | Low | 0165-So-001-GS-86-9012 | 1 | | X | X | X | X | X | |
| 001 | 7/2/86 | 1331 | | X | | Low | 0165-So-001-GS-86-9013 | 2 | X | | | | | | |
| 001 | 7/2/86 | 1331 | | X | | Low | 0165-So-001-GS-86-9013 | 1 | | X | X | X | X | X | |
| 001 | 7/2/86 | 1441 1447 | | X | | Low | 0165-So-001-GS-86-9014 | 2 | X | | | | | | |
| 001 | 7/2/86 | 1441 1451 | | X | | Low | 0165-So-001-GS-86-9014 | 1 | | X | X | X | X | X | |
| 001 | 7/2/86 | 1441 1447 | | X | | Low | 0165-So-001-GS-86-9141 | 2 | X | | | | | | |
| 001 | 7/2/86 | 1441 1451 | | X | | Low | 0165-So-001-GS-86-9141 | 1 | | X | X | X | X | X | |
| 001 | 7/30/86 | 0920 | | X | | Low | 0165-So-001-GS-86-9160 | 1 | | | | | | | X |
| 001 | 7/2/86 | 1115 1118 | | X | | Low | 0165-So-001-GS-86-9161 | 1 | | | | | | | X |
| 001 | 7/2/86 | 1135 1157 | | GA | | Low | 0165-So-001-GS-86-9162 | 1 | | | | | | | X |
| 001 | 7/31/86 | 1316 1317 | | X | | Low | 0165-So-001-GS-86-9163 | 1 | | | | | | | X |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
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| [signature] | 7/30/86 1648 | [signature] | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: / Date: |
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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DE7000 | REESE AFB IRP | MICHAEL E. BEALNER |
| Samplers: (Signatures) | | Field Team Leader: |
| | | MICHAEL E. BEALNER |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | SAMPLE TYPE GRAB | SAMPLE TYPE AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | Pesticides (Pesticides Only) | Oil & Grease | PHENOLS | Base/Neutrals and/or Acid Extractables (Volatile Organic Compounds Only) | Volatile Organics (Volatile Organic Compounds Only) | Chlorinated Hydrocarbons (Pesticides/PCB Only) | Primary Metals | Total Dissolved Solids | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 6/2/88 | 1225 1305 | | X | | Low MD Medium | 0165-NP-001-GN-86-9005 | 2 | X | | | | | | | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low MD Medium | 0165-NP-001-GN-86-9005 | 1 | | X | | | | | | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low MD Medium | 0165-NP-001-GN-86-9005 | 1 | | | X | | | | | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low | 0165-NP-001-GN-86-9005 | 2 | | | | X | | | | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low | 0165-NP-001-GN-86-9005 | 2 | | | | | X | X | X | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low | 0165-NP-001-GN-86-9005 | 1 | | | | | | | X | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low MD Medium | 0165-NP-001-GN-86-9005 | 1 | | | | | | | | X | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low Medium | 0165-NP-001-GN-86-9006 | 2 | X | | | | | | | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low MD Medium | 0165-NP-001-GN-86-9006 | 1 | | X | | | | | | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low MD Medium | 0165-NP-001-GN-86-9006 | 1 | | | X | | | | | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low | 0165-NP-001-GN-86-9006 | 2 | | | | X | | | | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low | 0165-NP-001-GN-86-9006 | 2 | | | | | X | X | X | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low | 0165-NP-001-GN-86-9006 | 1 | | | | | | | X | | |
| 001 | 6/2/88 | 1225 1305 | | X | | Low MD Medium | 0165-NP-001-GN-86-9006 | 1 | | | | | | | | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 6/2/88 - 0755 | JOHN W. TIE | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 8910337625 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 6/2/88 |

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# CHAIN-OF-CUSTODY RECORD



Project No.: DF2000 | Project Name: REESE AFB IRP | Project Manager: MICHAEL E. BENNEE

Samplers: (Signatures) | Field Team Leader: MICHAEL E BENNEE

| SITE STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER STATION LOCATION | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLS | BASE/NEUTRALS/PCB'S ESTER | ORGANOCHLORINE PESTICIDES/PCB'S | ORGANO PHOSPHOROUS PESTICIDES | CHLORINATED HERBICIDES | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 001 | 6/6/86 | 1125 1200 | | X | | Low | 0165-SO-001-GS-86-9001 | 2 | X | | | | | | | |
| 001 | 6/6/86 | 1125 1200 | | X | | Low + Medium | 0165-SO-001-GS-86-9001 | 1 | | X | X | X | X | X | X | |
| 001 | 6/6/86 | 1125 1200 | | X | | Low + Medium | 0165-SO-001-GS-86-9002 | 2 | X | | | | | | | |
| 001 | 6/6/86 | 1125 1200 | | X | | Low | 0165-SO-001-GS-86-9002 | 1 | | X | X | X | X | X | X | |
| 001 | 6/6/86 | 1050 1125 | | X | | Low | 0165-SO-001-GS-86-9003 | 2 | X | | | | | | | |
| 001 | 6/6/86 | 1050 1125 | | X | | Low | 0165-SO-001-GS-86-9003 | 1 | | X | X | X | X | X | X | |
| 001 | 6/6/86 | 1442 1457 | | X | | Low | 0165-SO-001-GS-86-9004 | 2 | X | | | | | | | |
| 001 | 6/6/86 | 1442 1457 | | X | | Low | 0165-SO-001-GS-86-9004 | 1 | | X | X | X | X | X | X | |
| 002 | 6/6/86 | 1542 1550 | | X | | Low | 0165-SO-002-GS-86-9025 | 2 | X | | | | | | | |
| 002 | 6/6/86 | 1542 1550 | | X | | Low | 0165-SO-002-GS-86-9025 | 1 | | X | X | X | X | X | X | |
| 002 | 6/6/86 | 1553 1626 | | X | | Low | 0165-SO-002-GS-86-9026 | 2 | X | | | | | | | |
| 002 | 6/6/86 | 1553 1626 | | X | | Low | 0165-SO-002-GS-86-9026 | 1 | | X | X | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| | 6/7/86-0715 | | | | | FEDERAL EXPRESS |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 891033 76 5 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Date: 6/7/86 |

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## CHAIN-OF-CUSTODY RECORD

Page 1 of 1

| Project No.: | Project Name: | Project Manager: |
|---|---|---|
| DF-2000 | REESE AFB-IRP | MICHAEL E. BENNER |
| **Samplers: (Signatures)** | | **Field Team Leader:** |
| | | MICHAEL E. BENNER |

| STATION NUMBER | DATE | TIME | SAMPLE TYPE COMP | GRAB | AIR | SAMPLE INFORMATION — EXPECTED COMPOUNDS (Concentration)* | SAMPLE NUMBER ~~STATION LOCATION~~ | NUMBER OF CONTAINERS | PURGEABLE ORGANICS | OIL & GREASE | PHENOLS | CHROMIUM | LEAD | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 006 | 6/26/88 | 1154 1200 | | X | | Low | 0165-SO-006-GS-86-9048 | 2 | X | | | | | |
| 006 | 6/26/88 | 1154 1200 | | X | | Low | 0165-SO-006-GS-86-9048 | 1 | | X | X | X | X | |
| 006 | 6/26/88 | 1154 1200 | | X | | Low | 0165-SO-006-GS-86-9047 | 2 | X | | | | | |
| 006 | 6/26/88 | 1154 1200 | | X | | Low | 0165-SO-006-GS-86-9047 | 1 | | X | X | X | X | |

| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Ship Via: |
|---|---|---|---|---|---|---|
| [signature] | 6/27/88 0755 | John W. Tice | | | | Federal Express |
| Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received By: (Signature) | BL/Airbill Number: 8910337 6, Date: 6/27/88 |
| Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | Relinquished By: (Signature) | Date/Time: | Received For Laboratory By: (Signature) | |

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# APPENDIX H

# ANALYTICAL DATA

Table H-1

SAMPLE IDENTIFICATION CROSS REFERENCE

| Lab Number | Field Number | Description | Page |
|---|---|---|---|
| 001-INDUSTRIAL WASTE LAKE | | | |
| 4974A | GS-86-9001 | Sediment, Lake Inlet Delta | H-10 |
| 4975 | GS-86-9002 | Sediment, Lake Inlet Delta, Duplicate | H-10 |
| 4976 | GS-86-9003 | Sediment, Spur 309 Drainage Ditch | H-10 |
| 4977 | GS-86-9004 | Sediment, Roadside Ditch | H-10 |
| 4982 | GN-86-9005 | Surface Water, Pump Inlet | H-10 |
| 4983 | GN-86-9006 | Surface Water, Pump Inlet | H-10 |
| 5911* | GN-86-9005 | Surface Water South Pump Inlet | H-11 |
| 5940 | GS-86-9012 | Boring 001-B1, 5'-6.5' | H-56 |
| 5941 | GS-86-9013 | Boring 001-B1, 15'-16.5' | H-56 |
| 5942 | GS-86-9014 | Boring 001-B1, 28.5'-30' | H-56 |
| 5943 | GS-86-9141 | Boring 001-B1, 28.5'-30 Duplicate | H-56 |
| 5944 | GS-86-9160 | Drill Cuttings | H-56 |
| 5945 | GS-86-9161 | Drill Cuttings | H-56 |
| 5946 | GS-86-9162 | Drill Cuttings | H-56 |
| 5947 | GS-96-9163 | Drill Cuttings | H-56 |
| 5901 | GS-86-9015 | Boring 001-B2, 1'-2.5' | H-73 |
| 5902 | GS-86-9016 | Boring 001-B2, 15'-16.5' | H-73 |
| 5903 | GS-86-9017 | Boring 001-B2, 21.5'-23' | H-73 |
| 5904 | GS-86-9018 | Boring 001-B3, 5'-6.5' | H-73 |
| 5905 | GN-86-9019 | Boring 001-B3, 15'-16.5' | H-73 |
| 5906 | GS-86-9020 | Boring 001-B3, 22'-23.5' | H-73 |
| 5907 | GS-86-9021 | Well 001-W1, 0-3' | H-73 |
| 5908 | GS-86-9022 | Well 001-W1, 15' | H-73 |
| 5909 | GS-86-9023 | Well 001-W1, 30' | H-73 |
| 5910 | GS-86-9024 | Well 001-W1, 50' | H-73 |
| 6428 | GP-86-9007 | Sediment, South Lake Bottom | H-103 |
| 7348 | GP-86-9010 | Groundwater, Well 001-W1 | H-392 |
| 8329 | GP-86-9011 | Groundwater, Well 001-W1 | H-411 |
| 8364 | GN-86-9008 | Surface Water, South Pump Inlet | H-428 |
| 8365 | GN-86-9009 | Surface Water, South Pump Inlet Duplicate | H-428 |
| 002-SEWAGE LAKE | | | |
| 6004 | GS-86-9033 | Boring 002-B1, 5'-6.5' | H-117 |
| 6005 | GS-86-9034 | Boring 002-B1, 15'-16.5' | H-117 |
| 6006 | GS-86-9035 | Boring 002-B1, 20'-21.0' | H-117 |
| 6007 | GS-86-9036 | Boring 002-B2, 1'-2.5' | H-117 |
| 6008 | GS-86-9037 | Boring 002-B2, 15'-16.5' | H-117 |
| 6009 | GS-86-9038 | Boring 002-B2, 19'-20.5' | H-117 |
| 6010 | GS-86-9039 | Boring 002-B3, 1'-2.5' | H-117 |
| 6011 | GS-86-9040 | Boring 002-B3, 15'-16.5' | H-117 |

*Resample for phenols

Table H-1 (Cont.)

| Lab Number | Field Number | Description | Page |
|---|---|---|---|
| 002-SEWAGE LAKE (Cont.) | | | |
| 6012 | GS-86-9164 | Drill Cuttings | H-117 |
| 6013 | GS-86-9165 | Drill Cuttings | H-117 |
| 6014 | GS-86-9166 | Drill Cuttings | H-117 |
| 4978 | GS-86-9025 | Sediment, Sewage Plant Discharge | H-10 |
| 4979 | GS-86-9026 | Sediment, Low Flow Area | H-10 |
| 6426 | GS-86-9029 | Surface Water, Pump Inlet, N.E. Corner of Lake | H-134 |
| 6427 | GS-86-9030 | Surface Water, Polishing Lake Discharge | H-134 |
| 6827 | GS-86-9027 | Sediment, Eastern Lake Bottom (0-1') | H-266 |
| 6828 | GS-86-9028 | Sediment, Eastern Lake Bottom (1'-2') | H-266 |
| 7022 | GS-86-9042 | Well 002-W2, 3' | H-153 |
| 7023 | GS-86-9043 | Well 002-W2, 15' | H-153 |
| 7024 | GS-86-9183 | Drill Cuttings | H-153 |
| 7349 | GP 86-9031 | Groundwater, Well 002-W1 | H-392 |
| 8330 | GP-86-9032 | Groundwater, Well 002-W1 | H-411 |
| 8366 | GP-86-9044 | Surface Water, Polishing Lake Discharge | H-428 |
| 8367 | GN-86-9045 | Surface Water, N.E. Pump Inlet | H-428 |
| 003-POL STORAGE AREA (AQUA SYSTEM) SPILL SITE | | | |
| 6159 | GS-86-9061 | Boring 003-B2, 5'-6.5' | H-167 |
| 6160 | GS-86-9062 | Boring 003-B2, 10'-11.5' | H-167 |
| 6161 | GS-86-9063 | Boring 003-B2, 15'-16.5' | H-167 |
| 6162 | GS-86-9064 | Boring 003-B2, 20'-21.5' | H-167 |
| 6163 | GS-86-9065 | Boring 003-B3, 5'-6.5' | H-167 |
| 6164 | GS-86-9066 | Boring 003-B3, 10'-11.5' | H-167 |
| 6165 | GS-86-9067 | Boring 003-B3, 15'-16.5' | H-167 |
| 6166 | GS-86-9068 | Boring 003-B3, 17.5'-19' | H-167 |
| 6167 | GS-86-9069 | Boring 003-B4, 5'-6.5' | H-167 |
| 6168 | GS-86-9070 | Boring 003-B4, 10'-11.5' | H-167 |
| 6169 | GS-86-9071 | Boring 003-B4, 15'-16.5' | H-167 |
| 6170 | GS-86-9143 | Boring 003-B2, 27'-28.5' | H-168 |
| 6171 | GS-86-9150 | Boring 003-B2, 27'-28.5' Duplicate | H-168 |
| 6172 | GS-86-9168 | Drill Cuttings | H-168 |
| 6173 | GS-96-9171 | Drill Cuttings | H-168 |
| 6174 | GS-86-9172 | Drill Cuttings | H-168 |
| 6175 | GS-86-9174 | Drill Cuttings | H-187 |
| 6227 | GS-86-9057 | Boring 003-B1, 5'-6.5' | H-187 |
| 6228 | GS-86-9058 | Boring 003-B1, 10'-11.5' | H-187 |
| 6229 | GS-86-9059 | Boring 003-B1, 15'-16.5' | H-187 |
| 6230 | GS-86-9060 | Boring 003-B1, 17'-19.5' | H-187 |
| 6247 | GS-86-9173 | Drill Cuttings | H-188 |
| 004-SOUTHWEST LANDFILL | | | |
| 6043 | GS-86-9075 | Boring 004-B1, 1'-2.5' | H-225 |
| 6044 | GS-86-9076 | Boring 004-B1, 15'-16.5' | H-225 |
| 6045 | GS-86-9077 | Boring 004-B1, 30'-31.5' | H-225 |
| 6046 | GS-86-9078 | Boring 004-B2, 5'-6.5' | H-225 |

Table H-1 (Cont.)

| Lab Number | Field Number | Description | Page |
|---|---|---|---|
| 004-SOUTHWEST LANDFILL (Cont.) | | | |
| 6047 | GS-86-9081 | Boring 004-B3, 5'-6.5' | H-225 |
| 6048 | GS-86-9082 | Boring 004-B3, 15'-16.5' | H-225 |
| 6049 | GS-86-9083 | Boring 004-B3, 30'-31.5' | H-225 |
| 6050 | GS-86-9142 | Boring 004-B3, 30.5'-31.5' Duplicate | H-225 |
| 6051 | GS-86-9168 | Drill Cuttings | H-225 |
| 6052 | GS-86-9167 | Drill Cuttings | H-225 |
| 6231 | GS-86-9084 | Well 004-W1, 3' | H-187 |
| 6232 | GS-86-9085 | Well 004-W1, 15' | H-187 |
| 6233 | GS-86-9086 | Well 004-W1, 30' | H-187 |
| 6248 | GS-86-9174 | Drill Cuttings | H-188 |
| 6053 | GS-86-9079 | Boring 004-B2, 15'-16.5' | H-245 |
| 6054 | GS-86-9080 | Boring 004-B2, 19.5'-21' | H-245 |
| 6059 | GS-86-9170 | Drill Cuttings | H-245 |
| 7350 | GS-86-9073 | Groundwater, Well 004-W1 | H-392 |
| 8331 | GS-86-9074 | Groundwater, Well 004-W1 | H-411 |
| 005-CIVIL ENGINEERING PAINT SHOP TRENCH | | | |
| 6055 | GS-86-9090 | Well 005-W1, 3' | H-245 |
| 6056 | GS-86-9091 | Well 005-W1, 15' | H-245 |
| 6057 | GS-86-9092 | Well 005-W1, 30' | H-245 |
| 6058 | GS-86-9169 | Drill Cuttings | H-245 |
| 7297 | GN-86-9088 | Groundwater, Well 005-W1 | H-307 |
| 7298 | GN-86-9089 | Groundwater, Well 005-W1 Duplicate | H-307 |
| 7325* | GN-86-9089 | Groundwater, Well 005-W1 | H-307 |
| 8369 | GN-86-9140 | Groundwater, Well 005-W1 | H-428 |
| 8385 | GN-86-9140 | Groundwater, Well 005-W1 Duplicate | H-428 |
| 006-ACTIVE FIRE TRAINING AREA | | | |
| 4980 | GS-86-9047 | Sediment, 0-6" sump outlet | H-10 |
| 4981 | GS-86-9048 | Sediment, 0-6" natural depression | H-10 |
| 6829 | GS-86-9049 | Boring 006-B1, 5'-6.5' | H-266 |
| 6830 | GS-86-9050 | Boring 006-B1, 13'-16' | H-266 |
| 6831 | GS-86-9051 | Boring 006-B1, 20'-21.5' | H-266 |
| 6832 | GS-86-9052 | Boring 006-B1, 25'-26.5' | H-266 |
| 6833 | GS-86-9053 | Boring 006-B2, 5'-6.5' | H-266 |
| 6834 | GS-86-9054 | Boring 006-B2, 15'-16.5' | H-266 |
| 6835 | GS-86-9055 | Boring 006-B2, 20'-21.5' | H-266 |
| 6836 | GS-86-9144 | Boring 006-B1,13'-16' Duplicate | H-266 |
| 6837 | GS-86-9179 | Drill Cuttings | H-266 |
| 6838 | GS-86-9180 | Drill Cuttings | H-266 |

*Resample for phenols

Table H-1 (Cont.)

| Lab Number | Field Number | Description | Page |
|---|---|---|---|
| **007-NORTHWEST LANDFILL/RUBBLE AREA** | | | |
| 6234 | GS-86-9093 | Boring 007-B1, 5'-6.5' | H-187 |
| 6235 | GS-86-9094 | Boring 007-B1, 15'-16.5' | H-187 |
| 6236 | GS-86-9095 | Boring 007-B1, 17'-18.5' | H-187 |
| 6237 | GS-86-9096 | Boring 007-B2, 5'-6.5' | H-187 |
| 6238 | GS-86-9097 | Boring 007-B2, 15'-16.5' | H-187 |
| 6239 | GS-86-9098 | Boring 007-B2, 30'-31.5' | H-188 |
| 6240 | GS-86-9099 | Boring 007-B3, 5'-6.5' | H-188 |
| 6241 | GS-86-9100 | Boring 007-B3, 15'-16.5' | H-188 |
| 6242 | GS-86-9101 | Boring 007-B3, 30'-31.5' | H-188 |
| 6243 | GS-86-9102 | Boring 007-B4, 5'-6.5' | H-188 |
| 6244 | GS-86-9103 | Boring 007-B4, 15'-16.5' | H-188 |
| 6245 | GS-86-9104 | Boring 007-B4, 25'-28.5' | H-188 |
| 6246 | GS-86-9138 | Boring 007-B4, 25'-28.5' Duplicate | H-188 |
| 6249 | GS-86-9175 | Drill Cuttings | H-188 |
| 6250 | GS-86-9176 | Drill Cuttings | H-188 |
| 6251 | GS-86-9177 | Drill Cuttings | H-189 |
| 6252 | GS-86-9178 | Drill Cuttings | H-189 |
| 6253 | GS-86-9179 | Drill Cuttings | H-189 |
| **008-HURLWOOD AQUISITION AND LANDFILL** | | | |
| 6871 | GS-86-9105 | Boring 008-B1, 1'-2.5' | H-289 |
| 6872 | GS-86-9106 | Boring 008-B1, 15'-16.5' | H-289 |
| 6873 | GS-86-9107 | Boring 008-B1, 24'-25.5' | H-289 |
| 6874 | GS-86-9108 | Boring 008-B2, 1'-2.5' | H-289 |
| 6875 | GS-86-9109 | Boring 008-B2, 15'-16.5' | H-289 |
| 6876 | GS-86-9110 | Boring 008-B2, 17'-18.5' | H-289 |
| 6877 | GS-86-9139 | Boring 008-B1, 1'-2.5' Duplicate | H-289 |
| 6878 | GS-86-9181 | Drill Cuttings | H-289 |
| 6879 | GS-86-9182 | Drill Cuttings | H-289 |
| 7294 | GN-86-9111 | Groundwater, Well 008-W1 | H-307 |
| 7295 | GN-86-9112 | Groundwater, Well 008-W2 | H-307 |
| 7296 | GN-86-9113 | Groundwater, Well 008-W3 | H-307 |
| 7326 | GP-86-9114 | Groundwater, Well 008-W4 | H-329 |
| 7327 | GP-86-9115 | Groundwater, Well 008-W5 | H-329 |
| **009-SEWAGE DIGESTER SLUDGE SPREADING AREA** | | | |
| 5760 | GS-86-9116 | Boring 009-B1, 0-1' | H-346 |
| 5761 | GS-86-9117 | Boring 009-B1, 1'-2' | H-346 |
| 5762 | GS-86-9118 | Boring 009-B1, 1'-2' Duplicate | H-346 |
| 5763 | GS-86-9119 | Boring 009-B2, 0-1' | H-346 |
| 5764 | GS-86-9120 | Boring 009-B2, 1'-2' | H-346 |
| 5765 | GS-86-9121 | Boring 009-B3, 0-1' | H-346 |
| 5766 | GS-86-9122 | Boring 009-B3, 1'-2' | H-346 |
| 5767 | GS-86-9123 | Boring 009-B4, 0-1' | H-346 |

Table H-1 (Cont.)

| Lab Number | Field Number | Description | Page |
|---|---|---|---|
| 009-SEWAGE DIGESTER SLUDGE SPREADING AREA (Cont.) | | | |
| 5768 | GS-86-9124 | Boring 009-B4, 1'-2' | H-346 |
| 5769 | GS-86-9125 | Boring 009-B5, 0-1' | H-346 |
| 5770 | GS-86-9126 | Boring 009-B5, 1'-2' | H-346 |
| 5771 | GS-86-9127 | Boring 009-B6, 0-1' | H-346 |
| 5772 | GS-86-9128 | Boring 009-B6, 1'-2' | H-347 |
| 5773 | GS-86-9129 | Boring 009-B7, 0-1' | H-347 |
| 5774 | GS-96-9130 | Boring 009-B7, 1'-2' | H-347 |
| 5775 | GS-86-9131 | Boring 009-B8, 0-1' | H-347 |
| 5776 | GS-86-9132 | Boring 009-B8, 1'-2' | H-347 |
| 5777 | GS-86-9133 | Boring 009-B9, 0-1' | H-347 |
| 5778 | GS-86-9134 | Boring 009-B9, 0-1' Duplicate | H-347 |
| 5779 | GS-86-9135 | Boring 009-B9, 1'-2' | H-347 |
| 5780 | GS-86-9136 | Boring 009-B10, 0-1' | H-347 |
| 5781 | GS-86-9137 | Boring 009-B10, 1'-2' | H-347 |

Table H-2

REESE AFB PHASE II STAGE 1
ANALYTICAL METHODS, DETECTION LIMITS, AND HOLDING TIMES

| Parameter | Method | Detection Limit | Holding Time |
|---|---|---|---|
| Purgeable Organic Compounds | SW8010 & SW8020<br>E601 & E602 | 1 mg/kg<br>a | 14 days |
| Pesticides/PCBs and Herbicides | SW3550, then SW8080 | | Extracted within 7 days; analyzed within following 30 days. |
| | SW8150<br>E608, SW8140 and A509B | 1 mg/kg<br>a | Extracted within 7 days; analyzed within following 40 days. |
| Base/Neutral/ Acids Extractable | SW3550, then SW8270<br>E625 | 1 mg/kg<br>a | Extracted within 14 days, analyzed within following 40 days. |
| Oil & Grease | E413.2 (modified for soils) | 100 ug/g | 28 days |
| (using IR) | E413.2 | 200 ug/L | |
| Petroleum Hydrocarbons | E418.1 (modified for soils) | 10 mg/kg | 28 days |
| Polynuclear Aromatic Hydrocarbons | SW3550, then SW8110 | a | Extracted within 7 days, analyzed within following 30 days |
| Phenols | SE3550, then SW8049<br>E604 | a<br>a | Extracted within 7 days, analyzed within following 30 days. |
| Total Dissolved Solids (TDS) | E160.1 | 1 mg/l | 7 days |
| Metals, Primary | SW3050, then SW6010<br>E200.7 | a<br>a | No recommended holding time |
| Arsenic | SW3050, then SW7060 | 0.1 mg/kg | No recommended holding time |
| Cadmium | SW3050, then SW7130 | 0.5 mg/kg | No recommended holding time |
| Chromium | SW3050, then SW7190 | 5 mg/kg | No recommended holding time |
| Copper | SW3050, then SW7210 | 2 mg/kg | No recommended holding time |
| Lead | SW3050, then SW7420 | 10 mg/kg | No recommended holding time |
| Nickel | SW3050, then SW7520 | 0.4 mg/kg | No recommended holding time |

Table H-2 (Cont.)

| Parameter | Method | Detection Limit | Holding Time |
|---|---|---|---|
| Zinc | SW3050, then SW7950 | 0.05 mg/kg | No recommended holding time |
| pH | E150.1 | -- | No recommended holding time |
| EP Toxicity (Metals) | SW Manual | b | No recommended holidng time |
| Ignitability | SW1010 | c | No recommended holding time |

a) Detection limits as specified by the applicable EPA or Standard Method.

b)

| Metal | ug/L leaching solution |
|---|---|
| As | 0.002 |
| Ba | 0.1 |
| Cd | 0.005 |
| Cr | 0.05 |
| Hexavalent Cr | 0.05 |
| Pb | 0.1 |
| Hg | 0.0002 |
| Se | 0.002 |
| Ag | 0.01 |

c) Test for ignitability. If positive, it is a hazardous waste, in accordance with 40 CFR 261.21.

## CORRECTING WET WEIGHT TO DRY WEIGHT

To correct the wet weight sample result to dry weight, the result must be divided by the percent solids (expressed in decimal form).

FOR EXAMPLE:

A sample is 65% solids.

$$\frac{\text{15 mg/kg as received}}{\text{0.65 (Solids)}} = \text{23 mg/kg dry weight}$$

KS/lo

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3615

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 4974A | 9001 | 0165-SO-001-GS-86-9001 |
| 4975 | 9002 | 0165-SO-001-GS-86-9002 |
| 4976 | 9003 | 0165-SO-001-GS-86-9003 |
| 4977 | 9004 | 0165-SO-001-GS-86-9004 |
| 4978 | 9025 | 0165-SO-002-GS-86-9025 |
| 4979 | 9026 | 0165-SO-002-GS-86-9026 |
| 4980 | 9047 | 0165-SO-006-GS-86-9047 |
| 4981 | 9048 | 0165-SO-006-GS-86-9048 |
| 4982 | 9005 | 0165-NP-001-GN-86-9005 |
| 4983 | 9006 | 0165-NP-001-GN-86-9006 |
| | | |
| | | |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3801.3

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 5911 | 9005 | 0165-WP-001-GN-86-9005 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3615.1

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Ext | Dead | Anal | Dead | Ext | Dead | Anal |
| 3615 | 4982 | 6/26 | 7/10 | 6/30, 7/2 | 7/3 | 7/1 | 7/31 | 7/3 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | 4983 | 6/26 | 7/10 | 6/30, 7/2 | 7/3 | 7/1 | 7/31 | 7/3 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | 7/3 | 7/1 | 7/31 | 7/24 |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | VOA Confirmation Date | | | | Pest/PCB Confirmation Date | | | | | | | | | | | | | | | |
| | 4982 | | 7/7 | | 4979 | | 7/11 | | | | | | | | | | | | | |
| | 4983 | | 7/7 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

H-12

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3615.2

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3615 | 4982 | 6/26 | -- | -- | -- | -- | 7/3 | 7/1 | 8/10 | 7/2 | 7/3 | 7/1 | 7/24 | 7/15 | -- | -- |
| | 4983 | 6/26 | -- | -- | -- | -- | 7/3 | 7/1 | 8/10 | 7/2 | 7/3 | 7/1 | 7/24 | 7/15 | -- | -- |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3615.3

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal |
| 3615 | 4974A | 6/26 | 7/10 | 6/3; 7/7,9 | 7/3 | 7/1 | 7/31 | 7/7 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | 4975 | 6/26 | 7/10 | 6/3; 7/7,9 | 7/3 | 7/1 | 7/31 | 7/7 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | 4976 | 6/26 | 7/10 | 6/3; 7/7,9 | 7/3 | 7/1 | 7/31 | 7/7 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | 4977 | 6/26 | 7/10 | 6/3; 7/7,9 | 7/3 | 7/1 | 7/31 | 7/7 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | 4978 | 6/26 | 7/10 | 6/3; 7/7,9 | 7/3 | 7/1 | 7/31 | 7/7 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | 4979 | 6/26 | 7/10 | 6/3; 7/7,9 | 7/3 | 7/1 | 7/31 | 7/7 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | 4980 | 6/26 | 7/10 | 6/3; 7/7,9 | 7/3 | 7/1 | 7/31 | 7/7 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | 4981 | 6/26 | 7/10 | 6/3; 7/7,9 | 7/3 | 7/1 | 7/31 | 7/7 | 7/3 | 7/1 | 8/10 | 7/9 | 7/3 | 7/1 | 7/10 | 7/3 | -- | -- | -- | -- |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | VOA Confirmation Date | | | | | | | | | | | | | | | | | | |
| | 4974A | | 7/8 | | | | | | | | | | | | | | | | | |
| | 4975 | | 7/8 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

H-14

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3615.4

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(14/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3615 | 4974A | 6/26 | -- | -- | -- | -- | 7/10 | 7/1 | 8/10 | 7/11 | -- | -- | 7/24 | 7/23 | -- | -- |
| | 4975 | 6/26 | -- | -- | -- | -- | 7/10 | 7/1 | 8/10 | 7/3 | -- | -- | 7/24 | 7/23 | -- | -- |
| | 4976 | 6/26 | -- | -- | -- | -- | 7/10 | 7/1 | 8/10 | 7/9 | -- | -- | 7/24 | 7/23 | -- | -- |
| | 4977 | 6/26 | -- | -- | -- | -- | 7/10 | 7/1 | 8/10 | 7/3 | -- | -- | 7/24 | 7/23 | -- | -- |
| | 4978 | 6/26 | -- | -- | -- | -- | 7/10 | 7/1 | 8/10 | 7/3 | -- | -- | 7/24 | 7/23 | -- | -- |
| | 4979 | 6/26 | -- | -- | -- | -- | 7/10 | 7/1 | 8/10 | 7/3 | -- | -- | 7/24 | 7/23 | -- | -- |
| | 4980 | 6/26 | -- | -- | -- | -- | 7/10 | 7/1 | 8/10 | 7/3 | -- | -- | 7/24 | 7/23 | -- | -- |
| | 4981 | 6/26 | -- | -- | -- | -- | 7/10 | 7/1 | 8/10 | 7/3 | -- | -- | 7/24 | 7/23 | -- | -- |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

P

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3801

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| U-3801 | 5911 | 7/29 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/5 | 7/31 | 8/24 | 7/31 |

| | Phenol Confirmation Date |
|---|---|
| 5911 | 8/20 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3615.5

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3615 | | | RE: DF-2000 | | | |
| Sample Date: 6/26/86 | | | P.O. No.: | | | |
| Date Received: 6/27/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Water | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 4982 | 4983 | Blank | | | |
| Customer No. | 9005 | 9006 | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/L | | | | | |
| Oil and Grease | 2.4 | 3.5 | NA | | | |
| Cadmium | <0.005 | <0.005 | <0.005 | | | |
| Chromium | <0.01 | <0.01 | <0.01 | | | |
| Copper | <0.02 | <0.02 | <0.02 | | | |
| Lead | 0.010 | <0.005 | <0.005 | | | |
| Nickel | <0.02 | <0.02 | <0.02 | | | |
| Zinc | 0.015 | <0.01 | <0.01 | | | |
| Total Dissolved Solids | 130 | 150 | NA | | | |

NA: Not applicable

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March, 1983.

Supervising Analyst: [signature]

Date: August 5, 1986

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3615.6

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3615 | | | RE: DF-2000 | | | |
| Sample Date: 6/26/86 | | | P.O. No.: | | | |
| Date Received: 6/27/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 4974A | 4975 | 4976 | 4977 | 4978 | |
| Customer No. | 9001 | 9002 | 9003 | 9004 | 9025 | |
| Sample Identity | | | | | | |
| | Results in: mg/kg as received | | | | | |
| Oil and Grease<br>Solids, % | 10,200<br>85 | 9630<br>80 | 1610<br>60 | 160<br>70 | <100<br>71 | |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: August 7, 1986



recycled paper

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3615.7

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3615 | | | RE: DF-2000 | | | |
| Sample Date: 6/26/86 | | | P.O. No.: | | | |
| Date Received: 6/27/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 4979 | 4980 | 4981 | Blank* | | |
| Customer No. | 9026 | 9047 | 9048 | | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg as received | | | | | |
| Oil and Grease | 600 | 160 | <100 | NA | | |
| Chromium | NR | 11.4 | 11.7 | <0.01 | | |
| Lead | NR | 10.0 | 8.82 | <0.005 | | |
| Solids, % | 55 | 64 | 70 | NA | | |

NA: Not applicable
*: mg/L
NR: Analysis not requested

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: August 7, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3615.8

| Compound | E & E Lab. No. 86- | 4982 | 4983 | Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9005 | 9006 | | | |
| bis(2-chloroethyl)ether | | <10 | <10 | <10 | | |
| 1,3-dichlorobenzene | | <10 | <10 | <10 | | |
| 1,4-dichlorobenzene | | <10 | <10 | <10 | | |
| 1,2-dichlorobenzene | | <10 | <10 | <10 | | |
| bis(2-chloroisopropyl)ether | | <10 | <10 | <10 | | |
| N-nitrosodipropylamine | | <10 | <10 | <10 | | |
| hexachloroethane | | <10 | <10 | <10 | | |
| nitrobenzene | | <10 | <10 | <10 | | |
| isophorone | | <10 | <10 | <10 | | |
| bis(2-chloroethoxy)methane | | <10 | <10 | <10 | | |
| 1,2,4-trichlorobenzene | | <10 | <10 | <10 | | |
| naphthalene | | <10 | <10 | <10 | | |
| hexachlorobutadiene | | <10 | <10 | <10 | | |
| hexachlorocyclopentadiene | | <10 | <10 | <10 | | |
| 2-chloronaphthalene | | <10 | <10 | <10 | | |
| dimethyl phthalate | | <10 | <10 | <10 | | |
| acenaphthylene | | <10 | <10 | <10 | | |
| fluorene | | <10 | <10 | <10 | | |
| acenaphthene | | <10 | <10 | <10 | | |
| 2,4-dinitrotoluene | | <10 | <10 | <10 | | |
| 2,6-dinitrotoluene | | <10 | <10 | <10 | | |
| diethylphthalate | | <10 | <10 | <10 | | |
| 4-chlorophenyl phenyl ether | | <10 | <10 | <10 | | |
| N-nitrosodiphenylamine | | <10 | <10 | <10 | | |
| 4-bromophenyl phenyl ether | | <10 | <10 | <10 | | |
| hexachlorobenzene | | <10 | <10 | <10 | | |
| phenanthrene | | <10 | <10 | <10 | | |
| anthracene | | <10 | <10 | <10 | | |
| di-n-butyl phthalate | | <10 | <10 | <10 | | |
| fluoranthene | | <10 | <10 | <10 | | |
| benzidine | | <50 | <50 | <50 | | |
| pyrene | | <10 | <10 | <10 | | |
| butyl benzyl phthalate | | <10 | <10 | <10 | | |
| 3,3'-dichlorobenzidine | | <30 | <30 | <30 | | |
| benzo(a)anthracene | | <10 | <10 | <10 | | |
| bis(2-ethylhexyl)phthalate | | <10 | <10 | <10 | | |
| chrysene | | <10 | <10 | <10 | | |
| di-n-octyl phthalate | | <10 | <10 | <10 | | |
| benzo(b)fluoranthene | | <10 | <10 | <10 | | |
| benzo(k)fluoranthene | | <10 | <10 | <10 | | |
| benzo(a)pyrene | | <10 | <10 | <10 | | |
| indeno(1,2,3-cd)pyrene | | <10 | <10 | <10 | | |
| dibenzo(a,h)anthracene | | <10 | <10 | <10 | | |
| benzo(ghi)perylene | | <10 | <10 | <10 | | |

P5i

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3615.9

| Compound | E & E Lab. No. 86- | 4982 | 4983 | Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9005 | 9006 | | | |
| phenol | | <10 | <10 | <10 | | |
| 2-chlorophenol | | <10 | <10 | <10 | | |
| 2-nitrophenol | | <10 | <10 | <10 | | |
| 2,4-dimethylphenol | | <10 | <10 | <10 | | |
| 2,4-dichlorophenol | | <10 | <10 | <10 | | |
| 4-chloro-3-methylphenol | | <10 | <10 | <10 | | |
| 2,4,6-trichlorophenol | | <10 | <10 | <10 | | |
| 2,4-dinitrophenol | | <30 | <30 | <30 | | |
| 4-nitrophenol | | <10 | <10 | <10 | | |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | <30 | | |
| pentachlorophenol | | <30 | <30 | <30 | | |

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

U-3615.10

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| nitrobenzene-D5 | 4982 | 100 | 65 | 65 |
| | 4983 | 100 | 75 | 75 |
| 2-fluorobiphenyl | 4982 | 100 | 87 | 87 |
| | 4983 | 100 | 104 | 104 |
| terphenyl-D14 | 4982 | 100 | 80 | 80 |
| | 4983 | 100 | 144 | 144 |
| phenol-D5 | 4982 | 200 | 42 | 21 |
| | 4983 | 200 | 54 | 27 |
| 2-fluorophenol | 4982 | 200 | 86 | 43 |
| | 4983 | 200 | 109 | 54.5 |
| 2,4,6-tribromophenol | 4982 | 200 | 188 | 94 |
| | 4983 | 200 | 179 | 89.5 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PHENOL COMPOUNDS BY GC/MS*

(all results in mg/kg as received)

U-3615.11

| Compound | E & E Lab. No. 86- | 4980 | 4981 | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9047 | 9048 | | | |
| phenol | | <1 | <1 | | | |
| 2-chlorophenol | | <1 | <1 | | | |
| 2-nitrophenol | | <1 | <1 | | | |
| 2,4-dimethylphenol | | <1 | <1 | | | |
| 2,4-dichlorophenol | | <1 | <1 | | | |
| 4-chloro-3-methylphenol | | <1 | <1 | | | |
| 2,4,6-trichlorophenol | | <1 | <1 | | | |
| 2,4-dinitrophenol | | <3 | <3 | | | |
| 4-nitrophenol | | <1 | <1 | | | |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | | | |
| pentachlorophenol | | <3 | <3 | | | |

*Samples analyzed by GC/MS instead of by GC.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3615.12

| Compound | E & E Lab. No. 86- | 4974A | 4975 | 4976 | 4977 | 4978 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9001 | 9002 | 9003 | 9004 | 9025 |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <1 | <1 |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <1 | <1 |
| hexachloroethane | | <1 | <1 | <1 | <1 | <1 |
| nitrobenzene | | <1 | <1 | <1 | <1 | <1 |
| isophorone | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <1 | <1 |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| naphthalene | | 6.0 | 2.0 | <1 | <1 | <1 |
| hexachlorobutadiene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <1 | <1 |
| 2-chloronaphthalene | | <1 | <1 | <1 | <1 | <1 |
| dimethyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| acenaphthylene | | <1 | <1 | <1 | <1 | <1 |
| fluorene | | <1* | <1 | <1 | <1 | <1 |
| acenaphthene | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| diethylphthalate | | <1 | <1 | <1 | <1 | <1 |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <1 | <1 |
| 4-bromophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| phenanthrene | | 2.0 | <1* | <1 | <1 | <1 |
| anthracene | | <1* | <1 | <1 | <1 | <1 |
| di-n-butyl phthalate | | <1* | <1 | <1 | <1 | <1 |
| fluoranthene | | 4.4 | <1* | <1 | <1 | <1 |
| benzidine | | <5 | <5 | <5 | <5 | <5 |
| pyrene | | 2.7 | <1* | <1 | <1 | <1 |
| butyl benzyl phthalate | | <1* | <1 | <1 | <1 | <1 |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <3 | <3 |
| benzo(a)anthracene | | 1.5 | <1 | <1 | <1 | <1 |
| bis(2-ethylhexyl)phthalate | | 4.0 | 1.1 | 3.2 | <1 | <1 |
| chrysene | | 1.8 | <1* | <1 | <1 | <1 |
| di-n-octyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| benzo(b)fluoranthene | | 1.1 | <1* | <1 | <1 | <1 |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(a)pyrene | | <1* | <1 | <1 | <1 | <1 |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <1 | <1 |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <1 | <1 |
| benzo(ghi)perylene | | <1 | <1 | <1 | <1 | <1 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS
(Cont.)

(all results in mg/kg, as received)

U-3615.13

| Compound | E & E Lab. No. 86- | 4979 | Blank | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9026 | | | | |
| bis(2-chloroethyl)ether | | <1 | <1 | | | |
| 1,3-dichlorobenzene | | <1 | <1 | | | |
| 1,4-dichlorobenzene | | <1 | <1 | | | |
| 1,2-dichlorobenzene | | <1 | <1 | | | |
| bis(2-chloroisopropyl)ether | | <1 | <1 | | | |
| N-nitrosodipropylamine | | <1 | <1 | | | |
| hexachloroethane | | <1 | <1 | | | |
| nitrobenzene | | <1 | <1 | | | |
| isophorone | | <1 | <1 | | | |
| bis(2-chloroethoxy)methane | | <1 | <1 | | | |
| 1,2,4-trichlorobenzene | | <1 | <1 | | | |
| naphthalene | | <1 | <1 | | | |
| hexachlorobutadiene | | <1 | <1 | | | |
| hexachlorocyclopentadiene | | <1 | <1 | | | |
| 2-chloronaphthalene | | <1 | <1 | | | |
| dimethyl phthalate | | <1 | <1 | | | |
| acenaphthylene | | <1 | <1 | | | |
| fluorene | | <1 | <1 | | | |
| acenaphthene | | <1 | <1 | | | |
| 2,4-dinitrotoluene | | <1 | <1 | | | |
| 2,6-dinitrotoluene | | <1 | <1 | | | |
| diethylphthalate | | <1 | <1 | | | |
| 4-chlorophenyl phenyl ether | | <1 | <1 | | | |
| N-nitrosodiphenylamine | | <1 | <1 | | | |
| 4-bromophenyl phenyl ether | | <1 | <1 | | | |
| hexachlorobenzene | | <1 | <1 | | | |
| phenanthrene | | <1 | <1 | | | |
| anthracene | | <1 | <1 | | | |
| di-n-butyl phthalate | | <1 | <1 | | | |
| fluoranthene | | <1 | <1 | | | |
| benzidine | | <5 | <5 | | | |
| pyrene | | <1 | <1 | | | |
| butyl benzyl phthalate | | <1 | <1 | | | |
| 3,3'-dichlorobenzidine | | <3 | <3 | | | |
| benzo(a)anthracene | | <1 | <1 | | | |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | | | |
| chrysene | | <1 | <1 | | | |
| di-n-octyl phthalate | | <1 | <1 | | | |
| benzo(b)fluoranthene | | <1 | <1 | | | |
| benzo(k)fluoranthene | | <1 | <1 | | | |
| benzo(a)pyrene | | <1 | <1 | | | |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | | | |
| dibenzo(a,h)anthracene | | <1 | <1 | | | |
| benzo(ghi)perylene | | <1 | <1 | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3615.14

| Compound | E & E Lab. No. 86- | 4974A | 4975 | 4976 | 4977 | 4978 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9001 | 9002 | 9003 | 9004 | 9025 |
| phenol | | <1 | <1 | <1 | <1 | <1 |
| 2-chlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <3 | <3 |
| 4-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <3 | <3 |
| pentachlorophenol | | <3 | <3 | <3 | <3 | <3 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3615.15

| Compound | E & E Lab. No. 86- | 4979 | Blank | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9026 | | | | |
| phenol | | <1 | <1 | | | |
| 2-chlorophenol | | <1 | <1 | | | |
| 2-nitrophenol | | <1 | <1 | | | |
| 2,4-dimethylphenol | | <1 | <1 | | | |
| 2,4-dichlorophenol | | <1 | <1 | | | |
| 4-chloro-3-methylphenol | | <1 | <1 | | | |
| 2,4,6-trichlorophenol | | <1 | <1 | | | |
| 2,4-dinitrophenol | | <3 | <3 | | | |
| 4-nitrophenol | | <1 | <1 | | | |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | | | |
| pentachlorophenol | | <3 | <3 | | | |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3615.16

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| nitrobenzene-D5 | 4974A | 3.3 | 2.3 | 70 |
| | 4975 | 3.3 | * | -- |
| | 4976 | 3.3 | 1.2 | 36 |
| | 4977 | 3.3 | 1.7 | 52 |
| | 4978 | 3.3 | 1.8 | 55 |
| | 4979 | 3.3 | 1.6 | 48 |
| 2-fluorobiphenyl | 4974A | 3.3 | 2.7 | 82 |
| | 4975 | 3.3 | * | -- |
| | 4976 | 3.3 | 2.1 | 64 |
| | 4977 | 3.3 | 3.1 | 94 |
| | 4978 | 3.3 | 3.1 | 94 |
| | 4979 | 3.3 | 2.9 | 88 |
| terphenyl-D14 | 4974A | 3.3 | 1.9 | 58 |
| | 4975 | 3.3 | * | -- |
| | 4976 | 3.3 | 1.8 | 55 |
| | 4977 | 3.3 | 2.9 | 88 |
| | 4978 | 3.3 | 3.4 | 103 |
| | 4979 | 3.3 | 2.5 | 76 |
| phenol-D5 | 4974A | 6.6 | 2.4 | 36 |
| | 4975 | 6.6 | * | -- |
| | 4976 | 6.6 | 1.2 | 18 |
| | 4977 | 6.6 | 1.8 | 27 |
| | 4978 | 6.6 | 1.7 | 26 |
| | 4979 | 6.6 | 1.6 | 24 |
| 2-fluorophenol | 4974A | 6.6 | 2.3 | 35 |
| | 4975 | 6.6 | * | -- |
| | 4976 | 6.6 | * | -- |
| | 4977 | 6.6 | 1.5 | 23 |
| | 4978 | 6.6 | 1.6 | 24 |
| | 4979 | 6.6 | * | -- |
| 2,4,6-tribromophenol | 4974A | 6.6 | 3.6 | 55 |
| | 4975 | 6.6 | * | -- |
| | 4976 | 6.6 | 2.9 | 44 |
| | 4977 | 6.6 | 3.1 | 47 |
| | 4978 | 6.6 | 4.7 | 71 |
| | 4979 | 6.6 | 4.4 | 67 |

*<1 mg/kg recovered.

Note: Insufficient sample size remaining for reextraction of sample 4975, poor recoveries believed due to matrix interferences. Reextraction of several samples demonstrated matrix interferences with phenol-D5 and 2-fluorophenol recoveries (24% minimum acceptable recoveries for EPA Contract Lab Program). All other recoveries are within the acceptable range.

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY--EPA QUALITY ASSURANCE MATERIALS

U-3615.17

| Compound | True Value (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|
| bis(2-chloroethyl)ether | 48.2 | 45.3 | 94.0 |
| 1,3-dichlorobenzene | 52.0 | 37.0 | 71.2 |
| 1,2-dichlorobenzene | 24.7 | 17.6 | 71.3 |
| N-nitrosodi-n-propylamine | 34.8 | 27.8 | 79.9 |
| isophorone | 76.7 | 79.5 | 104 |
| bis(2-chloroethoxy)methane | 48.6 | 44.1 | 90.7 |
| 1,2,4-trichlorobenzene | 25.3 | 18.8 | 74.3 |
| hexachlorobutadiene | 49.6 | 28.5 | 57.5 |
| 2-chloronaphthalene | 25.4 | 26.1 | 103 |
| 2,6-dinitrotoluene | 76.5 | 81.7 | 107 |
| 2,4-dinitrotoluene | 73.8 | 71.3 | 96.6 |
| diethyl phthalate | 25.1 | 15.5 | 61.8 |
| hexachlorobenzene | 35.7 | 39.2 | 110 |
| phenanthrene | 40.2 | 41.9 | 104 |
| dibutylphthalate | 24.9 | 21.4 | 85.9 |
| pyrene | 60.2 | 65.6 | 109 |
| benzo(a)anthracene | 73.9 | 74.8 | 101 |
| di-n-octylphthalate | 43.9 | 38.4 | 87.5 |
| benzo(k)fluoranthene | 45.7 | 30.4 | 66.5 |

These recoveries are acceptable with EPA guidelines.

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY--EPA QUALITY ASSURANCE MATERIALS

U-3615.18

| Compound | True Value (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|
| 2-chlorophenol | 30 | 20 | 67 |
| 2-nitrophenol | 50 | 39 | 78 |
| phenol | 100 | 30 | 30 |
| 2,4-dimethylphenol | 30 | 15 | 50 |
| 2,4-dichlorophenol | 50 | 35 | 70 |
| 2,4,6-trichlorophenol | 25 | 21 | 84 |
| 4-chloro-3-methylphenol | 75 | 57 | 76 |
| 2-methyl-4,6-dinitrophenol | 250 | 200 | 80 |
| pentachlorophenol | 75 | 50 | 67 |
| 4-nitrophenol | 50 | 11 | 22 |

These recoveries are acceptable with EPA guidelines.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PHENOL COMPOUNDS BY GC/MS*

(all results in ug/L)

U-3615.19

| Compound | E & E Lab. No. 86- | 4983 | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9006 | | | | |
| phenol | | <10 | | | | |
| 2-chlorophenol | | <10 | | | | |
| 2-nitrophenol | | <10 | | | | |
| 2,4-dimethylphenol | | <10 | | | | |
| 2,4-dichlorophenol | | <10 | | | | |
| 4-chloro-3-methylphenol | | <10 | | | | |
| 2,4,6-trichlorophenol | | <10 | | | | |
| 2,4-dinitrophenol | | <30 | | | | |
| 4-nitrophenol | | <10 | | | | |
| 4,6-dinitro-2-methylphenol | | <30 | | | | |
| pentachlorophenol | | <30 | | | | |

*Samples analyzed by GC/MS instead of by GC.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3615.20

| Parameter | E & E Laboratory No. 86- | | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Solids, % | 4981 | 70 | 70 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3615.21

| Parameter | E & E Laboratory No. 86- | Original Analysis | Replicate Analysis | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| Total Dissolved Solids | 4982 | 130 | 110 | 16.7 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3615.22

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/L) | | | |
| Lead | 4982 | 0.010 | 0.025 | 0.036 | 104 |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3615.23

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Oil and Grease | 30,000 | 26,200 | 12.7 |
| Cadmium | 940 | 983 | 4.6 |
| Chromium | 1030 | 986 | 4.1 |
| Copper | 1030 | 1018 | 1.2 |
| Lead | 53.0 | 52.6 | 0.8 |
| Nickel | 1020 | 988 | 3.1 |
| Zinc | 1010 | 1017 | 0.1 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3615.24

| Compound | E & E Lab. No. 86- | Blank | Blank | 4974A* | 4975* | 4976 |
|---|---|---|---|---|---|---|
| | Sample Identity | 7/1/86 | 7/1/86 | 9001 | 9002 | 9003 |
| chlorobenzene | | <250 | <250 | <2500 | <2500 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <5000 | <5000 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <5000 | <5000 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <5000 | <5000 | <500 |
| benzene | | <250 | <250 | <2500 | <2500 | <250 |
| total xylenes | | <500 | <500 | 26,000 | 24,000 | <500 |
| toluene | | <250 | <250 | <2500 | <2500 | <250 |
| ethylbenzene | | <250 | <250 | <2500 | <2500 | <250 |

*Sample confirmed--results positive.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC
(Cont.)

(all results in ug/kg as received)

U-3615.25

| Compound | E & E Lab. No. 86- | 4977 | 4978 | 4979 | 4980 | 4981 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9004 | 9025 | 9026 | 9047 | 9048 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3615.26

| Compound | E & E Lab. No. 86- | Blank | 4974A* | 4975* | 4976 | 4977 | 4978 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 7/7/86 | 9001 | 9002 | 9003 | 9004 | 9025 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | 1,200 | 2000 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | 64 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | 2300 | 10,000 | <250 | <250 | <250 |
| trichloroethene | | <250 | 1200 | 510 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

* Sample confirmed--results positive.

NOTE: Due to low level artifacts present in the methanol used for standard preparation and sample extraction, all sample results have been corrected by subtracting the amount found in the blank. Actual amounts found in the blanks are reported.

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(Cont.)

(all results in ug/kg as received)

U-3615.27

| Compound | E & E Lab. No. 86- | 49[illegible]9 | 4980 | 4981 | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9026 | 9047 | 9048 | | | |
| carbon tetrachloride | | <250 | <250 | <250 | | | |
| 1,2-dichloroethane | | <100 | <100 | <100 | | | |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | | | |
| 1,1-dichloroethane | | <100 | <100 | <100 | | | |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | | | |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | | | |
| chloroethane | | <500 | <500 | <500 | | | |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | | | |
| chloroform | | <250 | <250 | <250 | | | |
| 1,1-dichloroethene | | <100 | <100 | <100 | | | |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | | | |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | | | |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | | | |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | | | |
| methylene chloride | | <50 | <50 | <50 | | | |
| chloromethane | | <500 | <500 | <500 | | | |
| bromomethane | | <500 | <500 | <500 | | | |
| bromoform | | <1000 | <1000 | <1000 | | | |
| bromodichloromethane | | <250 | <250 | <250 | | | |
| fluorotrichloromethane | | <500 | <500 | <500 | | | |
| dichlorodifluoromethane | | <500 | <500 | <500 | | | |
| chlorodibromomethane | | <250 | <250 | <250 | | | |
| tetrachloroethene | | <250 | <250 | <250 | | | |
| trichloroethene | | <250 | <250 | <250 | | | |
| vinyl chloride | | <500 | <500 | <500 | | | |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS
(all results in ug/L)

U-3615.28

| Compound | E & E Lab. No. 86- | 4982* | 4983* | Blank | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9005 | 9006 | 7/3/86 | | | |
| carbon tetrachloride | | <0.12 | <0.12 | <0.12 | | | |
| 1,2-dichloroethane | | <0.03 | <0.03 | <0.03 | | | |
| 1,1,1-trichloroethane | | 0.89 | 0.57 | <0.03 | | | |
| 1,1-dichloroethane | | <0.07 | <0.07 | <0.07 | | | |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | <0.02 | | | |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | <0.03 | | | |
| chloroethane | | <0.52 | <0.52 | <0.52 | | | |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | <0.13 | | | |
| chloroform | | <0.05 | <0.05 | 0.08 | | | |
| 1,1-dichloroethene | | <0.13 | <0.13 | <0.13 | | | |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | <0.10 | | | |
| 1,2-dichloropropane | | <0.04 | <0.04 | <0.04 | | | |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | <0.34 | | | |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | <0.20 | | | |
| methylene chloride | | 32.2 | 24.8 | 2.36 | | | |
| chloromethane | | <0.08 | <0.08 | <0.08 | | | |
| bromomethane | | <1.18 | <1.18 | <1.18 | | | |
| bromoform | | <0.20 | <0.20 | <0.20 | | | |
| bromodichloromethane | | <0.10 | <0.10 | <0.10 | | | |
| fluorotrichloromethane | | <2.0 | <2.0 | <2.0 | | | |
| dichlorodifluoromethane | | <1.81 | <1.81 | <1.81 | | | |
| chlorodibromomethane | | <0.09 | <0.09 | <0.09 | | | |
| tetrachloroethene | | 14.6 | 8.1 | <0.03 | | | |
| trichloroethene | | 0.59 | 0.51 | <0.12 | | | |
| vinyl chloride | | <0.18 | <0.18 | <0.18 | | | |

* Sample confirmed--results positive.

NOTE: Due to low level artifacts present in the methanol used for standard preparation and sample extraction, all sample results have been corrected by subtracting the amount found in the blank. Actual amounts found in the blanks are reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L)

U-3615.29

| Compound | E & E Lab. No. 86- | 4982 | 4983 | Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9005 | 9006 | 6/30/86 | | |
| chlorobenzene | | <0.20 | <0.20 | <0.20 | | |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | <0.40 | | |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | <0.40 | | |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | <0.30 | | |
| benzene | | <0.20 | <0.20 | <0.20 | | |
| total xylenes | | <1.0 | <1.0 | <1.0 | | |
| toluene | | <0.20 | <0.20 | <0.20 | | |
| ethylbenzene | | <0.20 | <0.20 | <0.20 | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSES
FOR PESTICIDES/PCB AND HERBICIDES

(all results in ug/L)

U-3615.30

| | E & E Lab. No. 86- | 4982 | 4983 | Blank | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9005 | 9006 | | | | | |
| Aldrin | | <0.05 | <0.05 | <0.05 | | | | |
| a-BHC | | <0.05 | <0.05 | <0.05 | | | | |
| b-BHC | | <0.05 | <0.05 | <0.05 | | | | |
| g-BHC | | <0.05 | <0.05 | <0.05 | | | | |
| d-BHC | | <0.05 | <0.05 | <0.05 | | | | |
| Chlordane | | <0.50 | <0.50 | <0.50 | | | | |
| 4,4'-DDD | | <0.10 | <0.10 | <0.10 | | | | |
| 4,4'-DDE | | <0.10 | <0.10 | <0.10 | | | | |
| 4,4'-DDT | | <0.10 | <0.10 | <0.10 | | | | |
| Dieldrin | | <0.10 | <0.10 | <0.10 | | | | |
| Endosulfan I | | <0.05 | <0.05 | <0.05 | | | | |
| Endosulfan II | | <0.10 | <0.10 | <0.10 | | | | |
| Endosulfan sulfate | | <0.10 | <0.10 | <0.10 | | | | |
| Endrin | | <0.10 | <0.10 | <0.10 | | | | |
| Endrin aldehyde | | <0.10 | <0.10 | <0.10 | | | | |
| Heptachlor | | <0.05 | <0.05 | <0.05 | | | | |
| Heptachlor epoxide | | <0.05 | <0.05 | <0.05 | | | | |
| PCB - 1016 | | <0.50 | <0.50 | <0.50 | | | | |
| PCB - 1221 | | <0.50 | <0.50 | <0.50 | | | | |
| PCB - 1232 | | <0.50 | <0.50 | <0.50 | | | | |
| PCB - 1242 | | <0.50 | <0.50 | <0.50 | | | | |
| PCB - 1248 | | <0.50 | <0.50 | <0.50 | | | | |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | | | | |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | | | | |
| 2,4-D | | <0.5 | <0.5 | <0.5 | | | | |
| 2,4,5-T | | <0.05 | <0.05 | <0.05 | | | | |
| 2,4,5-TP (Silvex) | | <0.05 | <0.05 | <0.05 | | | | |
| Toxaphene | | <1.0 | <1.0 | <1.0 | | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSES
FOR PESTICIDES/PCB AND HERBICIDES

(mg/kg as received)

U-3615.31

| | E & E Lab. No. 86- | 4974A | 4975 | 4976 | 4977 | 4978 | 4979* | Blank |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9001 | 9002 | 9003 | 9004 | 9025 | 9026 | |
| Aldrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| a-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| b-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| g-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| d-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Chlordane | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,4'-DDD | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1.7 | <1.0 |
| 4,4'-DDE | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,4'-DDT | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | 1.3 | <1.0 |
| Dieldrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan I | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan II | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan sulfate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endrin aldehyde | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Heptachlor | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Heptachlor epoxide | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1016 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1221 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1232 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1242 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1248 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-D | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4,5-T | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.5 |
| 2,4,5-TP (Silvex) | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.05 |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <0.05 |

*Sample confirmed-results positive.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/L)

U-3615.33

| | E & E Lab. No. 86- | 4982 | 4983 | Blank | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9005 | 9006 | 7/1/86 | | | | |
| Naled | | <0.10 | <0.10 | <0.10 | | | | |
| Phorate | | <0.15 | <0.15 | <0.15 | | | | |
| Disulfoton | | <0.20 | <0.20 | <0.20 | | | | |
| Chlorpyrifos | | <0.30 | <0.30 | <0.30 | | | | |
| Dimethoate | | <0.30 | <0.30 | <0.30 | | | | |
| Malathion | | <0.30 | <0.30 | <0.30 | | | | |
| Mevinphos | | <0.30 | <0.30 | <0.30 | | | | |
| Parathion | | <0.30 | <0.30 | <0.30 | | | | |
| Methyl parathion | | <0.30 | <0.30 | <0.30 | | | | |
| Diazinon | | <0.60 | <0.60 | <0.60 | | | | |
| Methyl azinphos | | <1.5 | <1.5 | <1.5 | | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in mg/kg as received)

U-3615.34

| | E & E Lab. No. 86- | 4974A | 4975 | 4976 | 4977 | 4978 | 4979 | Blank |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9001 | 9002 | 9003 | 9004 | 9025 | 9026 | 7/1/86 |
| Naled | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Phorate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Disulfoton | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Chlorpyrifos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dimethoate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Malathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Mevinphos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Parathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Methyl parathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Diazinon | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Methyl azinphos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3615.35

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 1,2-Dichlorobenzene | 4983 | <0.40 | 10.0 | 9.4 | 94 |
| 1,3-Dichlorobenzene | 4983 | <0.40 | 10.0 | 9.3 | 93 |
| 1,4-Dichlorobenzene | 4983 | <0.30 | 10.0 | 9.4 | 94 |
| benzene | 4983 | <0.20 | 10.0 | 10.9 | 109 |
| toluene | 4983 | <0.20 | 10.0 | 9.2 | 92 |
| ethyl benzene | 4983 | <0.20 | 10.0 | 9.0 | 90 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3615.36

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 1,2-Dichlorobenzene | 4981 | <500 | 5000 | 4610 | 92.2 |
| 1,3-Dichlorobenzene | 4981 | <500 | 5000 | 3815 | 76.3 |
| 1,4-Dichlorobenzene | 4981 | <500 | 5000 | 4285 | 85.7 |
| benzene | 4981 | <250 | 5000 | 2745 | 54.9 |
| toluene | 4981 | <250 | 5000 | 5600 | 112 |
| ethyl benzene | 4981 | <250 | 5000 | 4205 | 84.1 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3615.37

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| carbon tetrachloride | 4981 | <250 | 1250 | 863.8 | 69.1 |
| 1,2-dichloroethane | 4981 | <100 | 1250 | 820.0 | 65.6 |
| 1,1,1-trichloroethane | 4981 | <250 | 1250 | 875.0 | 70.0 |
| 1,1-dichloroethane | 4981 | <100 | 1250 | 961.3 | 76.9 |
| chloroethane | 4981 | <500 | 1250 | 1245 | 99.6 |
| chloroform | 4981 | <250 | 1250 | 922.5 | 73.8 |
| trans-1,2-dichloroethene | 4981 | <100 | 1250 | 777.5 | 62.2 |
| methylene chloride | 4981 | <50 | 1250 | 658.8 | 52.7 |
| chloromethane | 4981 | <500 | 1250 | 1112 | 89.0 |
| bromomethane | 4981 | <500 | 1250 | 956.2 | 76.5 |
| bromoform | 4981 | <1000 | 1250 | 1098 | 87.8 |
| bromodichloromethane | 4981 | <250 | 1250 | 675.0 | 54.0 |
| trichloroethene | 4981 | <250 | 1250 | 1219 | 97.5 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3615.38

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| carbon tetrachloride | 4983 | <0.12 | 10.0 | 8.70 | 87.0 |
| 1,2-dichloroethane | 4983 | <0.03 | 10.0 | 8.46 | 84.6 |
| 1,1,1-trichloroethane | 4983 | 0.57 | 10.0 | 10.2 | 96.2 |
| 1,1-dichloroethane | 4983 | <0.07 | 10.0 | 8.64 | 86.4 |
| chloroethane | 4983 | <0.52 | 10.0 | 10.0 | 100 |
| chloroform | 4983 | <0.05 | 10.0 | 8.57 | 85.7 |
| trans-1,2-dichloroethene | 4983 | <0.10 | 10.0 | 10.0 | 100 |
| methylene chloride | 4983 | 24.8 | 10.0 | 39.1 | 143 |
| chloroemthane | 4983 | <0.08 | 10.0 | 10.0 | 100 |
| bromomethane | 4983 | <1.81 | 10.0 | 8.46 | 84.6 |
| bromoform | 4983 | <0.20 | 10.0 | 8.89 | 88.9 |
| bromodichloromethane | 4983 | <0.10 | 10.0 | 9.42 | 94.2 |
| trichloroethene | 4983 | 0.51 | 10.0 | 10.3 | 97.9 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3615.39

| Compound | E & E Laboratory No. 86- | ug/L | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Aldrin | 4982 | <0.05 | <0.05 | -- |
| a-BHC | 4982 | <0.05 | <0.05 | -- |
| b-BHC | 4982 | <0.05 | <0.05 | -- |
| g-BHC | 4982 | <0.05 | <0.05 | -- |
| d-BHC | 4982 | <0.05 | <0.05 | -- |
| Chlordane | 4982 | <0.50 | <0.50 | -- |
| 4,4'-DDD | 4982 | <0.10 | <0.10 | -- |
| 4,4'-DDE | 4982 | <0.10 | <0.10 | -- |
| 4,4'-DDT | 4982 | <0.10 | <0.10 | -- |
| Dieldrin | 4982 | <0.10 | <0.10 | -- |
| Endosulfan I | 4982 | <0.05 | <0.05 | -- |
| Endosulfan II | 4982 | <0.10 | <0.10 | -- |
| Endosulfan sulfate | 4982 | <0.10 | <0.10 | -- |
| Endrin | 4982 | <0.10 | <0.10 | -- |
| Endrin aldehyde | 4982 | <0.10 | <0.10 | -- |
| Heptachlor | 4982 | <0.05 | <0.05 | -- |
| Heptachlor epoxide | 4982 | <0.05 | <0.05 | -- |
| PCB - 1016 | 4982 | <0.50 | <0.50 | -- |
| PCB - 1221 | 4982 | <0.50 | <0.50 | -- |
| PCB - 1232 | 4982 | <0.50 | <0.50 | -- |
| PCB - 1242 | 4982 | <0.50 | <0.50 | -- |
| PCB - 1248 | 4982 | <0.50 | <0.50 | -- |
| PCB - 1254 | 4982 | <1.0 | <1.0 | -- |
| PCB - 1260 | 4982 | <1.0 | <1.0 | -- |
| Toxaphene | 4982 | <1.0 | <1.0 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3615.40

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 2,4-D | 4982 | <0.5 | 100 | 76 | 76 |
| Silvex | 4982 | <0.05 | 100 | 79 | 79 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3615.41

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg as received) | | | |
| 2,4-D | 4977 | <1.0 | 4.0 | 2.8 | 70 |
| Silvex | 4977 | <1.0 | 4.0 | 2.1 | 53 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3615.42

| Parameter | E & E Laboratory No. 86- | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Naled | 4982 | <0.10 | <0.10 | -- |
| Phorate | 4982 | <0.15 | <0.15 | -- |
| Disulfoton | 4982 | <0.20 | <0.20 | -- |
| Chlorpyrifos | 4982 | <0.30 | <0.30 | -- |
| Dimethoate | 4982 | <0.30 | <0.30 | -- |
| Malathion | 4982 | <0.30 | <0.30 | -- |
| Mevinphos | 4982 | <0.30 | <0.30 | -- |
| Parathion | 4982 | <0.30 | <0.30 | -- |
| Parathion Methyl | 4982 | <0.30 | <0.30 | -- |
| Diazinon | 4982 | <0.60 | <0.60 | -- |
| Azinphos Methyl | 4982 | <1.5 | <1.5 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-3801.2

| Compound | E & E Lab. No. 86- | 5911 | Blank | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9005 | 7/31/86 | | | |
| phenol | | 4.8 | <0.14 | | | |
| 2-chlorophenol | | <10* | <0.31 | | | |
| 2-nitrophenol | | <10* | <0.45 | | | |
| 2,4-dimethylphenol | | <10* | <0.32 | | | |
| 2,4-dichlorophenol | | <10* | <0.39 | | | |
| 4-chloro-3-methylphenol | | <10* | <0.36 | | | |
| 2,4,6-trichlorophenol | | <10* | <0.64 | | | |
| 2,4-dinitrophenol | | <13 | <13 | | | |
| 4-nitrophenol | | <10* | <2.8 | | | |
| 4,6-dinitro-2-methylphenol | | <16 | <16 | | | |
| pentachlorophenol | | <10* | <7.4 | | | |

*Elevated detection limits due to matrix interferences.

QUALITY CONTROL FOR SPIKED
SAMPLES OF WATER ANALYSIS

U-3801.1

| Compound | E & E Lab. No. 86-<br>DI Spike | ug/L | | | |
|---|---|---|---|---|---|
| | | Original Analysis | Spike Amount | Amount Determined | % Recovery |
| phenol | | <0.14 | 40 | 16 | 40 |
| 2-chlorophenol | | <0.31 | 40 | 16 | 40 |
| 2-nitrophenol | | <0.45 | 40 | 27 | 68 |
| 2,4-dimethylphenol | | <0.32 | 40 | 26 | 65 |
| 2,4-dichlorophenol | | <0.39 | 40 | 27 | 68 |
| 4-chloro-3-methylphenol | | <0.36 | 40 | 28 | 70 |
| 2,4,6-trichlorophenol | | <0.64 | 40 | 29 | 73 |
| 4-nitrophenol | | <2.8 | 40 | 7.4 | 19 |
| 4,6-dinitro-2-methylphenol | | <16 | 40 | 24 | 60 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3809.2

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 5940 | 9012 | 0165-SO-001-GS-86-9012 |
| 5941 | 9013 | 0165-SO-001-GS-86-9013 |
| 5942 | 9014 | 0165-SO-001-GS-86-9014 |
| 5943 | 9141 | 0165-SO-001-GS-86-9141 |
| 5944 | 9160 | 0165-SO-001-GS-36-9160 |
| 5945 | 9161 | 0165-SO-001-GS-86-9161 |
| 5946 | 9162 | 0165-SO-001-GS-86-9162 |
| 5947 | 9163 | 0165-SO-001-GS-86-9163 |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3809

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(14/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Aral | Dead | Anal | Dead | Anal |
| 3809 | 5940 | 7/30 | -- | -- | -- | -- | 8/13 | 7/31 | 9/9 | 8/5 | -- | -- | 8/27 | 8/1 | -- | -- |
| | 5941 | 7/30 | -- | -- | -- | -- | 8/13 | 7/31 | 9/9 | 8/4 | -- | -- | 8/27 | 8/1 | -- | -- |
| | 5942 | 7/30 | -- | -- | -- | -- | 8/13 | 7/31 | 9/9 | 8/4 | -- | -- | 8/27 | 8/1 | -- | -- |
| | 5943 | 7/30 | -- | -- | -- | -- | 8/13 | 7/31 | 9/9 | 8/4 | -- | -- | 8/27 | 8/1 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3809.1

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3809 | 5940 | 7/30 | 8/13 | 8/5 | 8/6 | 8/5 | 9/4 | 8/8 | 8/6 | 7/31 | 9/9 | 8/7 | 8/6 | 7/31 | 8/13 | 8/6 | -- | -- | -- | -- |
| | 5941 | 7/30 | 8/13 | 8/5 | 8/6 | 8/5 | 9/4 | 8/8 | 8/6 | 7/31 | 9/9 | 8/7 | 8/6 | 7/31 | 8/13 | 8/6 | -- | -- | -- | -- |
| | 5942 | 7/30 | 8/13 | 8/5 | 8/6 | 8/5 | 9/4 | 8/8 | 8/6 | 7/31 | 9/9 | 8/7 | 8/6 | 7/31 | 8/13 | 8/6 | -- | -- | -- | -- |
| | 5943 | 7/30 | 8/13 | 8/5 | 8/6 | 8/5 | 9/4 | 8/8 | 8/6 | 7/31 | 9/9 | 8/7 | 8/6 | 7/31 | 8/13 | 8/6 | -- | -- | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

ecology and environment, inc.
International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3809.3

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: | U-3809 | | RE: | DF-2000 | | |
| Sample Date: | 7/30/86 | | P.O. No.: | | | |
| Date Received: | 7/31/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Soil | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 5940 | 5941 | 5942 | 5943 | | |
| Customer No. | 9012 | 9013 | 9014 | 9141 | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg unless noted | | | | | |
| Oil and Grease | 200 | <100 | <100 | <100 | | |
| Solids, % | 83 | 75 | 91 | 81 | | |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA 1982.

Supervising Analyst: Mary Hairy/bs

Date: September 5, 1986



recycled paper

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3809.4

| Compound | E & E Lab. No. 86- | Blank | 5940 | 5941 | 5942 | 5943 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/5/86 | 9012 | 9013 | 9014 | 9141 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANTS
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3809.5

| Compound | E & E Lab. No. 86- | 5940 | 5941 | 5942 | 5943 | Lab Blank |
|---|---|---|---|---|---|---|
| | Sample Identity | 9012 | 9013 | 9014 | 9141 | ug/L |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <1 | <10 |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <1 | <10 |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <1 | <10 |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <1 | <10 |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <1 | <10 |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <1 | <10 |
| hexachloroethane | | <1 | <1 | <1 | <1 | <10 |
| nitrobenzene | | <1 | <1 | <1 | <1 | <10 |
| isophorone | | <1 | <1 | <1 | <1 | <10 |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <1 | <10 |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <1 | <10 |
| naphthalene | | <1 | <1 | <1 | <1 | <10 |
| hexachlorobutadiene | | <1 | <1 | <1 | <1 | <10 |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <1 | <10 |
| 2-chloronaphthalene | | <1 | <1 | <1 | <1 | <10 |
| dimethyl phthalate | | <1 | <1 | <1 | <1 | <10 |
| acenaphthylene | | <1 | <1 | <1 | <1 | <10 |
| fluorene | | <1 | <1 | <1 | <1 | <10 |
| acenaphthene | | <1 | <1 | <1 | <1 | <10 |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <1 | <10 |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <1 | <10 |
| diethylphthalate | | <1 | <1 | <1 | <1 | <10 |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <1 | <10 |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <1 | <10 |
| 4-bromophenyl phenyl ether | | <1 | <1 | <1 | <1 | <10 |
| hexachlorobenzene | | <1 | <1 | <1 | <1 | <10 |
| phenanthrene | | <1 | <1 | <1 | <1 | <10 |
| anthracene | | <1 | <1 | <1 | <1 | <10 |
| di-n-butyl phthalate | | <1 | <1 | <1 | <1 | <10 |
| fluoranthene | | <1 | <1 | <1 | <1 | <10 |
| benzidine | | <5 | <5 | <5 | <5 | <50 |
| pyrene | | <1 | <1 | <1 | <1 | <10 |
| butyl benzyl phthalate | | <1 | <1 | <1 | <1 | <10 |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <3 | <30 |
| benzo(a)anthracene | | <1 | <1 | <1 | <1 | <10 |
| bis(2-ethylhexyl)phthalate | | <1* | <1* | <1 | <1 | <10 |
| chrysene | | <1 | <1 | <1 | <1 | <10 |
| di-n-octyl phthalate | | 2.3 | <1* | <1* | <1* | <10 |
| benzo(b)fluoranthene | | <1 | <1 | <1 | <1 | <10 |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <1 | <10 |
| benzo(a)pyrene | | <1 | <1 | <1 | <1 | <10 |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <1 | <10 |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <1 | <10 |
| benzo(ghi)perylene | | <1 | <1 | <1 | <1 | <10 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/g as received)

U-3809.6

| | E & E Lab. No. 86- | Blank | 5940 | 5941 | 5942 | 5943 | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 7/31/86 | 9012 | 9013 | 9014 | 9141 | | |
| Naled | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Phorate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Disulfoton | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Chlorpyrifos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Dimethoate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Malathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Mevinphos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Parathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Methyl parathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Diazinon | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Methyl azinphos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3809.7

| Parameter | E & E Laboratory No. 86- | (ug/g) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Naled | 5942 | <1.0 | <1.0 | -- |
| Phorate | 5942 | <1.0 | <1.0 | -- |
| Disulfoton | 5942 | <1.0 | <1.0 | -- |
| Chlorpyrifos | 5942 | <1.0 | <1.0 | -- |
| Dimethoate | 5942 | <1.0 | <1.0 | -- |
| Malathion | 5942 | <1.0 | <1.0 | -- |
| Mevinphos | 5942 | <1.0 | <1.0 | -- |
| Parathion | 5942 | <1.0 | <1.0 | -- |
| Methyl parathion | 5942 | <1.0 | <1.0 | -- |
| Diazinon | 5942 | <1.0 | <1.0 | -- |
| Methyl azinphos | 5942 | <1.0 | <1.0 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3809.8

| Compound | E & E Lab. No. 86- | Blank | 5940 | 5941 | 5942 | 5943 | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/5/86 | 9012 | 9013 | 9014 | 9141 | |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | |
| chloroform | | <250 | <250 | <250 | <250 | <250 | |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SAMPLES

U-3809.10

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| 1,2,4-Trichlorobenzene | 5942 | <1 | 3.3 | 2.9 | 87.9 |
| Acenaphthene | 5942 | <1 | 3.3 | 3.0 | 90.9 |
| 2,4 Dinitrotoluene | 5942 | <1 | 3.3 | 2.6 | 78.8 |
| Pyrene | 5942 | <1 | 3.3 | 3.0 | 90.9 |
| N-Nitrosodi-n-Propylamine | 5942 | <1 | 3.3 | 2.9 | 87.9 |
| 1,4-Dichlorobenzene | 5942 | <1 | 3.3 | 2.8 | 84.8 |
| Pentachlorophenol | 5942 | <3 | 6.6 | 5.0 | 75.8 |
| Phenol | 5942 | <1 | 6.6 | 3.5 | 53.0 |
| 2-Chlorophenol | 5942 | <1 | 6.6 | 5.0 | 75.8 |
| 4-Chloro-3-Methylphenol | 5942 | <1 | 6.6 | 5.7 | 86.4 |
| 4-Nitrophenol | 5942 | <1 | 6.6 | 3.4 | 51.5 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PRIORITY POLLUTANT PESTICIDES/PCB'S AND HERBICIDES BY GC

(all results in mg/kg as received)

U-3809.11

| | E & E Lab. No. 86- | Blank | 5940 | 5941 | 5942 | 5943 | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 7/31/86 | 9012 | 9013 | 9014 | 9141 | | |
| Aldrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| a-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| b-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| g-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| d-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Chlordane | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| 4,4'-DDD | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| 4,4'-DDE | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| 4,4'-DDT | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Dieldrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Endosulfan I | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Endosulfan II | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Endosulfan sulfate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Endrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Endrin aldehyde | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Heptachlor | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Heptachlor epoxide | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PCB - 1016 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PCB - 1221 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PCB - 1232 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PCB - 1242 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PCB - 1248 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| 2,4-D | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| 2,4,5-TP (Silvex) | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |
| 2,4,5-T | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3809.12

| Parameter | E & E Laboratory No. 86- | (mg/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Aldrin | 5942 | <1.0 | <1.0 | -- |
| a-BHc | 5942 | <1.0 | <1.0 | -- |
| b-BHC | 5942 | <1.0 | <1.0 | -- |
| g-BHC | 5942 | <1.0 | <1.0 | -- |
| d-BHC | 5942 | <1.0 | <1.0 | -- |
| Chlordane | 5942 | <1.0 | <1.0 | -- |
| 4,4'-DDD | 5942 | <1.0 | <1.0 | -- |
| 4,4'-DDE | 5942 | <1.0 | <1.0 | -- |
| 4,4'-DDT | 5942 | <1.0 | <1.0 | -- |
| Dieldrin | 5942 | <1.0 | <1.0 | -- |
| Endosulfan I | 5942 | <1.0 | <1.0 | -- |
| Endosulfan II | 5942 | <1.0 | <1.0 | -- |
| Endosulfan sulfate | 5942 | <1.0 | <1.0 | -- |
| Endrin | 5942 | <1.0 | <1.0 | -- |
| Endrin aldehyde | 5942 | <1.0 | <1.0 | -- |
| Heptachlor | 5942 | <1.0 | <1.0 | -- |
| Heptachlor epoxide | 5942 | <1.0 | <1.0 | -- |
| PCB - 1016 | 5942 | <1.0 | <1.0 | -- |
| PCB - 1221 | 5942 | <1.0 | <1.0 | -- |
| PCB - 1232 | 5942 | <1.0 | <1.0 | -- |
| PCB - 1242 | 5942 | <1.0 | <1.0 | -- |
| PCB - 1248 | 59$2 | <1.0 | <1.0 | -- |
| PCB - 1254 | 5942 | <1.0 | <1.0 | -- |
| PCB - 1260 | 5942 | <1.0 | <1.0 | -- |
| Toxaphene | 5942 | <1.0 | <1.0 | -- |

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# LABORATORY REPORT

FOR

Reese Air Force Base

3809.13

| | |
|---|---|
| Job No.: U-3809 | RE: DF-2000 |
| Sample Date: 7/30/86 | P.O. No.: |
| Date Received: 7/31/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS & IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 5944 | 5945 | 5946 | 5947 | Blank | | |
| Customer No. | 9160 | 9161 | 9162 | 9163 | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 5.0 |
| Barium | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | | 100.0 |
| Cadmium | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | 1.0 |
| Chromium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 5.0 |
| Lead | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | .0 |
| Mercury | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | | 0.2 |
| Selenium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 1.0 |
| Silver | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 5.0 |
| Endrin | NR | NR | NR | NR | NR | | 0.02 |
| Lindane | NR | NR | NR | NR | NR | | 0.4 |
| Methoxychlor | NR | NR | NR | NR | NR | | 10.0 |
| Toxaphene | NR | NR | NR | NR | NR | | 0.5 |
| 2,4-D | NR | NR | NR | NR | NR | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | NR | NR | NR | | 1.0 |
| Ignitability, °F | >140 | >140 | >140 | >140 | NA | | |

NA: Not Applicable
NR: Analysis not requested

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

H-68

recycled paper

Supervising Analyst: [signature]

Date: September 9, 1986

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3809.14

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/g) | | | |
| 2,4-D | 5943 | <1.0 | 4.0 | 3.8 | 95 |
| Silvex | 5943 | <1.0 | 4.0 | 3.1 | 78 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3809.15

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 5942 | <100 | 3980 | 4460 | 113 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3809.16

| Parameter | E & E Laboratory No. 86- | (mg/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Solids | 5942 | 91 | 93 | 3.3 |
| Flashpoint | 5947 | >140 | >140 | -- |

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3809.17

| Compound | E & E Lab. No. 86- | 5940 | 5941 | 5942 | 5943 | Lab Blank |
|---|---|---|---|---|---|---|
| | Sample Identity | 9012 | 9013 | 9014 | 9141 | ug/L |
| phenol | | <1 | <1 | <1 | <1 | <10 |
| 2-chlorophenol | | <1 | <1 | <1 | <1 | <10 |
| 2-nitrophenol | | <1 | <1 | <1 | <1 | <10 |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <1 | <10 |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <1 | <10 |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <1 | <10 |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <1 | <10 |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <3 | <30 |
| 4-nitrophenol | | <1 | <1 | <1 | <1 | <10 |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <3 | <30 |
| pentachlorophenol | | <3 | <3 | <3 | <3 | <30 |

*Compound present below measurable detection limit.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3800

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 5901 | 9015 | 0165-S0-001-GS-86-9015 |
| 5902 | 9016 | 0165-S0-001-GS-86-9016 |
| 5903 | 9017 | 0165-S0-001-GS-86-9017 |
| 5904 | 9018 | 0165-S0-001-GS-86-9018 |
| 5905 | 9019 | 0165-S0-001-GS-86-9019 |
| 5906 | 9020 | 0165-S0-001-GS-86-9020 |
| 5907 | 9021 | 0165-S0-001-GS-86-9021 |
| 5908 | 9022 | 0165-S0-001-GS-86-9022 |
| 5909 | 9023 | 0165-S0-001-GS-86-9023 |
| 5910 | 9024 | 0165-S0-001-GS-86-9024 |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3800.1

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3800 | 5901 | 7/29 | 8/12 | 8/1,4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5902 | 7/29 | 8/12 | 8/1,4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5903 | 7/29 | 8/12 | 8/1,4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5904 | 7/29 | 8/12 | 8/4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5905 | 7/29 | 8/12 | 8/4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5906 | 7/29 | 8/12 | 8/4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5907 | 7/29 | 8/12 | 8/4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5908 | 7/29 | 8/12 | 8/4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5909 | 7/29 | 8/12 | 8/4 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |
| | 5910 | 7/29 | 8/12 | 8/5 | 8/5 | 8/4 | 9/3 | 8/8 | 8/5 | 7/30 | 9/8 | 7/31 | 8/5 | 7/30 | 8/12 | 8/1 | -- | -- | -- | -- |

PESI/PCB
CONFIRMATION
DATE

5909 7/31

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3800.2

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| U-3800 | 5901 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5902 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/25 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5903 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5904 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5905 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5906 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5907 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5908 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5909 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |
| | 5910 | 7/29 | -- | -- | -- | -- | 8/12 | 7/31 | 9/9 | 8/5 | -- | -- | 8/26 | 8/1 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was estracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction date.

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# LABORATORY REPORT

FOR

Reese Air Force Base

U-3800.3

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3800 | | | RE: DF-2000 | | | |
| Sample Date: 7/29/86 | | | P.O. No.: | | | |
| Date Received: 7/30/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 5901 | 5902 | 5903 | 5904 | 5905 | |
| Customer No. | 9015 | 9016 | 9017 | 9018 | 9019 | |
| Sample Identity | | | | | | |
| | Results in: mg/kg* unless noted | | | | | |
| Oil and Grease<br>Solids, % | 470<br>88 | <100<br>88 | <100<br>92 | <100<br>86 | <100<br>88 | |

*As received

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: September 18, 1986



recycled paper

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# LABORATORY REPORT

FOR

Reese Air Force Base

U-3800.4

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3800 | | | RE: DF-2000 | | | |
| Sample Date: 7/29/86 | | | P.O. No.: | | | |
| Date Received: 7/30/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 5906 | 5907 | 5908 | 5909 | 5910 | |
| Customer No. | 9020 | 9021 | 9022 | 9023 | 9024 | |
| Sample Identity | | | | | | |
| | Results in: mg/kg* unless noted | | | | | |
| Oil and Grease<br>Solids, % | 100<br>87 | <100<br>76 | <100<br>92 | <100<br>79 | <100<br>83 | |

*As received

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Sally Hahn/KS

Date: September 10, 1986



recycled paper

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY
POLLUTANT PESTICIDES/PCBs AND HERBICIDES BY GC
(all results in ug/g as received)

U-3800.5

| | E & E Lab. No. 86- | 5901 | 5902 | 5903 | 5904 | 5905 | 5906 | 5907 |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9015 | 9016 | 9017 | 9018 | 9019 | 9020 | 9021 |
| Aldrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| a-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| b-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| g-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| d-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Chlordane | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,4'-DDD | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,4'-DDE | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,4'-DDT | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dieldrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan I | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan II | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan sulfate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endrin aldehyde | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Heptachlor | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Heptachlor epoxide | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1016 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1221 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1232 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1242 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1248 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-D | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4,5-TP (Silvex) | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4,5-T | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY
POLLUTANT PESTICIDES/$PCB_s$ AND HERBICIDES BY GC
(all results in ug/g as received)

U-3800.6

| | E & E Lab. No. 86- | 5908 | 5909+ | 5910 | BLANK | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9022 | 9023 | 9024 | 7/30/86 | | | |
| Aldrin | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| a-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| b-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| g-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| d-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Chlordane | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 4,4'-DDD | | <1.0 | <1.0* | <1.0 | <1.0 | | | |
| 4,4'-DDE | | <1.0 | <1.0* | <1.0 | <1.0 | | | |
| 4,4'-DDT | | <1.0 | 2.5 | <1.0 | <1.0 | | | |
| Dieldrin | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endosulfan I | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endosulfan II | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endosulfan sulfate | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endrin | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endrin aldehyde | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Heptachlor | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Heptachlor epoxide | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1016 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1221 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1232 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1242 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1248 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 2,4-D | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 2,4,5-TP(Silvex) | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 2,4,5-T | | <1.0 | <1.0 | <1.0 | <1.0 | | | |

*Also present but less than CRDL
+Sample confirmed - results positive

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3800.7

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Aldrin | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| a-BHC | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| b-BHC | 5910 | <1.0 | 2.0 | 1.8 | 90 |
| g-BHC | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| d-BHC | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| 4,4'-DDD | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| 4,4'-DDE | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| 4,4'-DDT | 5910 | <1.0 | 2.0 | 1.4 | 70 |
| Dieldrin | 5910 | <1.0 | 2.0 | 1.6 | 80 |
| Endosulfan I | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| Endosulfan II | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| Endosulfan sulfate | 5910 | <1.0 | 2.0 | 1.6 | 80 |
| Endrin | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| Endrin aldehyde | 5910 | <1.0 | 2.0 | 1.7 | 85 |
| Heptachlor | 5910 | <1.0 | 2.0 | 1.9 | 95 |
| Heptachlor epoxide | 5910 | <1.0 | 2.0 | 1.7 | 85 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in mg/kg as received)

U-3800.8

| | E & E Lab. No. 86- | 5901 | 5902 | 5903 | 5904 | 5905 | 5906 | 5907 |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9015 | 9016 | 9017 | 9018 | 9019 | 9020 | 9021 |
| Naled | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Phorate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Disulfoton | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Chlorpyrifos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dimethoate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Malathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Mevinphos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Parathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Methyl parathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Diazinon | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Methyl azinphos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in mg/kg as received)

U-3800.9

| | E & E Lab. No. 86- | 5908 | 5909 | 5910 | BLANK | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9022 | 9023 | 9024 | 7/30/86 | | | |
| Naled | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Phorate | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Disulfoton | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Chlorpyrifos | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Dimethoate | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Malathion | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Mevinphos | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Parathion | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Methyl parathion | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Diazinon | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Methyl azinphos | | <1.0 | <1.0 | <1.0 | <1.0 | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3800.10

| Compound | E & E Lab. No. 86- | BLANK | 5901 | 5902 | 5903 | 5904 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/1/86 | 9015 | 9016 | 9017 | 9018 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3800.11

| Compound | E & E Lab. No. 86- | 5905 | 5906 | 5907 | 5908 | 5909 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9019 | 9020 | 9021 | 9022 | 9023 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3800.12

| Compound | E & E Lab. No. 86- | 5910 | BLANK | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9024 | 8/4/86 | | | |
| chlorobenzene | | <250 | <250 | | | |
| 1,2-dichlorobenzene | | <500 | <500 | | | |
| 1,3-dichlorobenzene | | <500 | <500 | | | |
| 1,4-dichlorobenzene | | <500 | <500 | | | |
| benzene | | <250 | <250 | | | |
| total xylenes | | <500 | <500 | | | |
| toluene | | <250 | <250 | | | |
| ethylbenzene | | <250 | <250 | | | |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3800.13

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| 1,2-dichlorobenzene | 5910 | <500 | 1250 | 1069 | 86 |
| 1,3-dichlorobenzene | 5910 | <500 | 1250 | 1234 | 99 |
| 1,4-dichlorobenzene | 5910 | <500 | 1250 | 1088 | 87 |
| toluene | 5910 | <250 | 1250 | 1198 | 96 |
| ethyl benzene | 5910 | <250 | 1250 | 1149 | 92 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3800.14

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/g) | | | |
| 2,4-D | 5910 | <1.0 | 4.0 | 3.4 | 85 |
| Silvex | 5910 | <1.0 | 4.0 | 3.2 | 80 |

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3800.15

| Compound | E & E Lab. No. 86- | BLANK | 5901 | 5902 | 5903 | 5904 | 5905 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/4/86 | 9015 | 9016 | 9017 | 9018 | 9019 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3800.16

| Compound | E & E Lab. No. 86- | 5906 | 5907 | 5908 | 5909 | 5910 | BLANK |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9020 | 9021 | 9022 | 9023 | 9024 | 8/5/86 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3800.17

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| carbon tetrachloride | 5910 | <250 | 1250 | 973.1 | 77.8 |
| 1,2-dichloroethane | 5910 | <100 | 1250 | 1073 | 85.8 |
| 1,1,1-trichloroethane | 5910 | <250 | 1250 | 982.5 | 78.6 |
| 1,1-dichloroethane | 5910 | <100 | 1250 | 1094 | 87.5 |
| chloroethane | 5910 | <500 | 1250 | 1334 | 107 |
| chloroform | 5910 | <250 | 1250 | 1126 | 90.2 |
| trans-1,2-dichloroethene | 5910 | <100 | 1250 | 1061 | 84.8 |
| methylene chloride | 5910 | <50 | 1250 | 961.8 | 76.9 |
| chloromethane | 5910 | <500 | 1250 | 1245 | 99.6 |
| bromomethane | 5910 | <500 | 1250 | 1188 | 95.0 |
| bromoform | 5910 | <1000 | 1250 | 1232 | 98.6 |
| bromodichloromethane | 5910 | <250 | 1250 | 1042 | 83.4 |
| trichloroethene | 5910 | <250 | 1250 | 1068 | 85.4 |

ECOLOGY AND ENVIRONMENTS, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3800.18

| Compound | E & E Lab. No. 86- | 5901 | 5902 | 5903 | 5904 | 5905 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9015 | 9016 | 9017 | 9018 | 9019 |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <1 | <1 |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <1 | <1 |
| hexachloroethane | | <1 | <1 | <1 | <1 | <1 |
| nitrobenzene | | <1 | <1 | <1 | <1 | <1 |
| isophorone | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <1 | <1 |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| naphthalene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobutadiene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <1 | <1 |
| 2-chloronaphthalene | | <1 | <1 | <1 | <1 | <1 |
| dimethyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| acenaphthylene | | <1 | <1 | <1 | <1 | <1 |
| fluorene | | <1 | <1 | <1 | <1 | <1 |
| acenaphthene | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| diethylphthalate | | <1 | <1 | <1 | <1 | <1 |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <1 | <1 |
| 4-bromopheny' ohenyl ether | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| phenanthrene | | <1 | <1 | <1 | <1 | <1 |
| anthracene | | <1 | <1 | <1 | <1 | <1 |
| di-n-butyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzidine | | <5 | <5 | <5 | <5 | <5 |
| pyrene | | <1 | <1 | <1 | <1 | <1 |
| butyl benzyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <3 | <3 |
| benzo(a)anthracene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | <1 | <1 | <1 |
| chrysene | | <1 | <1 | <1 | <1 | <1 |
| di-n-octyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| benzo(b)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(a)pyrene | | <1 | <1 | <1 | <1 | <1 |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <1 | <1 |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <1 | <1 |
| benzo(ghi)perylene | | <1 | <1 | <1 | <1 | <1 |

*Compound present below measurable detection limit

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3800.19

| Compound | E & E Lab. No. 86- | 5901 | 5902 | 5903 | 5904 | 5905 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9015 | 9016 | 9017 | 9018 | 9019 |
| phenol | | <1 | <1 | <1 | <1 | <1 |
| 2-chlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <3 | <3 |
| 4-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <3 | <3 |
| pentachlorophenol | | <3 | <3 | <3 | <3 | <3 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3800.20

| Compound | E & E Lab. No. 86- | 5906 | 5907 | 5908 | 5909 | 5910 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9020 | 9021 | 9022 | 9023 | 9024 |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <1 | <1 |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <1 | <1 |
| hexachloroethane | | <1 | <1 | <1 | <1 | <1 |
| nitrobenzene | | <1 | <1 | <1 | <1 | <1 |
| isophorone | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <1 | <1 |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| naphthalene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobutadiene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <1 | <1 |
| 2-chloronaphthalene | | <1 | <1 | <1 | <1 | <1 |
| dimethyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| acenaphthylene | | <1 | <1 | <1 | <1 | <1 |
| fluorene | | <1 | <1 | <1 | <1 | <1 |
| acenaphthene | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| diethylphthalate | | <1 | <1 | <1 | <1 | <1 |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <1 | <1 |
| 4-bromophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| phenanthrene | | <1 | <1 | <1 | <1 | <1 |
| anthracene | | <1 | <1 | <1 | <1 | <1 |
| di-n-butyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzidine | | <5 | <5 | <5 | <5 | <5 |
| pyrene | | <1 | <1 | <1 | <1 | <1 |
| butyl benzyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <3 | <3 |
| benzo(a)anthracene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | <1 | <1 | <1 |
| chrysene | | <1 | <1 | <1 | <1 | <1 |
| di-n-octyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| benzo(b)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(a)pyrene | | <1 | <1 | <1 | <1 | <1 |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <1 | <1 |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <1 | <1 |
| benzo(ghi)perylene | | <1 | <1 | <1 | <1 | <1 |

*Compound present below measurable detection limit

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF BLANK ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3800.21

| Compound | E & E Lab. No. 86- | METHOD BLANK | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | | | | | |
| bis(2-chloroethyl)ether | | <10 | | | | |
| 1,3-dichlorobenzene | | <10 | | | | |
| 1,4-dichlorobenzene | | <10 | | | | |
| 1,2-dichlorobenzene | | <10 | | | | |
| bis(2-chloroisopropyl)ether | | <10 | | | | |
| N-nitrosodipropylamine | | <10 | | | | |
| hexachloroethane | | <10 | | | | |
| nitrobenzene | | <10 | | | | |
| isophorone | | <10 | | | | |
| bis(2-chloroethoxy)methane | | <10 | | | | |
| 1,2,4-trichlorobenzene | | <10 | | | | |
| naphthalene | | <10 | | | | |
| hexachlorobutadiene | | <10 | | | | |
| hexachlorocyclopentadiene | | <10 | | | | |
| 2-chloronaphthalene | | <10 | | | | |
| dimethyl phthalate | | <10 | | | | |
| acenaphthylene | | <10 | | | | |
| fluorene | | <10 | | | | |
| acenaphthene | | <10 | | | | |
| 2,4-dinitrotoluene | | <10 | | | | |
| 2,6-dinitrotoluene | | <10 | | | | |
| diethylphthalate | | <10 | | | | |
| 4-chlorophenyl phenyl ether | | <10 | | | | |
| N-nitrosodiphenylamine | | <10 | | | | |
| 4-bromophenyl phenyl ether | | <10 | | | | |
| hexachlorobenzene | | <10 | | | | |
| phenanthrene | | <10 | | | | |
| anthracene | | <10 | | | | |
| di-n-butyl phthalate | | <10 | | | | |
| fluoranthene | | <10 | | | | |
| benzidine | | <50 | | | | |
| pyrene | | <10 | | | | |
| butyl benzyl phthalate | | <10 | | | | |
| 3,3'-dichlorobenzidine | | <30 | | | | |
| benzo(a)anthracene | | <10 | | | | |
| bis(2-ethylhexyl)phthalate | | <10 | | | | |
| chrysene | | <10 | | | | |
| di-n-octyl phthalate | | <10 | | | | |
| benzo(b)fluoranthene | | <10 | | | | |
| benzo(k)fluoranthene | | <10 | | | | |
| benzo(a)pyrene | | <10 | | | | |
| indeno(1,2,3-cd)pyrene | | <10 | | | | |
| dibenzo(a,h)anthracene | | <10 | | | | |
| benzo(ghi)perylene | | <10 | | | | |

*Compound present below measurable detection limit

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF BLANK ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3800.22

| Compound | E & E Lab. No. 86- | METHOD BLANK | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | | | | | |
| phenol | | <10 | | | | |
| 2-chlorophenol | | <10 | | | | |
| 2-nitrophenol | | <10 | | | | |
| 2,4-dimethylphenol | | <10 | | | | |
| 2,4-dichlorophenol | | <10 | | | | |
| 4-chloro-3-methylphenol | | <10 | | | | |
| 2,4,6-trichlorophenol | | <10 | | | | |
| 2,4-dinitrophenol | | <30 | | | | |
| 4-nitrophenol | | <10 | | | | |
| 4,6-dinitro-2-methylphenol | | <30 | | | | |
| pentachlorophenol | | <30 | | | | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

U-3800.23

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| Nitrobenzene-D5 | 5901 | 3.3 | 1.6 | 48.5 |
| | 5902 | 3.3 | 2.6 | 78.8 |
| | 5903 | 3.3 | 2.2 | 66.7 |
| | 5904 | 3.3 | 1.5 | 45.5 |
| | 5905 | 3.3 | 1.9 | 57.8 |
| | 5906 | 3.3 | 2.1 | 63.6 |
| | 5907 | 3.3 | 2.0 | 60.6 |
| | 5908 | 3.3 | 1.6 | 48.5 |
| | 5909 | 3.3 | 1.9 | 57.8 |
| | 5910 | 3.3 | 2.0 | 60.6 |
| 2-fluorobiphenyl | 5901 | 3.3 | 2.5 | 75.8 |
| | 5902 | 3.3 | 3.0 | 90.9 |
| | 5903 | 3.3 | 2.9 | 87.9 |
| | 5904 | 3.3 | 2.4 | 72.7 |
| | 5905 | 3.3 | 2.7 | 81.8 |
| | 5906 | 3.3 | 2.9 | 87.9 |
| | 5907 | 3.3 | 2.9 | 87.9 |
| | 5908 | 3.3 | 2.3 | 69.7 |
| | 5909 | 3.3 | 3.0 | 90.9 |
| | 5910 | 3.3 | 3.0 | 90.9 |
| terphenyl-D14 | 5901 | 3.3 | 2.2 | 66.7 |
| | 5902 | 3.3 | 3.1 | 93.9 |
| | 5903 | 3.3 | 2.8 | 84.8 |
| | 5904 | 3.3 | 2.3 | 69.7 |
| | 5905 | 3.3 | 2.5 | 75.6 |
| | 5906 | 3.3 | 2.6 | 78.8 |
| | 5907 | 3.3 | 2.8 | 84.8 |
| | 5908 | 3.3 | 2.4 | 72.7 |
| | 5909 | 3.3 | 2.4 | 72.7 |
| | 5910 | 3.3 | 2.1 | 63.6 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3800.24

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| phenol-D5 | 5901 | 6.6 | 2.1 | 31.8 |
| | 5902 | 6.6 | 4.7 | 71.2 |
| | 5903 | 6.6 | 3.2 | 48.5 |
| | 5904 | 6.6 | 2.1 | 31.8 |
| | 5905 | 6.6 | 2.4 | 36.4 |
| | 5906 | 6.6 | 3.3 | 50.0 |
| | 5907 | 6.6 | 3.2 | 48.5 |
| | 5908 | 6.6 | 2.5 | 37.9 |
| | 5909 | 6.6 | 2.3 | 34.8 |
| | 5910 | 6.6 | 2.1 | 31.8 |
| 2-fluorophenol | 5901 | 6.6 | 1.6 | 24.2 |
| | 5902 | 6.6 | 5.8 | 87.9 |
| | 5903 | 6.6 | 2.2 | 33.3 |
| | 5904 | 6.6 | 1.6 | 24.2 |
| | 5905 | 6.6 | 1.8 | 27.3 |
| | 5906 | 6.6 | 2.7 | 40.9 |
| | 5907 | 6.6 | 2.2 | 33.3 |
| | 5908 | 6.6 | 2.0 | 30.3 |
| | 5909 | 6.6 | 1.5 | 22.7 |
| | 5910 | 6.6 | 1.4 | 21.2 |
| 2,4,6-tribromophenol | 5901 | 6.6 | 1.9 | 28.8 |
| | 5902 | 6.6 | 2.0 | 30.3 |
| | 5903 | 6.6 | 3.3 | 50.0 |
| | 5904 | 6.6 | 2.2 | 33.3 |
| | 5905 | 6.6 | 3.2 | 48.5 |
| | 5906 | 6.6 | 2.9 | 43.9 |
| | 5907 | 6.6 | 3.0 | 45.5 |
| | 5908 | 6.6 | 2.9 | 43.9 |
| | 5909 | 6.6 | 1.6 | 24.2 |
| | 5910 | 6.6 | <1 | <15 |

With the exception of poor 2-fluorophenol and 2,4,6-tribromophenol recoveries in sample 5910, these recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3800.25

| Compound | E & E Lab. No. 86-5905 | mg/kg | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| bis(2-chloroethyl)ether | | <1 | <1 | -- |
| 1,3-dichlorobenzene | | <1 | <1 | -- |
| 1,4-dichlorobenzene | | <1 | <1 | -- |
| 1,2-dichlorobenzene | | <1 | <1 | -- |
| bis(2-chloroisopropyl)ether | | <1 | <1 | -- |
| N-nitrosodipropylamine | | <1 | <1 | -- |
| hexachloroethane | | <1 | <1 | -- |
| nitrobenzene | | <1 | <1 | -- |
| isophorone | | <1 | <1 | -- |
| bis(2-chloroethoxy)methane | | <1 | <1 | -- |
| 1,2,4-trichlorobenzene | | <1 | <1 | -- |
| naphthalene | | <1 | <1 | -- |
| hexachlorobutadiene | | <1 | <1 | -- |
| hexachlorocyclopentadiene | | <1 | <1 | -- |
| 2-chloronaphthalene | | <1 | <1 | -- |
| dimethyl phthalate | | <1 | <1 | -- |
| acenaphthylene | | <1 | <1 | -- |
| fluorene | | <1 | <1 | -- |
| acenaphthene | | <1 | <1 | -- |
| 2,4-dinitrotoluene | | <1 | <1 | -- |
| 2,6-dinitrotoluene | | <1 | <1 | -- |
| diethylphthalate | | <1 | <1 | -- |
| 4-chlorophenyl phenyl ether | | <1 | <1 | -- |
| N-nitrosodiphenylamine | | <1 | <1 | -- |
| 4-bromophenyl phenyl ether | | <1 | <1 | -- |
| hexachlorobenzene | | <1 | <1 | -- |
| phenanthrene | | <1 | <1 | -- |
| anthracene | | <1 | <1 | -- |
| di-n-butyl phthalate | | <1 | <1 | -- |
| fluoranthene | | <1 | <1 | -- |
| benzidine | | <5 | <5 | -- |
| pyrene | | <1 | <1 | -- |
| butyl benzyl phthalate | | <1 | <1 | -- |
| 3,3'-dichlorobenzidine | | <3 | <3 | -- |
| benzo(a)anthracene | | <1 | <1 | -- |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | -- |
| chrysene | | <1 | <1 | -- |
| di-n-octyl phthalate | | <1 | <1 | -- |
| benzo(b)fluoranthene | | <1 | <1 | -- |
| benzo(k)fluoranthene | | <1 | <1 | -- |
| benzo(a)pyrene | | <1 | <1 | -- |
| indeno(1,2,3-c,d)pyrene | | <1 | <1 | -- |
| dibenzo(a,h)anthracene | | <1 | <1 | -- |
| benzo(g,h,i)perylene | | <1 | <1 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3800.26

| Compound | E & E Lab. No. 86-5905 | mg/kg | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| phenol | | <1 | <1 | -- |
| 2-chlorophenol | | <1 | <1 | -- |
| 2-nitrophenol | | <1 | <1 | -- |
| 2,4-dimethylphenol | | <1 | <1 | -- |
| 2,4-dichlorophenol | | <1 | <1 | -- |
| 4-chloro-3-methylphenol | | <1 | <1 | -- |
| 2,4,6-trichlorophenol | | <1 | <1 | -- |
| 2,4-dinitrophenol | | <3 | <3 | -- |
| 4-nitrophenol | | <1 | <1 | -- |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | -- |
| pentachlorophenol | | <3 | <3 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3800.27

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Diazinon | 5910 | <1.0 | 21.1 | 18.5 | 88 |
| Oil and Grease | 5903 | <100 | 4630 | 5250 | 113 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3800.28

| Parameter | E & E Laboratory No. 86- | (%) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Solids | 5902 | 88 | 89 | 1.1 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3800.29

| Compound | E & E Lab. No. 86- | 5906 | 5907 | 5908 | 5909 | 5910 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9020 | 9021 | 9022 | 9023 | 9024 |
| phenol | | <1 | <1 | <1 | <1 | <1 |
| 2-chlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <3 | <3 |
| 4-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <3 | <3 |
| pentachlorophenol | | <3 | <3 | <3 | <3 | <3 |

*Compound present below measurable detection limit.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3880

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6428 | 9007 | 0165-SO-001-GS-86-9007 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3880.1

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(14/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3880 | 6428 | 8/7 | -- | -- | -- | -- | 8/21 | 8/12 | 9/21 | 8/15 | -- | -- | 9/4 | 9/5 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3880.2

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3880 | 6428 | 8/7 | 8/21 | 8/11,12 | 8/14 | 8/11 | 9/10 | 8/13 | 8/14 | 8/13 | 9/22 | 8/18 | 8/14 | 8/13 | 8/21 | 8/14 | -- | -- | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

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International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3880.3

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3880 | | | RE: DF-2000 | | | |
| Sample Date: 8/7/86 | | | P.O. No.: | | | |
| Date Received: 8/8/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6428 | | | | | |
| Customer No. | 9007 | | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg, as received unless noted | | | | | |
| Oil and Grease | <100 | | | | | |
| Solids, % | 62 | | | | | |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn / KAB

Date: September 16, 1986



recycled paper

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/g, as received)

U-3880.4

| | E & E Lab. No. 86- | 6428 | Blank | | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9007 | 8/13/86 | | | | | |
| Naled | | <1.0 | <1.0 | | | | | |
| Phorate | | <1.0 | <1.0 | | | | | |
| Disulfoton | | <1.0 | <1.0 | | | | | |
| Chlorpyrifos | | <1.0 | <1.0 | | | | | |
| Dimethoate | | <1.0 | <1.0 | | | | | |
| Malathion | | <1.0 | <1.0 | | | | | |
| Mevinphos | | <1.0 | <1.0 | | | | | |
| Parathion | | <1.0 | <1.0 | | | | | |
| Methyl parathion | | <1.0 | <1.0 | | | | | |
| Diazinon | | <1.0 | <1.0 | | | | | |
| Methyl azinphos | | <1.0 | <1.0 | | | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3880.5

| Compound | E & E Lab. No. 86- | Blank | 6428 | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/11/86 | 9007 | | | |
| chlorobenzene | | <250 | <250 | | | |
| 1,2-dichlorobenzene | | <500 | <500 | | | |
| 1,3-dichlorobenzene | | <500 | <500 | | | |
| 1,4-dichlorobenzene | | <500 | <500 | | | |
| benzene | | <250 | <250 | | | |
| total xylenes | | <500 | <500 | | | |
| toluene | | <250 | <250 | | | |
| ethylbenzene | | <250 | <250 | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3880.6

| Compound | E & E Lab. No. 86- | Blank | 6428 | | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/12/86 | 9007 | | | | |
| carbon tetrachloride | | <250 | <250 | | | | |
| 1,2-dichloroethane | | <100 | <100 | | | | |
| 1,1,1-trichloroethane | | <250 | <250 | | | | |
| 1,1-dichloroethane | | <100 | <100 | | | | |
| 1,1,2-trichloroethane | | <500 | <500 | | | | |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | | | | |
| chloroethane | | <500 | <500 | | | | |
| 2-chloroethylvinyl ether | | <5000 | <5000 | | | | |
| chloroform | | <250 | <250 | | | | |
| 1,1-dichloroethene | | <100 | <100 | | | | |
| trans-1,2-dichloroethene | | <100 | <100 | | | | |
| 1,2-dichloropropane | | <1000 | <1000 | | | | |
| trans-1,3-dichloropropene | | <1000 | <1000 | | | | |
| cis-1,3-dichloropropene | | <1000 | <1000 | | | | |
| methylene chloride | | <50 | <50 | | | | |
| chloromethane | | <500 | <500 | | | | |
| bromomethane | | <500 | <500 | | | | |
| bromoform | | <1000 | <1000 | | | | |
| bromodichloromethane | | <250 | <250 | | | | |
| fluorotrichloromethane | | <500 | <500 | | | | |
| dichlorodifluoromethane | | <500 | <500 | | | | |
| chlorodibromomethane | | <250 | <250 | | | | |
| tetrachloroethene | | <250 | <250 | | | | |
| trichloroethene | | <250 | <250 | | | | |
| vinyl chloride | | <500 | <500 | | | | |

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PRIORITY POLLUTANT PESTICIDES, PCBs AND HERBICIDES

(all results in mg/kg, as received)

U-3880.7

| | E & E Lab. No. 86- | 6428 | Blank | | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9007 | 8/13/86 | | | | | |
| Aldrin | | <1.0 | <1.0 | | | | | |
| a-BHC | | <1.0 | <1.0 | | | | | |
| b-BHC | | <1.0 | <1.0 | | | | | |
| g-BHC | | <1.0 | <1.0 | | | | | |
| d-BHC | | <1.0 | <1.0 | | | | | |
| Chlordane | | <1.0 | <1.0 | | | | | |
| 4,4'-DDD | | <1.0 | <1.0 | | | | | |
| 4,4'-DDE | | <1.0 | <1.0 | | | | | |
| 4,4'-DDT | | <1.0 | <1.0 | | | | | |
| Dieldrin | | <1.0 | <1.0 | | | | | |
| Endosulfan I | | <1.0 | <1.0 | | | | | |
| Endosulfan II | | <1.0 | <1.0 | | | | | |
| Endosulfan sulfate | | <1.0 | <1.0 | | | | | |
| Endrin | | <1.0 | <1.0 | | | | | |
| Endrin aldehyde | | <1.0 | <1.0 | | | | | |
| Heptachlor | | <1.0 | <1.0 | | | | | |
| Heptachlor epoxide | | <1.0 | <1.0 | | | | | |
| PCB - 1016 | | <1.0 | <1.0 | | | | | |
| PCB - 1221 | | <1.0 | <1.0 | | | | | |
| PCB - 1232 | | <1.0 | <1.0 | | | | | |
| PCB - 1242 | | <1.0 | <1.0 | | | | | |
| PCB - 1248 | | <1.0 | <1.0 | | | | | |
| PCB - 1254 | | <1.0 | <1.0 | | | | | |
| PCB - 1260 | | <1.0 | <1.0 | | | | | |
| Toxaphene | | <1.0 | <1.0 | | | | | |
| 2,4-D | | <1.0 | <1.0 | | | | | |
| 2,4,5-TP (Silvex) | | <1.0 | <1.0 | | | | | |
| 2,4,5-T | | <1.0 | <1.0 | | | | | |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3880.8

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/g) | | | |
| 2,4-D | 6428 | <1.0 | 4.0 | 3.7 | 93 |
| Silvex | 6428 | <1.0 | 4.0 | 2.9 | 73 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3880.9

| Compound | E & E Lab. No. 86- | 6428 | Method Blank | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9007 | ug/L | | | |
| bis(2-chloroethyl)ether | | <1 | <10 | | | |
| 1,3-dichlorobenzene | | <1 | <10 | | | |
| 1,4-dichlorobenzene | | <1 | <10 | | | |
| 1,2-dichlorobenzene | | <1 | <10 | | | |
| bis(2-chloroisopropyl)ether | | <1 | <10 | | | |
| N-nitrosodipropylamine | | <1 | <10 | | | |
| hexachloroethane | | <1 | <10 | | | |
| nitrobenzene | | <1 | <10 | | | |
| isophorone | | <1 | <10 | | | |
| bis(2-chloroethoxy)methane | | <1 | <10 | | | |
| 1,2,4-trichlorobenzene | | <1 | <10 | | | |
| naphthalene | | <1 | <10 | | | |
| hexachlorobutadiene | | <1 | <10 | | | |
| hexachlorocyclopentadiene | | <1 | <10 | | | |
| 2-chloronaphthalene | | <1 | <10 | | | |
| dimethyl phthalate | | <1 | <10 | | | |
| acenaphthylene | | <1 | <10 | | | |
| fluorene | | <1 | <10 | | | |
| acenaphthene | | <1 | <10 | | | |
| 2,4-dinitrotoluene | | <1 | <10 | | | |
| 2,6-dinitrotoluene | | <1 | <10 | | | |
| diethylphthalate | | <1 | <10 | | | |
| 4-chlorophenyl phenyl ether | | <1 | <10 | | | |
| N-nitrosodiphenylamine | | <1 | <10 | | | |
| 4-bromophenyl phenyl ether | | <1 | <10 | | | |
| hexachlorobenzene | | <1 | <10 | | | |
| phenanthrene | | <1 | <10 | | | |
| anthracene | | <1 | <10 | | | |
| di-n-butyl phthalate | | <1 | <10 | | | |
| fluoranthene | | <1 | <10 | | | |
| benzidine | | <5 | <50 | | | |
| pyrene | | <1 | <10 | | | |
| butyl benzyl phthalate | | <1 | <10 | | | |
| 3,3'-dichlorobenzidine | | <3 | <30 | | | |
| benzo(a)anthracene | | <1 | <10 | | | |
| bis(2-ethylhexyl)phthalate | | <1 | <10 | | | |
| chrysene | | <1 | <10 | | | |
| di-n-octyl phthalate | | <1 | <10 | | | |
| benzo(b)fluoranthene | | <1 | <10 | | | |
| benzo(k)fluoranthene | | <1 | <10 | | | |
| benzo(a)pyrene | | <1 | <10 | | | |
| indeno(1,2,3-cd)pyrene | | <1 | <10 | | | |
| dibenzo(a,h)anthracene | | <1 | <10 | | | |
| benzo(ghi)perylene | | <1 | <10 | | | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3880.10

| Compound | E & E Lab. No. 86- | 6428 | Method Blank | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9007 | ug/L | | | |
| phenol | | <1 | <10 | | | |
| 2-chlorophenol | | <1 | <10 | | | |
| 2-nitrophenol | | <1 | <10 | | | |
| 2,4-dimethylphenol | | <1 | <10 | | | |
| 2,4-dichlorophenol | | <1 | <10 | | | |
| 4-chloro-3-methylphenol | | <1 | <10 | | | |
| 2,4,6-trichlorophenol | | <1 | <10 | | | |
| 2,4-dinitrophenol | | <3 | <30 | | | |
| 4-nitrophenol | | <1 | <10 | | | |
| 4,6-dinitro-2-methylphenol | | <3 | <30 | | | |
| pentachlorophenol | | <3 | <30 | | | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3880.11

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| nitrobenzene-D5 | 6428 | 3.3 | 2.2 | 66.7 |
| 2-fluorobiphenyl | 6428 | 3.3 | 3.6 | 109 |
| terphenyl-D14 | 6428 | 3.3 | 2.5 | 75.8 |
| phenol-D5 | 6428 | 6.6 | 2.9 | 43.9 |
| 2-fluorophenol | 6428 | 6.6 | 1.7 | 25.8 |
| 2,4,6-tribromophenol | 6428 | 6.6 | 3.5 | 53.0 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3880.12

| Parameter | E & E Laboratory No. 86- | (%) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Solids | 6489* | 70 | 70 | 0 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3880.13

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 7023* | 160 | 4530 | 5440 | 116 |

*This represent 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3818

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6004 | 9033 | 0165-SO-002-GS-86-9033 |
| 6005 | 9034 | 0165-SO-002-GS-86-9034 |
| 6006 | 9035 | 0165-SO-002-GS-86-9035 |
| 6007 | 9036 | 0165-SO-002-GS-86-9036 |
| 6008 | 9037 | 0165-SO-002-GS-86-9037 |
| 6009 | 9038 | 0165-SO-002-GS-86-9038 |
| 6010 | 9039 | 0165-SO-002-GS-86-9039 |
| 6011 | 9040 | 0165-SO-002-GS-86-9040 |
| 6012 | 9164 | 0165-SO-002-GS-86-9164 |
| 6013 | 9165 | 0165-SO-002-GS-86-9165 |
| 6014 | 9166 | 0165-SO-002-GS-86-9166 |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3818.15

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3818 | 6004 | 7/31 | 8/14 | 8/5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/7 | 8/5 | 9/4 | 8/11 |
| | 6005 | 7/31 | 8/14 | 8/5,6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/7 | 8/5 | 9/4 | 8/11 |
| | 6006 | 7/31 | 8/14 | 8/5,6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/7 | 8/5 | 9/4 | 8/11 |
| | 6007 | 7/31 | 8/14 | 8/5,6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/7 | 8/5 | 9/4 | 8/11 |
| | 6008 | 7/31 | 8/14 | 8/5,6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/7 | 8/5 | 9/4 | 8/12 |
| | 6009 | 7/31 | 8/14 | 8/5,6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/7 | 8/5 | 9/4 | 8/12 |
| | 6010 | 7/31 | 8/14 | 8/5,6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/7 | 8/5 | 9/4 | 8/12 |
| | 6011 | 7/31 | 8/14 | 8/5,6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/7 | 8/5 | 9/4 | 8/12 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3818.16

| Job | Sample Number | Sample Date | PAH (7/S + 30) Extraction Dead | PAH (7/S + 30) Extraction Extr | PAH (7/S + 30) Analysis Dead | PAH (7/S + 30) Analysis Anal | BNA(7/E + 40) Extraction Dead | BNA(7/E + 40) Extraction Extr | BNA(7/E + 40) Analysis Dead | BNA(7/E + 40) Analysis Anal | TDS (7) Dead | TDS (7) Anal | O&G(28) Dead | O&G(28) Anal | Pet. HC(28) Dead | Pet. HC(28) Anal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-3818 | 6004 | 7/31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/22 | 8/4 | -- | -- |
| | 6005 | 7/31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/22 | 8/4 | -- | -- |
| | 6006 | 7/31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/22 | 8/4 | -- | -- |
| | 6007 | 7/31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/22 | 8/4 | -- | -- |
| | 6008 | 7/31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/22 | 8/4 | -- | -- |
| | 6009 | 7/31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/22 | 8/4 | -- | -- |
| | 6010 | 7/31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/22 | 8/4 | -- | -- |
| | 6011 | 7/31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/22 | 8/4 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3818.1

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3818 | | | RE: DF-2000 | | | |
| Sample Date: 7/31/86 | | | P.O. No.: | | | |
| Date Received: 8/1/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6004 | 6005 | 6006 | 6007 | 6008 | |
| Customer No. | 9033 | 9034 | 9035 | 9036 | 9037 | |
| Sample Identity | | | | | | |
| | Results in: mg/kg unless noted | | | | | |
| Oil and Grease | 182 | <100 | 152 | <100 | <100 | |
| Solids, % | 90 | 90 | 94 | 82 | 87 | |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: August 22, 1986



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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3818.2

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3818 | | | RE: DF-2000 | | | |
| Sample Date: 7/31/86 | | | P.O. No.: | | | |
| Date Received: 8/1/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6009 | 6010 | 6011 | | | |
| Customer No. | 9038 | 9039 | 9040 | | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg unless noted | | | | | |
| Oil and Grease | <100 | <100 | <100 | | | |
| Solids, % | 86 | 80 | 90 | | | |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Mary Stahr/KB

Date: August 22, 1986



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ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3818.3

| Compound | E & E Lab. No. 86- | Blank | 6004 | 6005 | 6006 | 6007 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/5/86 | 9033 | 9034 | 9035 | 9036 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3818.4

| Compound | E & E Lab. No. 86- | 6008 | 6009 | 6010 | 6011 | Blank |
|---|---|---|---|---|---|---|
| | Sample Identity | 9037 | 9038 | 9039 | 9040 | 8/5/86 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3818.5

| Parameter | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | 6011 | <250 | <250 | -- |
| 1,2-dichlorobenzene | 6011 | <500 | <500 | -- |
| 1,3-dichlorobenzene | 6011 | <500 | <500 | -- |
| 1,4-dichlorobenzene | 6011 | <500 | <500 | -- |
| benzene | 6011 | <250 | <250 | -- |
| total xylenes | 6011 | <500 | <500 | -- |
| toluene | 6011 | <250 | <250 | -- |
| ethyl benzene | 6011 | <250 | <250 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3818.6

| Compound | E & E Lab. No. 86- | Blank | Blank | Blank | Blank | 6004 | 6005 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/5/86 | 8/5/86 | 8/5/86 | 8/6/86 | 9033 | 9034 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | 110 | 210 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3818.7

| Compound | E & E Lab. No. 86- | 6006 | 6007 | 6008 | 6009 | 6010 | 6011 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9035 | 9036 | 9037 | 9038 | 9039 | 9040 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3818.8

| Compound | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| carbon tetrachloride | 6011 | <250 | <250 | -- |
| 1,2-dichloroethane | 6011 | <100 | <100 | -- |
| 1,1,1-trichloroethane | 6011 | <250 | <250 | -- |
| 1,1-dichloroethane | 6011 | <100 | <100 | -- |
| 1,1,2-trichloroethane | 6011 | <500 | <500 | -- |
| 1,1,2,2-tetrachloroethane | 6011 | <250 | <250 | -- |
| chloroethane | 6011 | <500 | <500 | -- |
| 2-chloroethylvinyl ether | 6011 | <5000 | <5000 | -- |
| chloroform | 6011 | <250 | <250 | -- |
| 1,1-dichloroethene | 6011 | <100 | <100 | -- |
| trans-1,2-dichloroethene | 6011 | <100 | <100 | -- |
| 1,2-dichloropropane | 6011 | <1000 | <1000 | -- |
| trans-1,3-dichloropropene | 6011 | <1000 | <1000 | -- |
| cis-1,3-dichloropropene | 6011 | <1000 | <1000 | -- |
| methylene chloride | 6011 | <50 | <50 | -- |
| chloromethane | 6011 | <500 | <500 | -- |
| bromomethane | 6011 | <500 | <500 | -- |
| bromoform | 6011 | <1000 | <1000 | -- |
| bromodichloromethane | 6011 | <250 | <250 | -- |
| fluorotrichloromethane | 6011 | <500 | <500 | -- |
| dichlorodifluoromethane | 6011 | <500 | <500 | -- |
| chlorodibromomethane | 6011 | <250 | <250 | -- |
| tetrachloroethene | 6011 | <250 | <250 | -- |
| trichloroethene | 6011 | <250 | <250 | -- |
| vinyl chloride | 6011 | <500 | <500 | -- |

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3818.9

| | |
|---|---|
| Job No.: U-3818 | RE: DF-2000 |
| Sample Date: 7/31/86 | P.O. No.: |
| Date Received: 8/1/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS & IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 6012 | 6013 | 6014 | Blank | | | |
| Customer No. | 9164 | 9165 | 9166 | | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | <0.5 | <0.5 | | | 5.0 |
| Barium | <5.0 | <5.0 | <5.0 | <5.0 | | | 100.0 |
| Cadmium | <0.1 | <0.1 | <0.1 | <0.1 | | | 1.0 |
| Chromium | <0.5 | <0.5 | <0.5 | <0.5 | | | 5.0 |
| Lead | <0.5 | <0.5 | <0.5 | <0.5 | | | 5.0 |
| Mercury | <0.0008 | <0.0008 | <0.0008 | <0.0008 | | | 0.2 |
| Selenium | <0.5 | <0.5 | <0.5 | <0.5 | | | 1.0 |
| Silver | <0.5 | <0.5 | <0.5 | <0.5 | | | 5.0 |
| Endrin | NR | NR | NR | NR | | | 0.02 |
| Lindane | NR | NR | NR | NR | | | 0.4 |
| Methoxychlor | NR | NR | NR | NR | | | 10.0 |
| Toxaphene | NR | NR | NR | NR | | | 0.5 |
| 2,4-D | NR | NR | NR | NR | | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | NR | NR | | | 1.0 |
| Ignitability, °F | >140 | >140 | >140 | NA | | | NA |

NA: Not Applicable NR: Analysis not requested.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn/KAS

Date: August 25, 1986



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ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSES
FOR PHENOLS BY GC

(all results in ug/g)

U-3818.10

| | E & E Lab. No. 86- | 6004 | 6005 | 6006 | 6007 | 6008 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9033 | 9034 | 9035 | 9036 | 9037 |
| 4-Chloro-3-Methylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-Chlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-Dichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-Dimethylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-Dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-Methyl-4,6-Dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-Nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4-Nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Pentachlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Phenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4,6-Trichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSES
FOR PHENOLS BY GC

(all results in ug/g)

U-3818.11

| | E & E Lab. No. 86- | 6009 | 6010 | 6011 | Blank | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9038 | 9039 | 9040 | 8/5/86 | |
| 4-Chloro-3-Methylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| 2-Chlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| 2,4-Dichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| 2,4-Dimethylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| 2,4-Dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| 2-Methyl-4,6-Dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| 2-Nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| 4-Nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| Pentachlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| Phenol | | <1.0 | <1.0 | <1.0 | <1.0 | |
| 2,4,6-Trichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | |

QUALITY CONTROL FOR SPIKED
SAMPLES OF SOIL ANALYSIS

U-3818.12

| Compound | E & E Lab. No. 86-6009 | ug/g | | | Percent Recovery |
|---|---|---|---|---|---|
| | | Original Analysis | Amt. Spiked | Amt. Deter. | |
| phenol | | <1.0 | 20 | 12 | 60 |
| 2-chlorophenol | | <1.0 | 20 | 12 | 60 |
| 2-nitrophenol | | <1.0 | 20 | 9 | 45 |
| 2,4-dimethylphenol | | <1.0 | 20 | 14 | 70 |
| 2,4-dichlorophenol | | <1.0 | 20 | 13 | 65 |
| 4-chloro-3-methylphenol | | <1.0 | 20 | 18 | 90 |
| 2,4,6-trichlorophenol | | <1.0 | 20 | 16 | 80 |
| 2,4-dinitrophenol | | <1.0 | 20 | 13 | 65 |
| 4-nitrophenol | | <1.0 | 20 | 14 | 70 |
| 4,6-dinitro-2-methylphenol | | <1.0 | 20 | 16 | 80 |
| pentachlorophenol | | <1.0 | 20 | 14 | 70 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF E.P. TOXICITY TESTS

U-3818.13

| Parameter | E & E Laboratory No. 86- | (ppm) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Arsenic | 6012 | <0.5 | <0.5 | -- |
| Barium | 6012 | <5.0 | <5.0 | -- |
| Cadmium | 6012 | <0.1 | <0.1 | -- |
| Chromium | 6012 | <0.5 | <0.5 | -- |
| Lead | 6012 | <0.5 | <0.5 | -- |
| Mercury | 6012 | <0.0008 | <0.0008 | -- |
| Selenium | 6012 | <0.5 | <0.5 | -- |
| Silver | 6012 | <0.5 | <0.5 | -- |
| Solids, % | 6008 | 87 | 86 | 1.2 |
| Flashpoint, °F | 6173* | >140 | >140 | -- |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3818.14

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 6011 | <100 | 4290 | 5020 | 117 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3879.4

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6426 | 9029 | 0165-NP-002-GN-86-9029 |
| 6427 | 9030 | 0165-NP-002-GN-86-9030 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3879

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3879 | 6426 | 8/7 | 8/21 | 8/11,12 | 8/14 | 8/11 | 9/10 | 8/13 | 8/14 | 8/11 | 9/20 | 8/18 | 8/14 | 8/11 | 8/21 | 8/14 | 8/14 | 8/12 | 9/11 | 8/15 |
| | 6427 | 8/7 | 8/21 | 8/11,12 | 8/14 | 8/11 | 9/10 | 8/13 | 8/14 | 8/11 | 9/20 | 8/18 | 8/14 | 8/11 | 8/21 | 8/14 | 8/14 | 8/12 | 9/11 | 8/18 |

VOA
CONFIRMATION
DATE

6426 8/15

6427 8/15

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3879.2

| Job | Sample Number | Sample Date | PAH (7/S + 30) Extraction Dead | PAH (7/S + 30) Extraction Extr | PAH (7/S + 30) Analysis Dead | PAH (7/S + 30) Analysis Anal | BNA(7/E + 40) Extraction Dead | BNA(7/E + 40) Extraction Extr | BNA(7/E + 40) Analysis Dead | BNA(7/E + 40) Analysis Anal | IDS (7) Dead | IDS (7) Anal | O&G(28) Dead | O&G(28) Anal | Pet. HC(28) Dead | Pet. HC(28) Anal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3879 | 6426 | 8/7 | -- | -- | -- | -- | 8/14 | 8/12 | 9/21 | 8/13 | 8/14 | 8/13 | 9/4 | 8/18 | -- | -- |
| | 6427 | 8/7 | -- | -- | -- | -- | 8/14 | 8/12 | 9/21 | 8/13 | 8/14 | 8/13 | 9/4 | 8/18 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/L)

U-3879.5

| Compound | E & E Lab. No. 86- | Blank | 6426 | 6427 | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/21/86 | 9029 | 9030 | | | |
| carbon tetrachloride | | <0.12 | <0.12 | <0.12 | | | |
| 1,2-dichloroethane | | <0.03 | <0.03 | <0.03 | | | |
| 1,1,1-trichloroethane | | <0.03 | <0.03 | <0.03 | | | |
| 1,1-dichloroethane | | <0.07 | <0.07 | <0.07 | | | |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | <0.02 | | | |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | <0.03 | | | |
| chloroethane | | <0.52 | <0.52 | <0.52 | | | |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | <0.13 | | | |
| chloroform | | <0.05 | <0.05 | <0.05 | | | |
| 1,1-dichloroethene | | <0.13 | <0.13 | <0.13 | | | |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | <0.10 | | | |
| 1,2-dichloropropane | | <0.04 | <0.04 | <0.04 | | | |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | <0.34 | | | |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | <0.20 | | | |
| methylene chloride | | <0.25 | <0.25 | <0.25 | | | |
| chloromethane | | <0.08 | <0.08 | <0.08 | | | |
| bromomethane | | <1.18 | <1.18 | <1.18 | | | |
| bromoform | | <0.20 | <0.20 | <0.20 | | | |
| bromodichloromethane | | <0.10 | <0.10 | <0.10 | | | |
| fluorotrichloromethane | | <2.0 | <2.0 | <2.0 | | | |
| dichlorodifluoromethane | | <1.81 | <1.81 | <1.81 | | | |
| chlorodibromomethane | | <0.09 | <0.09 | <0.09 | | | |
| tetrachloroethene | | <0.03 | <0.03 | <0.03 | | | |
| trichloroethene | | <0.12 | <0.12 | <0.12 | | | |
| vinyl chloride | | <0.18 | <0.18 | <0.18 | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3879.6

| Compound | E & E Lab. No. 86- | 6426 | 6427 | Method Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9029 | 9030 | | | |
| bis(2-chloroethyl)ether | | <10 | <10 | <10 | | |
| 1,3-dichlorobenzene | | <10 | <10 | <10 | | |
| 1,4-dichlorobenzene | | <10 | <10 | <10 | | |
| 1,2-dichlorobenzene | | <10 | <10 | <10 | | |
| bis(2-chloroisopropyl)ether | | <10 | <10 | <10 | | |
| N-nitrosodipropylamine | | <10 | <10 | <10 | | |
| hexachloroethane | | <10 | <10 | <10 | | |
| nitrobenzene | | <10 | <10 | <10 | | |
| isophorone | | <10 | <10 | <10 | | |
| bis(2-chloroethoxy)methane | | <10 | <10 | <10 | | |
| 1,2,4-trichlorobenzene | | <10 | <10 | <10 | | |
| naphthalene | | <10 | <10 | <10 | | |
| hexachlorobutadiene | | <10 | <10 | <10 | | |
| hexachlorocyclopentadiene | | <10 | <10 | <10 | | |
| 2-chloronaphthalene | | <10 | <10 | <10 | | |
| dimethyl phthalate | | <10 | <10 | <10 | | |
| acenaphthylene | | <10 | <10 | <10 | | |
| fluorene | | <10 | <10 | <10 | | |
| acenaphthene | | <10 | <10 | <10 | | |
| 2,4-dinitrotoluene | | <10 | <10 | <10 | | |
| 2,6-dinitrotoluene | | <10 | <10 | <10 | | |
| diethylphthalate | | <10 | <10 | <10 | | |
| 4-chlorophenyl phenyl ether | | <10 | <10 | <10 | | |
| N-nitrosodiphenylamine | | <10 | <10 | <10 | | |
| 4-bromophenyl phenyl ether | | <10 | <10 | <10 | | |
| hexachlorobenzene | | <10 | <10 | <10 | | |
| phenanthrene | | <10 | <10 | <10 | | |
| anthracene | | <10 | <10 | <10 | | |
| di-n-butyl phthalate | | <10 | <10 | <10 | | |
| fluoranthene | | <10 | <10 | <10 | | |
| benzidine | | <50 | <50 | <50 | | |
| pyrene | | <10 | <10 | <10 | | |
| butyl benzyl phthalate | | <10 | <10 | <10 | | |
| 3,3'-dichlorobenzidine | | <30 | <30 | <30 | | |
| benzo(a)anthracene | | <10 | <10 | <10 | | |
| bis(2-ethylhexyl)phthalate | | <10 | <10 | <10 | | |
| chrysene | | <10 | <10 | <10 | | |
| di-n-octyl phthalate | | <10 | <10 | <10 | | |
| benzo(b)fluoranthene | | <10 | <10 | <10 | | |
| benzo(k)fluoranthene | | <10 | <10 | <10 | | |
| benzo(a)pyrene | | <10 | <10 | <10 | | |
| indeno(1,2,3-cd)pyrene | | <10 | <10 | <10 | | |
| dibenzo(a,h)anthracene | | <10 | <10 | <10 | | |
| benzo(ghi)perylene | | <10 | <10 | <10 | | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3879.7

| Compound | E & E Laboratory No. 86-6427 | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| carbon tetrachloride | | <0.12 | <0.12 | -- |
| 1,2-dichloroethane | | <0.03 | <0.03 | -- |
| 1,1,1-trichloroethane | | <0.03 | <0.03 | -- |
| 1,1-dichloroethane | | <0.07 | <0.07 | -- |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | -- |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | -- |
| chloroethane | | <0.52 | <0.52 | -- |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | -- |
| chloroform | | <0.05 | <0.05 | -- |
| 1,1-dichloroethene | | <0.13 | <0.13 | -- |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | -- |
| 1,2-dichloropropane | | <0.04 | <0.04 | -- |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | -- |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | -- |
| methylene chloride | | <0.25 | <0.25 | -- |
| chloromethane | | <0.08 | <0.08 | -- |
| bromomethane | | <1.18 | <1.18 | -- |
| bromoform | | <0.20 | <0.20 | -- |
| bromodichloromethane | | <0.10 | <0.10 | -- |
| fluorotrichloromethane | | <2.0 | <2.0 | -- |
| dichlorodifluoromethane | | <1.81 | <1.81 | -- |
| chlorodibromomethane | | <0.09 | <0.09 | -- |
| tetrachloroethene | | <0.03 | <0.03 | -- |
| trichloroethene | | <0.12 | <0.12 | -- |
| vinyl chloride | | <0.18 | <0.18 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3879.8

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 2,4-D | DI Spike | <0.50 | 10.0 | 7.5 | 75 |
| Silvex (2,4,5-TP) | DI Spike | <0.05 | 10.0 | 6.4 | 64 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PRIORITY POLLUTANT PESTICIDES, PCBs, AND HERBICIDES BY GC

(all results in ug/L)

U-3879.9

| | E & E Lab. No. 86- | Blank | 6426* | 6427 | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 8/11/86 | 9029 | 9030 | | | | |
| Aldrin | | <0.05 | <0.25 | <0.05 | | | | |
| a-BHC | | <0.05 | <0.25 | <0.05 | | | | |
| b-BHC | | <0.05 | <0.25 | <0.05 | | | | |
| g-BHC | | <0.05 | <0.25 | <0.05 | | | | |
| d-BHC | | <0.05 | <0.25 | <0.05 | | | | |
| Chlordane | | <0.50 | <2.5 | <0.50 | | | | |
| 4,4'-DDD | | <0.10 | <0.50 | <0.10 | | | | |
| 4,4'-DDE | | <0.10 | <0.50 | <0.10 | | | | |
| 4,4'-DDT | | <0.10 | <0.50 | <0.10 | | | | |
| Dieldrin | | <0.10 | <0.50 | <0.10 | | | | |
| Endosulfan I | | <0.05 | <0.25 | <0.05 | | | | |
| Endosulfan II | | <0.10 | <0.50 | <0.10 | | | | |
| Endosulfan sulfate | | <0.10 | <0.50 | <0.10 | | | | |
| Endrin | | <0.10 | <0.50 | <0.10 | | | | |
| Endrin aldehyde | | <0.10 | <0.50 | <0.10 | | | | |
| Heptachlor | | <0.05 | <0.25 | <0.05 | | | | |
| Heptachlor epoxide | | <0.05 | <0.25 | <0.05 | | | | |
| PCB - 1016 | | <0.50 | <2.5 | <0.50 | | | | |
| PCB - 1221 | | <0.50 | <2.5 | <0.50 | | | | |
| PCB - 1232 | | <0.50 | <2.5 | <0.50 | | | | |
| PCB - 1242 | | <0.50 | <2.5 | <0.50 | | | | |
| PCB - 1248 | | <0.50 | <2.5 | <0.50 | | | | |
| PCB - 1254 | | <1.0 | <5.0 | <1.0 | | | | |
| PCB - 1260 | | <1.0 | <5.0 | <1.0 | | | | |
| Toxaphene | | <1.0 | <5.0 | <1.0 | | | | |
| 2,4-D | | <0.50 | <0.50 | <0.50 | | | | |
| 2,4,5-TP (Silvex) | | <0.05 | <0.05 | <0.05 | | | | |
| 2,4,5-T | | <0.05 | <0.05 | <0.05 | | | | |

*Elevated detection limits due to matrix interferences.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3879.10

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| nitrobenzene-D5 | 6426<br>6427 | 100<br>100 | 45<br>52 | 45<br>52 |
| 2-fluorobiphenyl | 6426<br>6427 | 100<br>100 | 48<br>51 | 48<br>51 |
| terphenyl-D14 | 6426<br>6427 | 100<br>100 | 44<br>50 | 44<br>50 |
| phenol-D5 | 6426<br>6427 | 200<br>200 | 82<br>90 | 41<br>45 |
| 2-fluorophenol | 6426<br>6427 | 200<br>200 | 71<br>90 | 35.5<br>45 |
| 2,4,6-tribromophenol | 6426<br>6427 | 200<br>200 | 68<br>79 | 34<br>39.5 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3879.11

| Parameter | E & E Laboratory No. 86- | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Aldrin | 6426 | <0.25 | <0.25 | -- |
| a-BHC | 6426 | <0.25 | <0.25 | -- |
| b-BHC | 6426 | <0.25 | <0.25 | -- |
| g-BHC | 6426 | <0.25 | <0.25 | -- |
| d-BHC | 6426 | <0.25 | <0.25 | -- |
| Chlordane | 6426 | <2.5 | <2.5 | -- |
| 4,4'-DDD | 6426 | <0.50 | <0.50 | -- |
| 4,4'-DDE | 6426 | <0.50 | <0.50 | -- |
| 4,4'-DDT | 6426 | <0.50 | <0.50 | -- |
| Dieldrin | 6426 | <0.50 | <0.50 | -- |
| Endosulfan I | 6426 | <0.25 | <0.25 | -- |
| Endosulfan II | 6426 | <0.50 | <0.50 | -- |
| Endosulfan sulfate | 6426 | <0.50 | <0.50 | -- |
| Endrin | 6426 | <0.50 | <0.50 | -- |
| Endrin aldehyde | 6426 | <0.50 | <0.50 | -- |
| Heptachlor | 6426 | <0.25 | <0.25 | -- |
| Heptachlor epoxide | 6426 | <0.25 | <0.25 | -- |
| PCB - 1016 | 6426 | <2.5 | <2.5 | -- |
| PCB - 1221 | 6426 | <2.5 | <2.5 | -- |
| PCB - 1232 | 6426 | <2.5 | <2.5 | -- |
| PCB - 1242 | 6426 | <2.5 | <2.5 | -- |
| PCB - 1248 | 6426 | <2.5 | <2.5 | -- |
| PCB - 1254 | 6426 | <5.0 | <5.0 | -- |
| PCB - 1260 | 6426 | <5.0 | <5.0 | -- |
| Toxaphene | 6426 | <5.0 | <5.0 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L)

U-3879.12

| Compound | E & E Lab. No. 86- | Blank | 6426* | 6427* | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/11/86 | 9029 | 9030 | | |
| chlorobenzene | | <0.20 | <0.20 | <0.20 | | |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | <0.40 | | |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | <0.40 | | |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | 1.1 | | |
| benzene | | <0.20 | <0.20 | <0.20 | | |
| total xylenes | | <1.0 | <1.0 | <1.0 | | |
| toluene | | <0.20 | 1.5 | <0.20 | | |
| ethylbenzene | | <0.20 | <0.20 | <0.20 | | |

*Sample confirmed - results positive

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3879.13

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Cadmium | 940 | 892 | 5.1 |
| Chromium | 1030 | 970 | 5.8 |
| Copper | 1030 | 969 | 5.9 |
| Lead | 53 | 49.9 | 5.8 |
| Nickel | 1020 | 971 | 4.8 |
| Zinc | 1010 | 934 | 7.5 |
| Oil and Grease | 22,650 | 20,300 | 10.4 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3879.14

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Total Dissolved Solids | 6426 | 300 | 280 | 6.9 |
| Cadmium | 6427 | <0.005 | <0.005 | -- |
| Chromium | 6427 | <0.05 | <0.05 | -- |
| Copper | 6427 | <0.02 | <0.02 | -- |
| Lead | 6427 | <0.005 | <0.005 | -- |
| Nickel | 6427 | <0.1 | <0.1 | -- |
| Zinc | 6427 | <0.05 | <0.05 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3879.15

| Compound | E & E Lab. No. 86- | 6426 | 6427 | Method Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9029 | 9030 | | | |
| phenol | | <10 | <10 | <10 | | |
| 2-chlorophenol | | <10 | <10 | <10 | | |
| 2-nitrophenol | | <10 | <10 | <10 | | |
| 2,4-dimethylphenol | | <10 | <10 | <10 | | |
| 2,4-dichlorophenol | | <10 | <10 | <10 | | |
| 4-chloro-3-methylphenol | | <10 | <10 | <10 | | |
| 2,4,6-trichlorophenol | | <10 | <10 | <10 | | |
| 2,4-dinitrophenol | | <30 | <30 | <30 | | |
| 4-nitrophenol | | <10 | <10 | <10 | | |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | <30 | | |
| pentachlorophenol | | <30 | <30 | <30 | | |

*Compound present below measurable detection limit

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3879.16

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3879 | | | RE: DF-2000 | | | |
| Sample Date: 8/7/86 | | | P.O. No.: | | | |
| Date Received: 8/8/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Water | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6426 | 6427 | Blank | | | |
| Customer No. | 9029 | 9030 | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/L unless noted | | | | | |
| Total Dissolved Solids | 300 | 360 | NA | | | |
| Oil and Grease | 2.1 | 1.3 | NA | | | |
| Cadmium | <0.005 | <0.005 | <0.005 | | | |
| Chromium | <0.05 | <0.05 | <0.05 | | | |
| Copper | <0.02 | <0.02 | <0.02 | | | |
| Lead | 0.007 | <0.005 | <0.005 | | | |
| Nickel | <0.1 | <0.1 | <0.1 | | | |
| Zinc | <0.05 | <0.05 | <0.05 | | | |

NA: Not Applicable

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983.

Supervising Analyst: [signature]

Date: September 15, 1986



recycled paper

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/L)

U-3879.17

| | E & E Lab. No. 86- | Blank | 6426 | 6427 | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 8/11/86 | 9029 | 9030 | | | | |
| Naled | | <0.10 | <0.10 | <0.10 | | | | |
| Phorate | | <0.15 | <0.15 | <0.15 | | | | |
| Disulfoton | | <0.20 | <0.20 | <0.20 | | | | |
| Chlorpyrifos | | <0.30 | <0.30 | <0.30 | | | | |
| Dimethoate | | <0.30 | <0.30 | <0.30 | | | | |
| Malathion | | <0.30 | <0.30 | <0.30 | | | | |
| Mevinphos | | <0.30 | <0.30 | <0.30 | | | | |
| Parathion | | <0.30 | <0.30 | <0.30 | | | | |
| Methyl parathion | | <0.30 | <0.30 | <0.30 | | | | |
| Diazinon | | <0.60 | <0.60 | <0.60 | | | | |
| Methyl azinphos | | <1.5 | <1.5 | <1.5 | | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3879.18

| Parameter | E & E Laboratory No. 86- | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Naled | 6426 | <0.10 | <0.10 | -- |
| Phorate | 6426 | <0.15 | <0.15 | -- |
| Disulfoton | 6426 | <0.20 | <0.20 | -- |
| Chlorpyrifos | 6426 | <0.30 | <0.30 | -- |
| Dimethoate | 6426 | <0.30 | <0.30 | -- |
| Malathion | 6426 | <0.30 | <0.30 | -- |
| Mevinphos | 6426 | <0.30 | <0.30 | -- |
| Parathion | 6426 | <0.30 | <0.30 | -- |
| Methyl parathion | 6426 | <0.30 | <0.30 | -- |
| Diazinon | 6426 | <0.60 | <0.60 | -- |
| Methyl azinphos | 6426 | <1.5 | <1.5 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3879.19

| Parameter | E & E Laboratory No. 86-Di Spike | Original Value (ug/L) | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|---|
| 4-chloro-3-methylphenol | | <0.36 | 40.0 | 24.2 | 60.5 |
| 2-chlorophenol | | <0.31 | 40.0 | 37.7 | 94.3 |
| 2,4-dichlorophenol | | <0.39 | 40.0 | 36.4 | 91.0 |
| 2,4-dimethylphenol | | <0.32 | 40.0 | 28.4 | 71.1 |
| 2-methyl-4,6-dinitrophenol | | <16 | 40.0 | 47.2 | 118 |
| 2-nitrophenol | | <0.45 | 40.0 | 35.0 | 87.5 |
| pentachlorophenol | | <7.4 | 40.0 | 26.4 | 65.9 |
| phenol | | <0.14 | 40.0 | 37.7 | 94.3 |
| 2,4,6-trichlorophenol | | <0.64 | 40.0 | 38.4 | 95.9 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-3879.20

| Compound | E & E Lab. No. 86- | Blank | 6426 * | 6427 * | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/12/86 | 9029 | 9030 | | |
| phenol | | <0.14 | <5.0 | <5.0 | | |
| 2-chlorophenol | | <0.31 | <5.0 | <5.0 | | |
| 2-nitrophenol | | <0.45 | <5.0 | <5.0 | | |
| 2,4-dimethylphenol | | <0.32 | <5.0 | <5.0 | | |
| 2,4-dichlorophenol | | <0.39 | <5.0 | <5.0 | | |
| 4-chloro-3-methylphenol | | <0.36 | <5.0 | <5.0 | | |
| 2,4,6-trichlorophenol | | <0.64 | <5.0 | <5.0 | | |
| 2,4-dinitrophenol | | <13.0 | <13.0 | <13.0 | | |
| 4-nitrophenol | | <2.8 | <5.0 | <5.0 | | |
| pentachlorophenol | | <7.4 | <7.4 | <7.4 | | |
| 2-methyl-4,6-dinitrophenol | | <16.0 | <16.0 | <16.0 | | |

* Elevated detection limits due to matrix interferences.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3930

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 7022 | 9042 | 0165-SO-002-GS-86-9042 |
| 7023 | 9043 | 0165-SO-002-GS-86-9043 |
| 7024 | 9183 | 0165-SO-002-GS-86-9183 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3930.12

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3930 | 7022 | 8/13 | 8/27 | 8/15,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/20 | 8/18 | 9/17 | 8/20 |
| | 7023 | 8/13 | 8/27 | 8/15,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/20 | 8/18 | 9/17 | 8/20 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3930.13

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3930 | 7022 | 8/13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/10 | 9/5 | -- | -- |
| | 7023 | 8/13 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/10 | 9/5 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3930.1

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3930 | | | RE: DF-2000 | | | |
| Sample Date: 8/13/86 | | | P.O. No.: | | | |
| Date Received: 8/14/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 7022 | 7023 | | | | |
| Customer No. | 9042 | 9043 | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg, as received unless noted | | | | | |
| Oil and Grease | <100 | 160 | | | | |
| Solids, % | 84 | 79 | | | | |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn/KS

Date: September 30, 1986



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ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3930.2

| Compound | E & E Lab. No. 86- | Blank | 7022 | 7023 | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/19/86 | 9042 | 9043 | | | |
| carbon tetrachloride | | <250 | <250 | <250 | | | |
| 1,2-dichloroethane | | <100 | <100 | <100 | | | |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | | | |
| 1,1-dichloroethane | | <100 | <100 | <100 | | | |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | | | |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | | | |
| chloroethane | | <500 | <500 | <500 | | | |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | | | |
| chloroform | | <250 | <250 | <250 | | | |
| 1,1-dichloroethene | | <100 | <100 | <100 | | | |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | | | |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | | | |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | | | |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | | | |
| methylene chloride | | 1,100 | <50 | <50 | | | |
| chloromethane | | <500 | <500 | <500 | | | |
| bromomethane | | <500 | <500 | <500 | | | |
| bromoform | | <1000 | <1000 | <1000 | | | |
| bromodichloromethane | | <250 | <250 | <250 | | | |
| fluorotrichloromethane | | <500 | <500 | <500 | | | |
| dichlorodifluoromethane | | <500 | <500 | <500 | | | |
| chlorodibromomethane | | <250 | <250 | <250 | | | |
| tetrachloroethene | | <250 | <250 | <250 | | | |
| trichloroethene | | <250 | <250 | <250 | | | |
| vinyl chloride | | <500 | <500 | <500 | | | |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3930.3

| Compound | E & E Lab. No. 86- | Blank | 7022 | 7023 | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/15/86 | 9042 | 9043 | | |
| chlorobenzene | | <250 | <250 | <250 | | |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | | |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | | |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | | |
| benzene | | <250 | <250 | <250 | | |
| total xylenes | | <500 | <500 | <500 | | |
| toluene | | <250 | <250 | <250 | | |
| ethylbenzene | | <250 | <250 | <250 | | |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3930.4

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| 1,2-dichlorobenzene | 7023 | <500 | 1250 | 1136 | 91 |
| 1,3-dichlorobenzene | 7023 | <500 | 1250 | 1151 | 92 |
| 1,4-dichlorobenzene | 7023 | <500 | 1250 | 1144 | 92 |
| toluene | 7023 | <250 | 1250 | 1176 | 94 |
| ethyl benzene | 7023 | <250 | 1250 | 1150 | 92 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3930.5

| Parameter | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | 7023 | <250 | <250 | -- |
| 1,2-dichlorobenzene | 7023 | <500 | <500 | -- |
| 1,3-dichlorobenzene | 7023 | <500 | <500 | -- |
| 1,4-dichlorobenzene | 7023 | <500 | <500 | -- |
| benzene | 7023 | <250 | <250 | -- |
| total xylenes | 7023 | <500 | <500 | -- |
| toluene | 7023 | <250 | <250 | -- |
| ethyl benzene | 7023 | <250 | <250 | -- |

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3930.6

| | |
|---|---|
| Job No.: U-3930 | RE: DF-2000 |
| Sample Date: 8/13/86 | P.O. No.: |
| Date Received: 8/14/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS AND IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 7024 | Blank | | | | | |
| Customer No. | 9183 | | | | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | | | | | 5.0 |
| Barium | <5 | <5 | | | | | 100.0 |
| Cadmium | <0.1 | <0.1 | | | | | 1.0 |
| Chromium | <0.5 | <0.5 | | | | | 5.0 |
| Lead | <0.5 | <0.5 | | | | | 5.0 |
| Mercury | <0.0008 | <0.0008 | | | | | 0.2 |
| Selenium | <0.5 | <0.5 | | | | | 1.0 |
| Silver | <0.5 | <0.5 | | | | | 5.0 |
| Endrin | NR | NR | | | | | 0.02 |
| Lindane | NR | NR | | | | | 0.4 |
| Methoxychlor | NR | NR | | | | | 10.0 |
| Toxaphene | NR | NR | | | | | 0.5 |
| 2,4-D | NR | NR | | | | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | | | | | 1.0 |
| Ignitability, °F | >140 | NA | | | | | |

NR: Not Requested
NA: Not Applicable

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: September 30, 1986



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ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PHENOLS BY GC

(all results in ug/g, as received)

U-3930.7

| Compound | E & E Lab. No. 86- | Blank | 7022 | 7023 | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/18/86 | 9042 | 9043 | | |
| phenol | | <1.0 | <1.0 | <1.0 | | |
| 2-chlorophenol | | <1.0 | <1.0 | <1.0 | | |
| 2-nitrophenol | | <1.0 | <1.0 | <1.0 | | |
| 2,4-dimethylphenol | | <1.0 | <1.0 | <1.0 | | |
| 2,4-dichlorophenol | | <1.0 | <1.0 | <1.0 | | |
| 4-chloro-3-methylphenol | | <1.0 | <1.0 | <1.0 | | |
| 2,4,6-trichlorophenol | | <1.0 | <1.0 | <1.0 | | |
| 2,4-dinitrophenol | | <1.0 | <1.0 | <1.0 | | |
| 4-nitrophenol | | <1.0 | <1.0 | <1.0 | | |
| 4,6-dinitro-2-methylphenol | | <1.0 | <1.0 | <1.0 | | |
| pentachlorophenol | | <1.0 | <1.0 | <1.0 | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3930.8

| Parameter | E & E Laboratory No. 86- | (ug/g) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| phenol | 7022 | <1.0 | <1.0 | -- |
| 2-chlorophenol | 7022 | <1.0 | <1.0 | -- |
| 2-nitrophenol | 7022 | <1.0 | <1.0 | -- |
| 2,4-dimethylphenol | 7022 | <1.0 | <1.0 | -- |
| 2,4-dichlorophenol | 7022 | <1.0 | <1.0 | -- |
| 4-chloro-3-methylphenol | 7022 | <1.0 | <1.0 | -- |
| 2,4,6-trichlorophenol | 7022 | <1.0 | <1.0 | -- |
| 2,4-dinitrophenol | 7022 | <1.0 | <1.0 | -- |
| 4-nitrophenol | 7022 | <1.0 | <1.0 | -- |
| 4,6-dinitro-2-methylphenol | 7022 | <1.0 | <1.0 | -- |
| pentachlorophenol | 7022 | <1.0 | <1.0 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3930.9

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 7023 | 160 | 4530 | 5400 | 119 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3930.10

| Parameter | E & E Laboratory No. 86- | Original Analysis | Replicate Analysis | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| Flashpoint, °F | 7024 | >140 | >140 | -- |
| Solids, % | 7094* | 96 | 96 | 0 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch.

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3930.11

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Arsenic | 46.0 | 44.5 | 3.3 |
| Barium | 119,600 | 115,950 | 3.0 |
| Cadmium | 1300 | 1220 | 6.2 |
| Chromium | 6500 | 6220 | 4.6 |
| Lead | 8000 | 7000 | 12.5 |
| Mercury | 4.4 | 4.41 | <0.5 |
| Selenium | 7.90 | 7.20 | 8.9 |
| Silver | 6000 | 6500 | 8.3 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3838

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6159 | 9061 | 0165-S0-003-GS-86-9061 |
| 6160 | 9062 | 0165-S0-003-GS-86-9062 |
| 6161 | 9063 | 0165-S0-003-GS-86-9063 |
| 6162 | 9064 | 0165-S0-003-GS-86-9064 |
| 6163 | 9065 | 0165-S0-003-GS-86-9065 |
| 6164 | 9066 | 0165-S0-003-GS-86-9066 |
| 6165 | 9067 | 0165-S0-003-GS-86-9067 |
| 6166 | 9068 | 0165-S0-003-GS-86-9068 |
| 6167 | 9069 | 0165-S0-003-GS-86-9069 |
| 6168 | 9070 | 0165-S0-003-GS-86-9070 |
| 6169 | 9071 | 0165-S0-003-GS-86-9071 |
| 6170 | 9143 | 0165-S0-003-GS-86-9143 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3838.1

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6171 | 9150 | 0165-SO-003-GS-86-9150 |
| 6172 | 9168 | 0165-SO-003-GS-86-9168 |
| 6173 | 9171 | 0165-SO-003-GS-86-9171 |
| 6174 | 9172 | 0165-SO-003-GS-86-9172 |
| 6175 | 9174 | 0165-SO-003-GS-86-9174 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3838.18

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3838 | 6159 | 8/3 | 8/17 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6160 | 8/3 | 8/17 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6161 | 8/3 | 8/17 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6162 | 8/3 | 8/17 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6163 | 8/3 | 8/17 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6164 | 8/3 | 8/17 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6165 | 8/3 | 8/17 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6166 | 8/3 | 8/17 | 8/6,7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6167 | 8/3 | 8/17 | 8/6,7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6168 | 8/3 | 8/17 | 8/7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6169 | 8/3 | 8/17 | 8/7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6170 | 8/3 | 8/17 | 8/7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6171 | 8/3 | 8/17 | 8/7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |



DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3838.19

| Job | Sample Number | Sample Date | PAH (7/S + 30) Extraction Dead | PAH (7/S + 30) Extraction Extr | PAH (7/S + 30) Analysis Dead | PAH (7/S + 30) Analysis Anal | BNA(7/E + 40) Extraction Dead | BNA(7/E + 40) Extraction Extr | BNA(7/E + 40) Analysis Dead | BNA(7/E + 40) Analysis Anal | TDS (7) Dead | TDS (7) Anal | O&G(28) Dead | O&G(28) Anal | Pet. HC(28) Dead | Pet. HC(28) Anal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3838 | 6159 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6160 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6161 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6162 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6163 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6164 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6165 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6166 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6167 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6168 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6169 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6170 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |
| | 6171 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/6 | 8/31 | 8/12 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3838.2

| Compound | E & E Lab. No. 86- | 6163 | 6164 | 6165 | 6166 | 6167 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9065 | 9066 | 9067 | 9068 | 9069 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3838.3

| Compound | E & E Lab. No. 86- | 6168 | 6169 | 6170 | 6171 | BLANK |
|---|---|---|---|---|---|---|
| | Sample Identity | 9070 | 9071 | 9143 | 9150 | 8/7/86 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3838.4

| Parameter | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | 6167 | <250 | <250 | — |
| 1,2-dichlorobenzene | 6167 | <500 | <500 | — |
| 1,3-dichlorobenzene | 6167 | <500 | <500 | — |
| 1,4-dichlorobenzene | 6167 | <500 | <500 | -- |
| benzene | 6167 | <250 | <250 | -- |
| total xylenes | 6167 | <500 | <500 | -- |
| toluene | 6167 | <250 | <250 | -- |
| ethyl benzene | 6167 | <250 | <250 | — |

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3838.5

| | |
|---|---|
| Job No.: U-3838 | RE: DF-2000 |
| Sample Date: 8/3/86 | P.O. No.: |
| Date Received: 8/5/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS AND IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 6172 | 6173 | 6174 | 6175 | BLANK | | |
| Customer No. | 9168 | 9171 | 9172 | 9174 | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 5.0 |
| Barium | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | | 100.0 |
| Cadmium | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | 1.0 |
| Chromium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 5.0 |
| Lead | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 5.0 |
| Mercury | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | | 0.2 |
| Selenium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 1.0 |
| Silver | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | 5.0 |
| Endrin | NR | NR | NR | NR | NR | | 0.02 |
| Lindane | NR | NR | NR | NR | NR | | 0.4 |
| Methoxychlor | NR | NR | NR | NR | NR | | 10.0 |
| Toxaphene | NR | NR | NR | NR | NR | | 0.5 |
| 2,4-D | NR | NR | NR | NR | NR | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | NR | NR | NR | | 1.0 |
| Ignitability, °F | >140 | >140 | >140 | >140 | NA | | |

NR: Analysis not requested

NA: Not Applicable

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: September 10, 1986



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ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3838.6

| Compound | E & E Lab. No. 86- | Blank | 6159 | 6160 | 6161 | 6162 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/6/86 | 9061 | 9062 | 9063 | 9064 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3838.7

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3838 | | | RE: DF-2000 | | | |
| Sample Date: 8/3/86 | | | P.O. No.: | | | |
| Date Received: 8/5/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6159 | 6160 | 6161 | 6162 | 6163 | 6164 |
| Customer No. | 9061 | 9062 | 9063 | 9064 | 9065 | 9066 |
| Sample Identity | | | | | | |
| | Results in: mg/kg as received | | | | | |
| Petroleum Hydrocarbons | <10 | <10 | <10 | <10 | <10 | <10 |
| Oil and Grease | <100 | <100 | 122 | <100 | <100 | 197 |
| Chromium | 5.92 | 10.5 | 10.4 | 7.38 | 7.60 | 8.21 |
| Lead | 3.80 | 5.46 | 4.23 | 2.80 | 2.81 | 7.22 |
| Solids, % | 88 | 88 | 89 | 89 | 88 | 87 |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn/kk

Date: September 30, 1986



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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3838.8

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3838 | | | RE: DF-2000 | | | |
| Sample Date: 8/3/86 | | | P.O. No.: | | | |
| Date Received: 8/5/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6165 | 6166 | 6167 | 6168 | 6169 | 6170 |
| Customer No. | 9067 | 9068 | 9069 | 9070 | 9071 | 9143 |
| Sample Identity | | | | | | |
| | Results in: mg/kg as received | | | | | |
| Petroleum Hydrocarbons | <10 | <10 | <10 | <10 | <10 | <10 |
| Oil and Grease | <100 | <100 | 100 | <100 | <100 | <100 |
| Chromium | 8.01 | 6.83 | 14.0 | 9.62 | 9.65 | 5.93 |
| Lead | 4.00 | 2.84 | 5.16 | 4.91 | 5.10 | 1.92 |
| Solids, % | 89 | 87 | 82 | 92 | 94 | 91 |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn / KS

Date: September 30, 1986



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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3838.9

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3838 | | | RE: DF-2000 | | | |
| Sample Date: 8/3/86 | | | P.O. No.: | | | |
| Date Received: 8/3/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6171 | Blank* | | | | |
| Customer No. | 9150 | | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg as received | | | | | |
| Petroleum Hydrocarbons | <10 | NA | | | | |
| Oil and Grease | <100 | NA | | | | |
| Chromium | 5.30 | <0.05 | | | | |
| Lead | 2.32 | <0.005 | | | | |
| Solids, % | 90 | NA | | | | |

*: mg/L

NA: Not Applicable

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: September 10, 1986



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ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3838.10

| Compound | E & E Lab. No. 86- | Blank | Blank | 6159 | 6160 | 6161 | 6162 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/6/86 | 8/7/86 | 9061 | 9062 | 9063 | 9064 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3838.11

| Compound | E & E Lab. No. 86- | 6163 | 6164 | 6165 | 6166 | 6167 | 6168 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9065 | 9066 | 9067 | 9068 | 9069 | 9070 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3838.12

| Compound | E & E Lab. No. 86- | 6169 | 6170 | 6171 | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9071 | 9143 | 9150 | | | |
| carbon tetrachloride | | <250 | <250 | <250 | | | |
| 1,2-dichloroethane | | <100 | <100 | <100 | | | |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | | | |
| 1,1-dichloroethane | | <100 | <100 | <100 | | | |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | | | |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | | | |
| chloroethane | | <500 | <500 | <500 | | | |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | | | |
| chloroform | | <250 | <250 | <250 | | | |
| 1,1-dichloroethene | | <100 | <100 | <100 | | | |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | | | |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | | | |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | | | |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | | | |
| methylene chloride | | <50 | <50 | <50 | | | |
| chloromethane | | <500 | <500 | <500 | | | |
| bromomethane | | <500 | <500 | <500 | | | |
| bromoform | | <1000 | <1000 | <1000 | | | |
| bromodichloromethane | | <250 | <250 | <250 | | | |
| fluorotrichloromethane | | <500 | <500 | <500 | | | |
| dichlorodifluoromethane | | <500 | <500 | <500 | | | |
| chlorodibromomethane | | <250 | <250 | <250 | | | |
| tetrachloroethene | | <250 | <250 | <250 | | | |
| trichloroethene | | <250 | <250 | <250 | | | |
| vinyl chloride | | <500 | <500 | <500 | | | |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3838.13

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| carbon tetrachloride | 6171 | <250 | 1250 | 1159 | 92.7 |
| 1,2-dichloroethane | 6171 | <100 | 1250 | 1185 | 94.8 |
| 1,1,1-trichloroethane | 6171 | <250 | 1250 | 1120 | 89.6 |
| 1,1-dichloroethane | 6171 | <100 | 1250 | 1199 | 95.9 |
| chloroethane | 6171 | <500 | 1250 | 1161 | 92.9 |
| chloroform | 6171 | <250 | 1250 | 1140 | 91.2 |
| trans-1,2-dichloroethene | 6171 | <100 | 1250 | 1115 | 89.2 |
| methylene chloride | 6171 | <50 | 1250 | 1030 | 82.4 |
| chloromethane | 6171 | <500 | 1250 | 1146 | 91.7 |
| bromomethane | 6171 | <500 | 1250 | 1375 | 110 |
| bromoform | 6171 | <1000 | 1250 | 1058 | 84.6 |
| bromodichloromethane | 6171 | <250 | 1250 | 959.1 | 76.7 |
| trichloroethene | 6171 | <250 | 1250 | 1192 | 95.4 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3838.14

| Compound | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| carbon tetrachloride | 6171 | <250 | <250 | -- |
| 1,2-dichloroethane | 6171 | <100 | <100 | -- |
| 1,1,1-trichloroethane | 6171 | <250 | <250 | -- |
| 1,1-dichloroethane | 6171 | <100 | <100 | -- |
| 1,1,2-trichloroethane | 6171 | <500 | <500 | -- |
| 1,1,2,2-tetrachloroethane | 6171 | <250 | <250 | -- |
| chloroethane | 6171 | <500 | <500 | -- |
| 2-chloroethylvinyl ether | 6171 | <5000 | <5000 | -- |
| chloroform | 6171 | <250 | <250 | -- |
| 1,1-dichloroethene | 6171 | <100 | <100 | -- |
| trans-1,2-dichloroethene | 6171 | <100 | <100 | -- |
| 1,2-dichloropropane | 6171 | <1000 | <1000 | -- |
| trans-1,3-dichloropropene | 6171 | <1000 | <1000 | -- |
| cis-1,3-dichloropropene | 6171 | <1000 | <1000 | -- |
| methylene chloride | 6171 | <50 | <50 | -- |
| chloromethane | 6171 | <500 | <500 | -- |
| bromomethane | 6171 | <500 | <500 | -- |
| bromoform | 6171 | <1000 | <1000 | -- |
| bromodichloromethane | 6171 | <250 | <250 | -- |
| fluorotrichloromethane | 6171 | <500 | <500 | -- |
| dichlorodifluoromethane | 6171 | <500 | <500 | -- |
| chlorodibromomethane | 6171 | <250 | <250 | -- |
| tetrachloroethene | 6171 | <250 | <250 | -- |
| trichloroethene | 6171 | <250 | <250 | -- |
| vinyl chloride | 6171 | <500 | <500 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF EP TOXICITY EXTRACTS

U-3838.15

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Arsenic | 6175 | <0.5 | <0.5 | -- |
| Barium | 6175 | <5 | <5 | -- |
| Cadmium | 6175 | <0.1 | <0.1 | -- |
| Chromium | 6175 | <0.5 | <0.5 | -- |
| Lead | 6175 | <0.5 | <0.5 | -- |
| Mercury | 6175 | <0.0008 | <0.0008 | -- |
| Selenium | 6175 | <0.5 | <0.5 | -- |
| Silver | 6175 | <0.5 | <0.5 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3838.16

| Parameter | E & E Laboratory No. 86- | (mg/kg) Original Analysis | (mg/kg) Replicate Analysis | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| Petroleum Hydrocarbon | 6170 | <10 | <10 | -- |
| Solids | 6061* | 89 | 89 | 0 |
| | 6054* | 91 | 91 | 0 |
| Flashpoint | 6173 | >140 | >140 | -- |
| Chromium | 6159 | 5.92 | 7.30 | 20.9 |
| | 6171 | 5.30 | 4.88 | 8.2 |
| Lead | 6159 | 3.80 | 3.54 | 7.1 |
| | 6171 | 2.32 | 1.89 | 20.4 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3838.17

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Petroleum Hydrocarbon | 6161 | <10 | 2190 | 2520 | 115 |
| Oil and Grease | 6160 | <100 | 4280 | 4960 | 116 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3854.3

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6227 | 9057 | 0165-SO-003-GS-86-9057 |
| 6228 | 9058 | 0165-SO-003-GS-86-9058 |
| 6229 | 9059 | 0165-SO-003-GS-86-9059 |
| 6230 | 9060 | 0165-SO-003-GS-86-9060 |
| 6231 | 9084 | 0165-SO-004-GS-86-9084 |
| 6232 | 9085 | 0165-SO-004-GS-86-9085 |
| 6233 | 9086 | 0165-SO-004-GS-86-9086 |
| 6234 | 9093 | 0165-SO-007-GS-86-9093 |
| 6235 | 9094 | 0165-SO-007-GS-86-9094 |
| 6236 | 9095 | 0165-SO-007-GS-86-9095 |
| 6237 | 9096 | 0165-SO-007-GS-86-9096 |
| 6238 | 9097 | 0165-SO-007-GS-86-9097 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3854.4

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6239 | 9098 | 0165-SO-007-GS-86-9098 |
| 6240 | 9099 | 0165-SO-007-GS-86-9099 |
| 6241 | 9100 | 0165-SO-007-GS-86-9100 |
| 6242 | 9101 | 0165-SO-007-GS-86-9101 |
| 6243 | 9102 | 0165-SO-007-GS-86-9102 |
| 6244 | 9103 | 0165-SO-007-GS-86-9103 |
| 6245 | 9104 | 0165-SO-007-GS-86-9104 |
| 6246 | 9138 | 0165-SO-007-GS-86-9138 |
| 6247 | 9173 | 0165-SO-003-GS-86-9173 |
| 6248 | 9174 | 0165-SO-004-GS-86-9174 |
| 6249 | 9175 | 0165-SO-007-GS-86-9175 |
| 6250 | 9176 | 0165-SO-007-GS-86-9176 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3854.5

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6251 | 9177 | 0165-SO-007-GS-86-9177 |
| 6252 | 9178 | 0165-SO-007-GS-86-9178 |
| 6253 | 9179 | 0165-SO-007-GS-86-9179 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3854

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3854 | 6227 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/14 | 8/31 | 9/2* |
| | 6228 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/14 | 8/31 | 9/2* |
| | 6229 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/14 | 8/31 | 9/2* |
| | 6230 | 8/3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/31 | 8/14 | 8/31 | 9/2* |
| | 6231 | 8/5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/2 | 8/14 | -- | -- |
| | 6232 | 8/5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/2 | 8/14 | -- | -- |
| | 6233 | 8/5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/2 | 8/14 | -- | -- |
| | 6234 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/14 | -- | -- |
| | 6235 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/14 | -- | -- |
| | 6236 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/14 | -- | -- |
| | 6237 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |
| | 6238 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |
| | 6239 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |
| | 6240 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |
| | 6241 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |

*Analyzed late

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3854.1

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3854 | 6242 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |
| | 6243 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |
| | 6244 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |
| | 6245 | 8/5 | 8/12 | 8/7 | 9/4 | 8/13 | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |
| | 6246 | 8/5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/2 | 8/15 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3854.2

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3854 | 6227 | 8/5 | 8/19 | 8/7,8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6228 | 8/5 | 8/19 | 8/7,8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6229 | 8/5 | 8/19 | 8/7,8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6230 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6231 | 8/5 | 8/19 | 8/7,11 | 8/12 | 8/11 | 9/6 | 8/13 | 8/12 | 8/7 | 9/16 | 8/12 | 8/12 | 8/7 | 9/6 | 8/8 | -- | -- | -- | -- |
| | 6232 | 8/5 | 8/19 | 8/7,11 | 8/12 | 8/11 | 9/6 | 8/13 | 8/12 | 8/7 | 9/16 | 8/12 | 8/12 | 8/7 | 9/6 | 8/8 | -- | -- | -- | -- |
| | 6233 | 8/5 | 8/19 | 8/7,11 | 8/12 | 8/11 | 9/6 | 8/13 | 8/12 | 8/7 | 9/16 | 8/12 | 8/12 | 8/7 | 9/6 | 8/8 | -- | -- | -- | -- |
| | 6234 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6235 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6236 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6237 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6238 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6239 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6240 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6241 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6242 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6243 | 8/5 | 8/19 | 8/7,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6244 | 8/5 | 8/19 | 8/8,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6245 | 8/5 | 8/19 | 8/8,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6246 | 8/5 | 8/19 | 8/8,11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3854.6

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: | U-3854 | | RE: | DF-2000 | | |
| Sample Date: | 8/3 & 5/86 | | P.O. No.: | | | |
| Date Received: | 8/6/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Soil | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 6227 | 6228 | 6229 | 6230 | 6231 | 6232 |
| Customer No. | 9057 | 9058 | 9059 | 9060 | 9084 | 9085 |
| Sample Identity | | | | | | |
| | Results in: mg/kg* unless noted | | | | | |
| Petroleum Hydrocarbons | 49 | <10 | 100 | <10 | NR | NR |
| Oil and Grease | <100 | <100 | <100 | <100 | 138 | <100 |
| Antimony | NR | NR | NR | NR | <15 | <15 |
| Beryllium | NR | NR | NR | NR | <1 | <1 |
| Cadmium | NR | NR | NR | NR | <0.5 | <0.5 |
| Chromium | 8.62 | 5.46 | 9.42 | 6.98 | 5.13 | 7.98 |
| Copper | NR | NR | NR | NR | 3.66 | 5.34 |
| Lead | 6.49 | 3.00 | 5.65 | 4.58 | 4.06 | 4.38 |
| Nickel | NR | NR | NR | NR | <10 | <10 |
| Silver | NR | NR | NR | NR | <4 | <4 |
| Thallium | NR | NR | NR | NR | <20 | <20 |
| Zinc | NR | NR | NR | NR | 12.0 | 20.0 |
| Solids, % | 93 | 92 | 92 | 91 | 88 | 77 |

*: As received.
+: Elevated detection limits due to matrix interferences.
NR: Analysis not requested.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

H-193

Supervising Analyst: Jay Hahn/KB

Date: September 10, 1986

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3854.7

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: | U-3854 | | RE: | DF-2000 | | |
| Sample Date: | 8/3 & 5/86 | | P.O. No.: | | | |
| Date Received: | 8/6/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Soil | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 6233 | 6234 | 6235 | 6236 | 6237 | 6238 |
| Customer No. | 9086 | 9093 | 9094 | 9095 | 9096 | 9097 |
| Sample Identity | | | | | | |
| | Results in: mg/kg* unless noted | | | | | |
| Oil and Grease | <100 | <100 | 158 | <100 | <100 | 139 |
| Antimony | <15 | NR | NR | NR | NR | NR |
| Beryllium | <1 | NR | NR | NR | NR | NR |
| Cadmium | <0.5 | NR | NR | NR | NR | NR |
| Chromium | <5 | NR | NR | NR | NR | NR |
| Copper | 2.12 | NR | NR | NR | NR | NR |
| Lead | 2.90 | NR | NR | NR | NR | NR |
| Nickel | <10 | NR | NR | NR | NR | NR |
| Silver | <4 | NR | NR | NR | NR | NR |
| Thallium | <20 | NR | NR | NR | NR | NR |
| Zinc | 7.69 | NR | NR | NR | NR | NR |
| Solids, % | 87 | 92 | 91 | 90 | 93 | 91 |

NR: Analysis not requested.
*: As received.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]
Date: September 10, 1986



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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3854.8

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: | U-3854 | | RE: | DF-2000 | | |
| Sample Date: | 8/3 & 5/86 | | P.O. No.: | | | |
| Date Received: | 8/6/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Soil | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 6239 | 6240 | 6241 | 6242 | 6243 | 6244 |
| Customer No. | 9098 | 9099 | 9100 | 9101 | 9102 | 9103 |
| Sample Identity | | | | | | |
| | *Results in: mg/kg* unless noted* | | | | | |
| Oil and Grease<br>Solids, % | <100<br>94 | 178<br>94 | <100<br>93 | <100<br>92 | 1400<br>92 | <100<br>93 |

*: As received.
NR: Analysis not requested.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]
Date: September 10, 1986



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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3854.9

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: | U-3854 | | RE: | DF-2000 | | |
| Sample Date: | 8/3 & 5/86 | | P.O. No.: | | | |
| Date Received: | 8/6/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Soil | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 6245 | 6246 | Blank† | | | |
| Customer No. | 9104 | 9138 | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg* unless noted | | | | | |
| Petroleum Hydrocarbons | NR | NR | <10 | | | |
| Oil and Grease | <100 | <100 | NA | | | |
| Antimony | NR | NR | <0.15 | | | |
| Beryllium | NR | NR | <0.01 | | | |
| Cadmium | NR | NR | <0.005 | | | |
| Chromium | NR | NR | <0.05 | | | |
| Copper | NR | NR | <0.02 | | | |
| Lead | NR | NR | <0.005 | | | |
| Nickel | NR | NR | <0.1 | | | |
| Silver | NR | NR | <0.04 | | | |
| Thallium | NR | NR | <0.20 | | | |
| Zinc | NR | NR | <0.05 | | | |
| Solids, % | 93 | 93 | NA | | | |

NR: Analysis not requested.
NA: Not applicable
* : As received.
† : mg/L

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn/KOS
Date: September 10, 1986



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ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3854.10

| Compound | E & E Lab. No. 86- | Blank | Blank | 6227 | 6228 | 6229 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/7/86 | 8/7/86 | 9057 | 9058 | 9059 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3854.11

| Compound | E & E Lab. No. 86- | 6230 | 6231 | 6232 | 6233 | 6234 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9060 | 9084 | 9085 | 9086 | 9093 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3854.12

| Compound | E & E Lab. No. 86- | 6235 | 6236 | 6237 | 6238 | 6239 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9094 | 9095 | 9096 | 9097 | 9098 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3854.13

| Compound | E & E Lab. No. 86- | 6240 | 6241 | 6242 | 6243 | 6244 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9099 | 9100 | 9101 | 9102 | 9103 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3854.14

| Compound | E & E Lab. No. 86- | 6245 | 6246 | Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9104 | 9138 | 8/8/86 | | |
| chlorobenzene | | <250 | <250 | <250 | | |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | | |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | | |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | | |
| benzene | | <250 | <250 | <250 | | |
| total xylenes | | <500 | <500 | <500 | | |
| toluene | | <250 | <250 | <250 | | |
| ethylbenzene | | <250 | <250 | <250 | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3854.15

| Parameter | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | 6236 | <250 | <250 | -- |
| 1,2-dichlorobenzene | 6236 | <500 | <500 | -- |
| 1,3-dichlorobenzene | 6236 | <500 | <500 | -- |
| 1,4-dichlorobenzene | 6236 | <500 | <500 | -- |
| benzene | 6236 | <250 | <250 | -- |
| total xylenes | 6236 | <500 | <500 | -- |
| toluene | 6236 | <250 | <250 | -- |
| ethyl benzene | 6236 | <250 | <250 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3854.16

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| 1,2-dichlorobenzene | 6243 | <500 | 1250 | 1189 | 95 |
| 1,3-dichlorobenzene | 6243 | <500 | 1250 | 924 | 74 |
| 1,4-dichlorobenzene | 6243 | <500 | 1250 | 1133 | 91 |
| toluene | 6243 | <250 | 1250 | 932 | 75 |
| ethyl benzene | 6243 | <250 | 1250 | 1021 | 82 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in mg/kg as received)

U-3854.17

| | E & E Lab. No. 86- | Blank | 6231 | 6232 | 6233 | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 8/7/86 | 9084 | 9085 | 9086 | | | |
| Naled | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Phorate | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Disulfoton | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Chlorpyrifos | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Dimethoate | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Malathion | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Mevinphos | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Parathion | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Methyl parathion | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Diazinon | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Methyl azinphos | | <1.0 | <1.0 | <1.0 | <1.0 | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3854.18

| Parameter | E & E Laboratory No. 86- | (mg/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Naled | 6231 | <1.0 | <1.0 | -- |
| Phorate | 6231 | <1.0 | <1.0 | -- |
| Disulfoton | 6231 | <1.0 | <1.0 | -- |
| Chlorpyrifos | 6231 | <1.0 | <1.0 | -- |
| Dimethoate | 6231 | <1.0 | <1.0 | -- |
| Malathion | 6231 | <1.0 | <1.0 | -- |
| Mevinphos | 6231 | <1.0 | <1.0 | -- |
| Parathion | 6231 | <1.0 | <1.0 | -- |
| Methyl parathion | 6231 | <1.0 | <1.0 | -- |
| Diazinon | 6231 | <1.0 | <1.0 | -- |
| Methyl azinphos | 6231 | <1.0 | <1.0 | -- |

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3854.19

| | |
|---|---|
| Job No.: U-3854 | RE: DF-2000 |
| Sample Date: 8/3,5/86 | P.O. No.: |
| Date Received: 8/6/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS & IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 6247 | 6248 | 6249 | 6250 | 6251 | 6252 | |
| Customer No. | 9173 | 9174 | 9175 | 9176 | 9177 | 9178 | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 5.0 |
| Barium | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 100.0 |
| Cadmium | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 1.0 |
| Chromium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 5.0 |
| Lead | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 5.0 |
| Mercury | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | <0.0008 | 0.2 |
| Selenium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 1.0 |
| Silver | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | 5.0 |
| Endrin | NR | NR | NR | NR | NR | NR | 0.02 |
| Lindane | NR | NR | NR | NR | NR | NR | 0.4 |
| Methoxychlor | NR | NR | NR | NR | NR | NR | 10.0 |
| Toxaphene | NR | NR | NR | NR | NR | NR | 0.5 |
| 2,4-D | NR | NR | NR | NR | NR | NR | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | NR | NR | NR | NR | 1.0 |
| Ignitability, °F | >140 | >140 | >140 | >140 | >140 | >140 | |

NR: Not requested.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Kobylik/KES

Date: September 10, 1986



recycled paper

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3854.20

| | |
|---|---|
| Job No.: U-3854 | RE: DF-2000 |
| Sample Date: 8/3,5/86 | P.O. No.: |
| Date Received: 8/6/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS & IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 6253 | Blank | | | | | |
| Customer No. | 9179 | | | | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | | | | | 5.0 |
| Barium | <5.0 | <5.0 | | | | | 100.0 |
| Cadmium | <0.1 | <0.1 | | | | | 1.0 |
| Chromium | <0.5 | <0.5 | | | | | 5.0 |
| Lead | <0.5 | <0.5 | | | | | 5.0 |
| Mercury | <0.0008 | <0.0008 | | | | | 0.2 |
| Selenium | <0.5 | <0.5 | | | | | 1.0 |
| Silver | <0.5 | <0.5 | | | | | 5.0 |
| Endrin | NR | NR | | | | | 0.02 |
| Lindane | NR | NR | | | | | 0.4 |
| Methoxychlor | NR | NR | | | | | 10.0 |
| Toxaphene | NR | NR | | | | | 0.5 |
| 2,4-D | NR | NR | | | | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | | | | | 1.0 |
| Ignitability, °F | >140 | NA | | | | | |

NR: Not requested.
NA: Not applicable.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]
Date: September 10, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3854.21

| Compound | E & E Lab. No. 86- | Blank | Blank | Blank | Blank | 6227 | 6228 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/8/86 | 8/11/86 | 8/11/86 | 8/11/86 | 9057 | 9058 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | 120 | 66 | 100 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3854.22

| Compound | E & E Lab. No. 86- | 6229 | 6230 | 6231 | 6232 | 6233 | 6234 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9059 | 9060 | 9084 | 9085 | 9086 | 9093 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3854.23

| Compound | E & E Lab. No. 86- | 6235 | 6236 | 6237 | 6238 | 6239 | 6240 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9094 | 9095 | 9096 | 9097 | 9098 | 9099 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3854.24

| Compound | E & E Lab. No. 86- | 6241 | 6242 | 6243 | 6244 | 6245 | 6246 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9100 | 9101 | 9102 | 9103 | 9104 | 9138 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3854.25

| Compound | E & E Laboratory No. 86-6236 | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| carbon tetrachloride | | <250 | <250 | -- |
| 1,2-dichloroethane | | <100 | <100 | -- |
| 1,1,1-trichloroethane | | <250 | <250 | -- |
| 1,1-dichloroethane | | <100 | <100 | -- |
| 1,1,2-trichloroethane | | <500 | <500 | -- |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | -- |
| chloroethane | | <500 | <500 | -- |
| 2-chloroethylvinyl ether | | <5000 | <5000 | -- |
| chloroform | | <250 | <250 | -- |
| 1,1-dichloroethene | | <100 | <100 | -- |
| trans-1,2-dichloroethene | | <100 | <100 | -- |
| 1,2-dichloropropane | | <1000 | <1000 | -- |
| trans-1,3-dichloropropene | | <1000 | <1000 | -- |
| cis-1,3-dichloropropene | | <1000 | <1000 | -- |
| methylene chloride | | <50 | <50 | |
| chloromethane | | <500 | <500 | -- |
| bromomethane | | <500 | <500 | -- |
| bromoform | | <1000 | <1000 | -- |
| bromodichloromethane | | <250 | <250 | -- |
| fluorotrichloromethane | | <500 | <500 | -- |
| dichlorodifluoromethane | | <500 | <500 | -- |
| chlorodibromomethane | | <250 | <250 | -- |
| tetrachloroethene | | <250 | <250 | -- |
| trichloroethene | | <250 | <250 | -- |
| vinyl chloride | | <500 | <500 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3854.26

| Compound | E & E Laboratory No. 86-6246 | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| carbon tetrachloride | | <250 | 1250 | 1115 | 89.2 |
| 1,2-dichloroethane | | <100 | 1250 | 1300 | 104 |
| 1,1,1-trichloroethane | | <250 | 1250 | 1165 | 93.2 |
| 1,1-dichloroethane | | <100 | 1250 | 1161 | 92.9 |
| chloroethane | | <500 | 1250 | 1072 | 85.8 |
| chloroform | | <250 | 1250 | 1250 | 100 |
| trans-1,2-dichloroethene | | <100 | 1250 | 1215 | 97.2 |
| methylene chloride | | <50 | 1250 | 1004 | 80.3 |
| chloromethane | | <500 | 1250 | 941.2 | 75.3 |
| bromomethane | | <500 | 1250 | 1191 | 95.3 |
| bromoform | | <1000 | 1250 | 1450 | 116 |
| bromodichloromethane | | <250 | 1250 | 1099 | 87.9 |
| trichloroethene | | <250 | 1250 | 1288 | 103 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PRIORITY POLLUTANT PESTICIDES, PCBs AND HERBICIDES BY GC

(all results in ug/g as received)

U-3854.27

| | E & E Lab. No. 86- | 6231 | 6232 | 6233 | Blank | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9084 | 9085 | 9086 | 8/7/86 | | | |
| Aldrin | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| a-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| b-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| g-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| d-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Chlordane | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 4,4'-DDD | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 4,4'-DDE | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 4,4'-DDT | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Dieldrin | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endosulfan I | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endosulfan II | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endosulfan sulfate | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endrin | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Endrin aldehyde | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Heptachlor | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Heptachlor epoxide | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1016 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1221 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1232 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1242 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1248 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 2,4-D | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 2,4,5-TP (Silvex) | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 2,4,5-T | | <1.0 | <1.0 | <1.0 | <1.0 | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3854.29

| Parameter | E & E Laboratory No. 86-6231 | (ug/g) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Aldrin | | <1.0 | <1.0 | -- |
| a-BHC | | <1.0 | <1.0 | -- |
| b-BHC | | <1.0 | <1.0 | -- |
| g-BHC | | <1.0 | <1.0 | -- |
| d-BHC | | <1.0 | <1.0 | -- |
| Chlordane | | <1.0 | <1.0 | -- |
| 4,4'-DDD | | <1.0 | <1.0 | -- |
| 4,4'-DDE | | <1.0 | <1.0 | -- |
| 4,4'-DDT | | <1.0 | <1.0 | -- |
| Dieldrin | | <1.0 | <1.0 | -- |
| Endosulfan I | | <1.0 | <1.0 | -- |
| Endosulfan II | | <1.0 | <1.0 | -- |
| Endosulfan sulfate | | <1.0 | <1.0 | -- |
| Endrin | | <1.0 | <1.0 | -- |
| Endrin aldehyde | | <1.0 | <1.0 | -- |
| Heptachlor | | <1.0 | <1.0 | -- |
| Heptachlor epoxide | | <1.0 | <1.0 | -- |
| PCB - 1016 | | <1.0 | <1.0 | -- |
| PCB - 1221 | | <1.0 | <1.0 | -- |
| PCB - 1232 | | <1.0 | <1.0 | -- |
| PCB - 1242 | | <1.0 | <1.0 | -- |
| PCB - 1248 | | <1.0 | <1.0 | -- |
| PCB - 1254 | | <1.0 | <1.0 | -- |
| PCB - 1260 | | <1.0 | <1.0 | -- |
| Toxaphene | | <1.0 | <1.0 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
POLYNUCLEAR AROMATIC HYDROCARBONS
(all results in ug/g as received)

U-3854.30

| Compound | E & E Lab. No. 86- | Blank | 6234 | 6235 | 6236 | 6237 | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/7/86 | 9093 | 9094 | 9095 | 9096 | |
| acenaphthene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| fluoranthene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| napthalene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(a)anthracene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(a)pyrene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(b)fluoranthene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(k)fluoranthene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| chrysene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| acenaphthylene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| anthracene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(ghi)perylene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| fluorene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| phenanthrene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| dibenzo(a,h)anthracene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| indeno(1,2,3-cd)pyrene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| pyrene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
POLYNUCLEAR AROMATIC HYDROCARBONS
(all results in ug/g as received)

U-3854.31

| Compound | E & E Lab. No. 86- | 6238 | 6239 | 6240 | 6241 | 6242 | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9097 | 9098 | 9099 | 9100 | 9101 | |
| acenaphthene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| fluoranthene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| naphthalene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(a)anthtacene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(a)pyrene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(b)fluoranthene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(k)fluoranthene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| chrysene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| acenaphthylene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| anthracene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| benzo(ghi)perylene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| fluorene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| phenanthrene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| dibenzo(a,h)anthracene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| indeno(1,2,3-cd)pyrene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |
| pyrene | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
POLYNUCLEAR AROMATIC HYDROCARBONS
(all results in ug/g as received)

U-3854.32

| Compound | E & E Lab. No. 86- | 6243 | 6244 | 6245 | 6246 | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9102 | 9103 | 9104 | 9138 | | |
| acenaphthene | | <1.0 | <1.0 | <1.0 | NA | | |
| fluoranthene | | <1.0 | <1.0 | <1.0 | NA | | |
| naphthalene | | <1.0 | <1.0 | <1.0 | NA | | |
| benzo(a)anthtacene | | <1.0 | <1.0 | <1.0 | NA | | |
| benzo(a)pyrene | | <1.0 | <1.0 | <1.0 | NA | | |
| benzo(b)fluoranthene | | <1.0 | <1.0 | <1.0 | NA | | |
| benzo(k)fluoranthene | | <1.0 | <1.0 | <1.0 | NA | | |
| chrysene | | <1.0 | <1.0 | <1.0 | NA | | |
| acenaphthylene | | <1.0 | <1.0 | <1.0 | NA | | |
| anthracene | | <1.0 | <1.0 | <1.0 | NA | | |
| benzo(ghi)perylene | | <1.0 | <1.0 | <1.0 | NA | | |
| fluorene | | <1.0 | <1.0 | <1.0 | NA | | |
| phenanthrene | | <1.0 | <1.0 | <1.0 | NA | | |
| dibenzo(a,h)anthracene | | <1.0 | <1.0 | <1.0 | NA | | |
| indeno(1,2,3-cd)pyrene | | <1.0 | <1.0 | <1.0 | NA | | |
| pyrene | | <1.0 | <1.0 | <1.0 | NA | | |

Not analyzed due to sample loss in Lab accident.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3854.33

| Parameter | E & E Laboratory No. 86-6239 | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/g) | | | |
| acenaphthene | | <1.0 | 20 | 15 | 75 |
| fluoranthene | | <1.0 | 20 | 14 | 70 |
| naphthalene | | <1.0 | 20 | 13 | 65 |
| benzo(a)anthracene | | <1.0 | 20 | 18 | 90 |
| benzo(a)pyrene | | <1.0 | 20 | 18 | 90 |
| benzo(b)fluoranthene | | <1.0 | 20 | 18 | 90 |
| benzo(k)fluoranthene | | <1.0 | 20 | 18 | 90 |
| chrysene | | <1.0 | 20 | 16 | 80 |
| acenaphthylene | | <1.0 | 20 | 14 | 70 |
| anthracene | | <1.0 | 20 | 15 | 75 |
| benzo(ghi)perylene | | <1.0 | 20 | 18 | 90 |
| fluorene | | <1.0 | 20 | 15 | 75 |
| phenanthrene | | <1.0 | 20 | 14 | 70 |
| dibenzo(a,h)anthracene | | <1.0 | 20 | 18 | 90 |
| indeno(1,2,3-cd)pyrene | | <1.0 | 20 | 17 | 85 |
| pyrene | | <1.0 | 20 | 15 | 75 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3854.34

| Parameter | E & E Laboratory No. 86-6242 | (ug/g) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| acenaphthlene | | <1.0 | <1.0 | -- |
| fluoranthene | | <1.0 | <1.0 | -- |
| naphthalene | | <1.0 | <1.0 | -- |
| benzo(a)anthracene | | <1.0 | <1.0 | -- |
| benzo(a)pyrene | | <1.0 | <1.0 | -- |
| benzo(k)fluoranthene | | <1.0 | <1.0 | -- |
| benzo(k)fluoranthene | | <1.0 | <1.0 | -- |
| chrysene | | <1.0 | <1.0 | -- |
| acenaphthylene | | <1.0 | <1.0 | -- |
| anthracene | | <1.0 | <1.0 | -- |
| benzo(ghi)perylene | | <1.0 | <1.0 | -- |
| fluorene | | <1.0 | <1.0 | -- |
| phenanthrene | | <1.0 | <1.0 | -- |
| dibenzo(a,h)anthracene | | <1.0 | <1.0 | -- |
| ideno(1,2,3-cd)pyrene | | <1.0 | <1.0 | -- |
| pyrene | | <1.0 | <1.0 | -- |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3854.35

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Antimony | 990 | 1112 | 12.3 |
| Beryllium | 960 | 1006 | 4.8 |
| Cadmium | 1300 | 1150 | 11.5 |
| Chromium | 6500 | 6300 | 3.1 |
| Copper | 1030 | 906 | 12.0 |
| Lead | 53.0 | 50.8 | 4.2 |
| Nickel | 1020 | 891 | 12.6 |
| Silver | 6000 | 6152 | 2.5 |
| Thallium | 25.0 | 25.2 | 0.8 |
| Zinc | 1010 | 910 | 9.9 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3854.36

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Petroleum Hydrocarbon | 6265* | 29 | 2200 | 2030 | 91.0 |
| Oil and Grease | 6236 | <100 | 4520 | 4990 | 110 |
| | 6246 | <100 | 4460 | 5120 | 115 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3854.37

| Parameter | E & E Laboratory No. 86- | (mg/kg) Original Analysis | (mg/kg) Replicate Analysis | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| Solids | 6234 | 92 | 92 | 0 |
| | 6242 | 92 | 92 | 0 |
| Flashpoint | 6273* | >140 | >140 | -- |
| Antimony | 6233 | <15 | <15 | -- |
| Beryllium | 6233 | <1 | <1 | -- |
| Cadmium | 6233 | <0.5 | <0.5 | -- |
| Chromium | 6233 | <5 | <5 | -- |
| Copper | 6233 | 2.12 | <2 | -- |
| Lead | 6233 | 2.90 | 3.04 | 4.7 |
| Nickel | 6233 | <10 | <10 | -- |
| Silver | 6233 | <4 | <4 | -- |
| Thallium | 6233 | <20 | <20 | -- |
| Zinc | 6233 | 7.69 | 7.77 | 1.0 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF EP TOXICITY EXTRACTS

U-3854.38

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Arsenic | 6253 | <0.5 | <0.5 | -- |
| Barium | 6253 | <5 | <5 | -- |
| Cadmium | 6253 | <0.1 | <0.1 | -- |
| Chromium | 6253 | <0.5 | <0.5 | -- |
| Lead | 6253 | <0.5 | <0.5 | -- |
| Mercury | 6253 | <0.0008 | <0.0008 | -- |
| Selenium | 6253 | <0.5 | <0.5 | -- |
| Silver | 6253 | <0.5 | <0.5 | -- |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3825

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6043 | 9075 | 0165-SO-004-GS-86-9075 |
| 6044 | 9076 | 0165-SO-004-GS-86-9076 |
| 6045 | 9077 | 0165-SO-004-GS-86-9077 |
| 6046 | 9078 | 0165-SO-004-GS-86-9078 |
| 6047 | 9081 | 0165-SO-004-GS-86-9081 |
| 6048 | 9082 | 0165-SO-004-GS-86-9082 |
| 6049 | 9083 | 0165-SO-004-GS-86-9083 |
| 6050 | 9142 | 0165-SO-004-GS-86-9142 |
| 6051 | 9168 | 0165-SO-004-GS-86-9168 |
| 6052 | 9167 | 0165-SO-004-GS-86-9167 |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3825.1

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| U-3825 | 6043 | 8/1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/29 | 8/5 | -- | -- |
| | 6044 | 8/1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/29 | 8/5 | -- | -- |
| | 6045 | 8/1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/29 | 8/5 | -- | -- |
| | 6046 | 8/1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/29 | 8/5 | -- | -- |
| | 6047 | 8/1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/29 | 8/5 | -- | -- |
| | 6048 | 8/1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/29 | 8/5 | -- | -- |
| | 6049 | 8/1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/29 | 8/5 | -- | -- |
| | 6050 | 8/1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/29 | 8/5 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding Time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3825.2

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3825 | 6043 | 8/1 | 8/15 | 8/5 | 8/8 | 8/7 | 9/6 | 8/8 | 8/8 | 8/6 | 9/15 | 8/7 | 8/8 | 8/6 | 8/15 | 8/7 | -- | -- | -- | -- |
| | 6044 | 8/1 | 8/15 | 8/5 | 8/8 | 8/7 | 9/6 | 8/8 | 8/8 | 8/6 | 9/15 | 8/7 | 8/8 | 8/6 | 8/15 | 8/7 | -- | -- | -- | -- |
| | 6045 | 8/1 | 8/15 | 8/5 | 8/8 | 8/7 | 9/6 | 8/8 | 8/8 | 8/6 | 9/15 | 8/7 | 8/8 | 8/6 | 8/15 | 8/7 | -- | -- | -- | -- |
| | 6046 | 8/1 | 8/15 | 8/5 | 8/8 | 8/7 | 9/6 | 8/8 | 8/8 | 8/6 | 9/15 | 8/7 | 8/8 | 8/6 | 8/15 | 8/7 | -- | -- | -- | -- |
| | 6047 | 8/1 | 8/15 | 8/5 | 8/8 | 8/7 | 9/6 | 8/8 | 8/8 | 8/6 | 9/15 | 8/7 | 8/8 | 8/6 | 8/15 | 8/7 | -- | -- | -- | -- |
| | 6048 | 8/1 | 8/15 | 8/5,6 | 8/8 | 8/7 | 9/6 | 8/8 | 8/8 | 8/6 | 9/15 | 8/7 | 8/8 | 8/6 | 8/15 | 8/7 | -- | -- | -- | -- |
| | 6049 | 8/1 | 8/15 | 8/5,6 | 8/8 | 8/7 | 9/6 | 8/8 | 8/8 | 8/6 | 9/15 | 8/7 | 8/8 | 8/6 | 8/15 | 8/7 | -- | -- | -- | -- |
| | 6050 | 8/1 | 8/15 | 8,5,6 | 8/8 | 8/7 | 9/6 | 8/8 | 8/8 | 8/6 | 9/15 | 8/7 | 8/8 | 8/6 | 8/15 | 8/7 | -- | -- | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): *Holding time expires.*
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

ecology and environment, inc.
International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3825.3

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3825 | | | RE: DF-2000 | | | |
| Sample Date: 8/1/86 | | | P.O. No.: | | | |
| Date Received: 8/2/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6043 | 6044 | 6045 | 6046 | 6047 | 6048 |
| Customer No. | 9075 | 9076 | 9077 | 9078 | 9081 | 9082 |
| Sample Identity | | | | | | |
| | Results in: mg/kg as received | | | | | |
| Oil and Grease | <100 | <100 | <100 | <100 | <100 | <100 |
| Antimony | <15 | <15 | <15 | <15 | <15 | <15 |
| Beryllium | <1 | <1 | <1 | <1 | <1 | <1 |
| Cadmium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chromium | 12.9 | 7.96 | 7.55 | 13.1 | 8.72 | 5.50 |
| Copper | 7.03 | 4.11 | 2.90 | 7.99 | 4.83 | 4.35 |
| Lead | 6.56 | 3.84 | 5.27 | 7.80 | 4.25 | 4.08 |
| Nickel | <10 | <10 | <10 | 12.1 | <10 | <10 |
| Silver | <4 | <4 | <4 | <4 | <4 | <4 |
| Thallium | <20 | <20 | <20 | <20 | <20 | <20 |
| Zinc | 30.1 | 18.7 | 14.7 | 33.8 | 21.9 | 19.5 |
| Solids, % | 93 | 92 | 93 | 94 | 92 | 88 |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn/KDS

Date: August 25, 1986



recycled paper

ecology and environment, inc.
International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3825.4

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3825 | | | RE: DF-2000 | | | |
| Sample Date: 8/1/86 | | | P.O. No.: | | | |
| Date Received: 8/2/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6049 | 6050 | Blank* | | | |
| Customer No. | 9083 | 9142 | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg as received | | | | | |
| Oil and Grease | <100 | <100 | NA | | | |
| Antimony | <15 | <15 | <0.15 | | | |
| Beryllium | <1 | <1 | <0.01 | | | |
| Cadmium | <0.5 | <0.5 | <0.005 | | | |
| Chromium | <5 | <5 | <0.05 | | | |
| Copper | <2 | <2 | <0.02 | | | |
| Lead | 1.77 | 2.57 | <0.005 | | | |
| Nickel | <10 | <10 | <0.1 | | | |
| Silver | <4 | <4 | <0.04 | | | |
| Thallium | <20 | <20 | <0.20 | | | |
| Zinc | 8.29 | 8.49 | <0.05 | | | |
| Solids, % | 76 | 92 | NA | | | |

NA Not applicable.
*: mg/L
+ Elevated detection limits due to matrix interferences.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/ Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]
Date: August 15, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3825.5

| Compound | E & E Lab. No. 86- | Blank | Blank | 6043 | 6044 | 6045 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/5/86 | 8/5/86 | 9075 | 9076 | 9077 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

U-3825.5

| Compound | E & E Lab. No. 86- | 6046 | 6047 | 6048 | 6049 | 6050 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9078 | 9081 | 9082 | 9083 | 9142 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

QUALITY CONTROL DATA ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3825.6

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| 1,2-dichlorobenzene | 6050 | <500 | 1250 | 1237 | 99 |
| 1,3-dichlorobenzene | 6050 | <500 | 1250 | 1174 | 94 |
| 1,4-dichlorobenzene | 6050 | <500 | 1250 | 1198 | 96 |
| toluene | 6050 | <250 | 1250 | 1144 | 92 |
| ethyl benzene | 6050 | <250 | 1250 | 1150 | 92 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3825.7

| Compound | E & E Lab. No. 86- | BLANK | BLANK | BLANK | BLANK | 6043 | 6044 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/5/86 | 8/5/86 | 8/5/86 | 8/6/86 | 9075 | 9076 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | 110 | 210 | 96 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standards preparation and sample extraction, all samples may have been subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3825.8

| Compound | E & E Lab. No. 86- | 6045 | 6046 | 6047 | 6048 | 6049 | 6050 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9077 | 9078 | 9081 | 9082 | 9083 | 9142 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standards preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PESTICIDES, PCBs AND HERBICIDES BY GC
(all results in mg/kg)

U-3825.9

| | E & E Lab. No. 86- | BLANK | 6043 | 6044 | 6045 | 6046 | 6047 | 6048 |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 8/6/86 | 9075 | 9076 | 9077 | 9078 | 9081 | 9082 |
| Aldrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| a-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| b-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| g-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| d-BHC | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Chlordane | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,4'-DDD | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,4'-DDE | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,4'-DDT | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dieldrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan I | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan II | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endosulfan sulfate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endrin | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Endrin aldehyde | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Heptachlor | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Heptachlor epoxide | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1016 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1221 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1232 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1242 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1248 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2.4-D | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,3,5-TP (Silvex) | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4,5,-T | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PESTICIDES, PCBs AND HERBICIDES BY GC
(all results in mg/kg)

U-3825.10

| | E & E Lab. No. 86- | 6049 | 6050 | | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9083 | 9142 | | | | | |
| Aldrin | | <1.0 | <1.0 | | | | | |
| a-BHC | | <1.0 | <1.0 | | | | | |
| b-BHC | | <1.0 | <1.0 | | | | | |
| g-BHC | | <1.0 | <1.0 | | | | | |
| d-BHC | | <1.0 | <1.0 | | | | | |
| Chlordane | | <1.0 | <1.0 | | | | | |
| 4,4'-DDD | | <1.0 | <1.0 | | | | | |
| 4,4'-DDE | | <1.0 | <1.0 | | | | | |
| 4,4'-DDT | | <1.0 | <1.0 | | | | | |
| Dieldrin | | <1.0 | <1.0 | | | | | |
| Endosulfan I | | <1.0 | <1.0 | | | | | |
| Endosulfan II | | <1.0 | <1.0 | | | | | |
| Endosulfan sulfate | | <1.0 | <1.0 | | | | | |
| Endrin | | <1.0 | <1.0 | | | | | |
| Endrin aldehyde | | <1.0 | <1.0 | | | | | |
| Heptachlor | | <1.0 | <1.0 | | | | | |
| Heptachlor epoxide | | <1.0 | <1.0 | | | | | |
| PCB - 1016 | | <1.0 | <1.0 | | | | | |
| PCB - 1221 | | <1.0 | <1.0 | | | | | |
| PCB - 1232 | | <1.0 | <1.0 | | | | | |
| PCB - 1242 | | <1.0 | <1.0 | | | | | |
| PCB - 1248 | | <1.0 | <1.0 | | | | | |
| PCB - 1254 | | <1.0 | <1.0 | | | | | |
| PCB - 1260 | | <1.0 | <1.0 | | | | | |
| Toxaphene | | <1.0 | <1.0 | | | | | |
| 2.4-D | | <1.0 | <1.0 | | | | | |
| 2,3,5-TP (Silvex) | | <1.0 | <1.0 | | | | | |
| 2,4,5,-T | | <1.0 | <1.0 | | | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3825.11

| Compound | E & E Laboratory No. 86-6046 | (mg/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Aldrin | | <1.0 | <1.0 | - |
| a-BHC | | <1.0 | <1.0 | - |
| b-BHC | | <1.0 | <1.0 | - |
| g-BHC | | <1.0 | <1.0 | - |
| d-BHC | | <1.0 | <1.0 | - |
| Chlordane | | <1.0 | <1.0 | - |
| 4,4'-DDD | | <1.0 | <1.0 | - |
| 4,4'-DDE | | <1.0 | <1.0 | - |
| 4,4'-DDT | | <1.0 | <1.0 | - |
| Dieldrin | | <1.0 | <1.0 | - |
| Endosulfan I | | <1.0 | <1.0 | - |
| Endosulfan II | | <1.0 | <1.0 | - |
| Endosulfan sulfate | | <1.0 | <1.0 | - |
| Endrin | | <1.0 | <1.0 | - |
| Endrin aldehyde | | <1.0 | <1.0 | - |
| Heptachlor | | <1.0 | <1.0 | - |
| Heptachlor epoxide | | <1.0 | <1.0 | - |
| PCB - 1016 | | <1.0 | <1.0 | - |
| PCB - 1221 | | <1.0 | <1.0 | - |
| PCB - 1232 | | <1.0 | <1.0 | - |
| PCB - 1242 | | <1.0 | <1.0 | - |
| PCB - 1248 | | <1.0 | <1.0 | - |
| PCB - 1254 | | <1.0 | <1.0 | - |
| PCB - 1260 | | <1.0 | <1.0 | - |
| Toxaphene | | <1.0 | <1.0 | - |
| 2,4-D | | <1.0 | <1.0 | - |
| 2,4,5-TP (Silvex) | | <1.0 | <1.0 | - |
| 2,4,5-T | | <1.0 | <1.0 | - |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3825.12

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/g) | | | |
| 2,4-D | 6046 | <1.0 | 4.0 | 4.3 | 108 |
| Silvex | 6046 | <1.0 | 4.0 | 3.1 | 78 |
| Diazinon | 6046 | <1.0 | 21.1 | 21.4 | 101 |

ecology and environment, inc.
International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3825.13

| | |
|---|---|
| Job No.: U-3825 | RE: DF-2000 |
| Sample Date: 8/1/86 | P.O. No.: |
| Date Received: 8/2/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS AND IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 6051 | 6052 | BLANK | | | | |
| Customer No. | 9168 | 9167 | | | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Barium | <5.0 | <5.0 | <5.0 | | | | 100.0 |
| Cadmium | <0.1 | <0.1 | <0.1 | | | | 1.0 |
| Chromium | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Lead | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Mercury | <0.0008 | <0.0008 | <0.0008 | | | | 0.2 |
| Selenium | <0.5 | <0.5 | <0.5 | | | | 1.0 |
| Silver | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Endrin | NR | NR | NR | | | | 0.02 |
| Lindane | NR | NR | NR | | | | 0.4 |
| Methoxychlor | NR | NR | NR | | | | 10.0 |
| Toxaphene | NR | NR | NR | | | | 0.5 |
| 2,4-D | NR | NR | NR | | | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | NR | | | | 1.0 |
| Ignitability, °F | >140 | >140 | NA | | | | |

NA: Not Applicable NR: Analysis not requested

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn/kas

Date: August 25, 1986



recycled paper

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/g)

U-3825.14

| | E & E Lab. No. 86- | BLANK | 6043 | 6044 | 6045 | 6046 | 6047 | 6048 |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 8/6/86 | 9075 | 9076 | 9077 | 9078 | 9081 | 9082 |
| Naled | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Phorate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Disulfoton | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Chlorpyrifos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Dimethoate | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Malathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Mevinphos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Parathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Methyl parathion | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Diazinon | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Methyl azinphos | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/g)

U-3825.15

| | E & E Lab. No. 86- | 6049 | 6050 | | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9083 | 9142 | | | | | |
| Naled | | <1.0 | <1.0 | | | | | |
| Phorate | | <1.0 | <1.0 | | | | | |
| Disulfoton | | <1.0 | <1.0 | | | | | |
| Chlorpyrifos | | <1.0 | <1.0 | | | | | |
| Dimethoate | | <1.0 | <1.0 | | | | | |
| Malathion | | <1.0 | <1.0 | | | | | |
| Mevinphos | | <1.0 | <1.0 | | | | | |
| Parathion | | <1.0 | <1.0 | | | | | |
| Methyl parathion | | <1.0 | <1.0 | | | | | |
| Diazinon | | <1.0 | <1.0 | | | | | |
| Methyl azinphos | | <1.0 | <1.0 | | | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3825.16

| Parameter | E & E Laboratory No. 86-6046 | (ug/g) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Naled | | <1.0 | <1.0 | - |
| Phorate | | <1.0 | <1.0 | - |
| Disulfoton | | <1.0 | <1.0 | - |
| Chlorpyrifos | | <1.0 | <1.0 | - |
| Dimethoate | | <1.0 | <1.0 | - |
| Malathion | | <1.0 | <1.0 | - |
| Mevinphos | | <1.0 | <1.0 | - |
| Parathion | | <1.0 | <1.0 | - |
| Methyl parathion | | <1.0 | <1.0 | - |
| Diazinon | | <1.0 | <1.0 | - |
| Methyl azinphos | | <1.0 | <1.0 | - |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3825.17

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Antimony | 990 | 1112 | 12.3 |
| Beryllium | 960 | 1006 | 4.8 |
| Cadmium | 940 | 901 | 4.1 |
| Chromium | 1030 | 986 | 4.3 |
| Copper | 1030 | 950 | 7.7 |
| Lead | 53.0 | 49.1 | 7.4 |
| Nickel | 1020 | 954 | 6.5 |
| Silver | 6000 | 6152 | 2.5 |
| Thallium | 25.0 | 24.9 | <0.5 |
| Zinc | 1010 | 980 | 3.0 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3825.18

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 6048 | <100 | 3380 | 3780 | 112 |
| Cadmium* | 6050 | <0.005 | 1.0 | 0.924 | 92.4 |
| Chromium* | 6050 | <0.05 | 1.0 | 0.983 | 98.3 |
| Copper* | 6050 | <0.02 | 1.0 | 0.944 | 94.4 |
| Lead* | 6050 | 0.013 | 0.025 | 0.040 | 108 |
| Nickel* | 6050 | <0.1 | 1.0 | 0.905 | 90.5 |
| Zinc* | 6050 | 0.086 | 1.0 | 1.02 | 93.4 |

* Results in mg/L because spiking is performed during digestion procedure.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3825.19

| Parameter | E & E Laboratory No. 86- | (mg/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Solids, % | 6048 | 88 | 89 | 1.1 |
| Flashpoint | 6173* | >140 | >140 | -- |
| Cadmium | 6050 | <0.5 | <0.5 | -- |
| Chromium | 6050 | <5 | <5 | -- |
| Copper | 6050 | <2 | <2 | -- |
| Lead | 6050 | 2.57 | 3.00 | 15.4 |
| Nickel | 6050 | <10 | <10 | -- |
| Zinc | 6050 | 8.49 | 7.34 | 14.5 |

* This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3826

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6053 | 9079 | 0165-SO-004-GS-86-9079 |
| 6054 | 9080 | 0165-SO-004-GS-86-9080 |
| 6055 | 9090 | 0165-SO-005-GS-86-9090 |
| 6056 | 9091 | 0165-SO-005-GS-86-9091 |
| 6057 | 9092 | 0165-SO-005-GS-86-9092 |
| 6058 | 9169 | 0165-SO-005-GS-86-9169 |
| 6059 | 9170 | 0165-SO-004-GS-86-9170 |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3826.1

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(14/E + 40) | | | | TDS (7) | | G&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| U-3826 | 6053 | 8/2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/30 | 8/6 | -- | -- |
| | 6054 | 8/2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/30 | 8/6 | -- | -- |
| | 6055 | 8/2 | -- | -- | -- | -- | 8/16 | 8/5 | 9/14 | 8/6 | -- | -- | -- | -- | -- | -- |
| | 6056 | 8/2 | -- | -- | -- | -- | 8/16 | 8/5 | 9/14 | 8/6 | -- | -- | -- | -- | -- | -- |
| | 6057 | 8/2 | -- | -- | -- | -- | 8/16 | 8/5 | 9/14 | 8/5 | -- | -- | -- | -- | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

## SAMPLE TRACKING OF ANALYSES REQUIRING HOLDING TIMES

U-3826.2

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| U-3826 | 6053 | 8/2 | 8/16 | 8/6 | 8/9 | 8/7 | 9/6 | 8/8 | 8/9 | 8/6 | 9/5 | 8/12 | 8/9 | 8/6 | 8/16 | 8/7 | -- | -- | -- | -- |
| | 6054 | 8/2 | 8/16 | 8/6 | 8/9 | 8/7 | 9/6 | 8/8 | 8/9 | 8/6 | 9/5 | 8/12 | 8/9 | 8/6 | 8/16 | 8/7 | -- | -- | -- | -- |
| | 6055 | 8/2 | 8/16 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6056 | 8/2 | 8/16 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 6057 | 8/2 | 8/16 | 8/6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | | | | | | | | -- | -- | -- | -- | -- | -- | -- | -- |

H-247

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3826.3

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3826 | | | RE: DF-2000 | | | |
| Sample Date: 8/2/86 | | | P.O. No.: | | | |
| Date Received: 8/4/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6053 | 6054 | 6055 | 6056 | 6057 | Blank* |
| Field Number | 9079 | 9080 | 9090 | 9091 | 9092 | |
| Sample Identity | | | | | | |
| | Results in: mg/kg as received unless noted | | | | | |
| Oil and Grease | <100 | <100 | NR | NR | NR | NA |
| Antimony | <15 | <15 | NR | NR | NR | <0.15 |
| Beryllium | <1 | <1 | NR | NR | NR | <0.01 |
| Cadmium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.005 |
| Chromium | 6.81 | 5.94 | <5 | 7.9 | <5 | <0.05 |
| Copper | 5.37 | 3.16 | NR | NR | NR | <0.02 |
| Lead | 4.38 | 3.25 | 3.72 | 5.60 | 4.11 | 0.013 |
| Nickel | <10 | <10 | <10 | <10 | <10 | <0.1 |
| Silver | <4 | <4 | NR | NR | NR | <0.04 |
| Thallium | <20 | <20 | NR | NR | NR | <0.20 |
| Zinc | 17.4 | 13.5 | 9.69 | 16.1 | 9.05 | <0.05 |
| Solids, % | 90 | 91 | 81 | 78 | 86 | NA |

NR: Analysis not requested
NA: Not applicable
*mg/L
†Elevated detection limit due to matrix interference.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Jay Hicks

Date: August 25, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/g, as received)

U-3826.4

| | E & E Lab. No. 86- | 6053 | 6054 | Blank | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9079 | 9080 | 8/6/86 | | | | |
| Naled | | <1.0 | <1.0 | <1.0 | | | | |
| Phorate | | <1.0 | <1.0 | <1.0 | | | | |
| Disulfoton | | <1.0 | <1.0 | <1.0 | | | | |
| Chlorpyrifos | | <1.0 | <1.0 | <1.0 | | | | |
| Dimethoate | | <1.0 | <1.0 | <1.0 | | | | |
| Malathion | | <1.0 | <1.0 | <1.0 | | | | |
| Mevinphos | | <1.0 | <1.0 | <1.0 | | | | |
| Parathion | | <1.0 | <1.0 | <1.0 | | | | |
| Methyl parathion | | <1.0 | <1.0 | <1.0 | | | | |
| Diazinon | | <1.0 | <1.0 | <1.0 | | | | |
| Methyl azinphos | | <1.0 | <1.0 | <1.0 | | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3826.5

| Compound | E & E Lab. No. 86- | Blank | 6053 | 6054 | 6055 | 6056 | 6057 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/6/86 | 9079 | 9080 | 9090 | 9091 | 9092 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3826.6

| Compound | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| carbon tetrachloride | 6057 | <250 | <250 | -- |
| 1,2-dichloroethane | 6057 | <100 | <100 | -- |
| 1,1,1-trichloroethane | 6057 | <250 | <250 | -- |
| 1,1-dichloroethane | 6057 | <100 | <100 | -- |
| 1,1,2-trichloroethane | 6057 | <500 | <500 | -- |
| 1,1,2,2-tetrachloroethane | 6057 | <250 | <250 | -- |
| chloroethane | 6057 | <500 | <500 | -- |
| 2-chloroethylvinyl ether | 6057 | <5000 | <5000 | -- |
| chloroform | 6057 | <250 | <250 | -- |
| 1,1-dichloroethene | 6057 | <100 | <100 | -- |
| trans-1,2-dichloroethene | 6057 | <100 | <100 | -- |
| 1,2-dichloropropane | 6057 | <1000 | <1000 | -- |
| trans-1,3-dichloropropene | 6057 | <1000 | <1000 | -- |
| cis-1,3-dichloropropene | 6057 | <1000 | <1000 | -- |
| methylene chloride | 6057 | <50 | <50 | -- |
| chloromethane | 6057 | <500 | <500 | -- |
| bromomethane | 6057 | <500 | <500 | -- |
| bromoform | 6057 | <1000 | <1000 | -- |
| bromodichloromethane | 6057 | <250 | <250 | -- |
| fluorotrichloromethane | 6057 | <500 | <500 | -- |
| dichlorodifluoromethane | 6057 | <500 | <500 | -- |
| chlorodibromomethane | 6057 | <250 | <250 | -- |
| tetrachloroethene | 6057 | <250 | <250 | -- |
| trichloroethene | 6057 | <250 | <250 | -- |
| vinyl chloride | 6057 | <500 | <500 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3826.7

| Compound | E & E Lab. No. 86- | Blank | 6053 | 6054 | 6055 | 6056 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/6/86 | 9079 | 9080 | 9090 | 9091 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3826.8

| Compound | E & E Lab. No. 86- | 6057 | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9092 | | | | |
| chlorobenzene | | <250 | | | | |
| 1,2-dichlorobenzene | | <500 | | | | |
| 1,3-dichlorobenzene | | <500 | | | | |
| 1,4-dichlorobenzene | | <500 | | | | |
| benzene | | <250 | | | | |
| total xylenes | | <500 | | | | |
| toluene | | <250 | | | | |
| ethylbenzene | | <250 | | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3826.9

| Parameter | E & E Laboratory No. 86-6057 | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | | <250 | <250 | -- |
| 1,2-dichlorobenzene | | <500 | <500 | -- |
| 1,3-dichlorobenzene | | <500 | <500 | -- |
| 1,4-dichlorobenzene | | <500 | <500 | -- |
| benzene | | <250 | <250 | -- |
| total xylenes | | <500 | <500 | -- |
| toluene | | <250 | <250 | -- |
| ethyl benzene | | <250 | <250 | -- |

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3826.10

| | |
|---|---|
| Job No.: U-3826 | RE: DF-2000 |
| Sample Date: 8/2/86 | P.O. No.: |
| Date Received: 8/4/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS & IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 6058 | 6059 | Blank | | | | |
| Customer No. | 9169 | 9170 | | | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Barium | <5.0 | <5.0 | <5.0 | | | | 100.0 |
| Cadmium | <0.1 | <0.1 | <0.1 | | | | 1.0 |
| Chromium | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Lead | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Mercury | <0.0008 | <0.0008 | <0.0008 | | | | 0.2 |
| Selenium | <0.5 | <0.5 | <0.5 | | | | 1.0 |
| Silver | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Endrin | NR | NR | NR | | | | 0.02 |
| Lindane | NR | NR | NR | | | | 0.4 |
| Methoxychlor | NR | NR | NR | | | | 10.0 |
| Toxaphene | NR | NR | NR | | | | 0.5 |
| 2,4-D | NR | NR | NR | | | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | NR | | | | 1.0 |
| Ignitability, °F | >140 | >140 | NA | | | | |

NA: Not applicable
NR: Analysis not requested

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

H-255

Supervising Analyst: [signature]

Date: September 13, 1986

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PRIORITY POLLUTANT PESTICIDES, PCBs AND HERBICIDES BY GC

(all results in ug/g, as received)

U-3826.11

| | E & E Lab. No. 86- | 6053 | 6054 | Blank | | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9079 | 9080 | 8/6/86 | | | | |
| Aldrin | | <1.0 | <1.0 | <1.0 | | | | |
| a-BHC | | <1.0 | <1.0 | <1.0 | | | | |
| b-BHC | | <1.0 | <1.0 | <1.0 | | | | |
| g-BHC | | <1.0 | <1.0 | <1.0 | | | | |
| d-BHC | | <1.0 | <1.0 | <1.0 | | | | |
| Chlordane | | <1.0 | <1.0 | <1.0 | | | | |
| 4,4'-DDD | | <1.0 | <1.0 | <1.0 | | | | |
| 4,4'-DDE | | <1.0 | <1.0 | <1.0 | | | | |
| 4,4'-DDT | | <1.0 | <1.0 | <1.0 | | | | |
| Dieldrin | | <1.0 | <1.0 | <1.0 | | | | |
| Endosulfan I | | <1.0 | <1.0 | <1.0 | | | | |
| Endosulfan II | | <1.0 | <1.0 | <1.0 | | | | |
| Endosulfan sulfate | | <1.0 | <1.0 | <1.0 | | | | |
| Endrin | | <1.0 | <1.0 | <1.0 | | | | |
| Endrin aldehyde | | <1.0 | <1.0 | <1.0 | | | | |
| Heptachlor | | <1.0 | <1.0 | <1.0 | | | | |
| Heptachlor epoxide | | <1.0 | <1.0 | <1.0 | | | | |
| PCB - 1016 | | <1.0 | <1.0 | <1.0 | | | | |
| PCB - 1221 | | <1.0 | <1.0 | <1.0 | | | | |
| PCB - 1232 | | <1.0 | <1.0 | <1.0 | | | | |
| PCB - 1242 | | <1.0 | <1.0 | <1.0 | | | | |
| PCB - 1248 | | <1.0 | <1.0 | <1.0 | | | | |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | | | | |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | | | | |
| Toxaphene | | <1.0 | <1.0 | <1.0 | | | | |
| 2,4-D | | <1.0 | <1.0 | <1.0 | | | | |
| 2,4,5-TP (Silvex) | | <1.0 | <1.0 | <1.0 | | | | |
| 2,4,5-T | | <1.0 | <1.0 | <1.0 | | | | |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3826.12

| Parameter | E & E Laboratory No. 86-6054 | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/g) | | | |
| Aldrin | | <1 | 2.0 | 1.76 | 88.2 |
| a-BHC | | <1 | 2.0 | 1.89 | 94.6 |
| b-BHC | | <1 | 2.0 | 1.99 | 99.7 |
| g-BHC | | <1 | 2.0 | 1.94 | 96.8 |
| d-BHC | | <1 | 2.0 | 1.99 | 99.6 |
| 4,4'-DDT | | <1 | 2.0 | 1.57 | 78.5 |
| Endosulfan sulfate | | <1 | 2.0 | 2.72 | 136 |
| Endrin | | <1 | 2.0 | 2.02 | 101 |
| Endrin aldehyde | | <1 | 2.0 | 1.70 | 84.9 |
| Heptachlor | | <1 | 2.0 | 2.14 | 107 |
| Heptachlor epoxide | | <1 | 2.0 | 1.84 | 92.2 |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOILS ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3826.13

| Compound | E & E Lab. No. 86- | 6055 | 6056 | 6057 | Method Blank | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9090 | 9091 | 9092 | ug/L | |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <10 | |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <10 | |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <10 | |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <10 | |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <10 | |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <10 | |
| hexachloroethane | | <1 | <1 | <1 | <10 | |
| nitrobenzene | | <1 | <1 | <1 | <10 | |
| isophorone | | <1 | <1 | <1 | <10 | |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <10 | |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <10 | |
| naphthalene | | <1 | <1 | <1 | <10 | |
| hexachlorobutadiene | | <1 | <1 | <1 | <10 | |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <10 | |
| 2-chloronaphthalene | | <1 | <1 | <1 | <10 | |
| dimethyl phthalate | | <1 | <1 | <1 | <10 | |
| acenaphthylene | | <1 | <1 | <1 | <10 | |
| fluorene | | <1 | <1 | <1 | <10 | |
| acenaphthene | | <1 | <1 | <1 | <10 | |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <10 | |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <10 | |
| diethylphthalate | | <1 | <1 | <1 | <10 | |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <10 | |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <10 | |
| 4-bromophenyl phenyl ether | | <1 | <1 | <1 | <10 | |
| hexachlorobenzene | | <1 | <1 | <1 | <10 | |
| phenanthrene | | <1 | <1 | <1 | <10 | |
| anthracene | | <1 | <1 | <1 | <10 | |
| di-n-butyl phthalate | | <1 | <1 | <1 | <10 | |
| fluoranthene | | <1 | <1 | <1 | <10 | |
| benzidine | | <5 | <5 | <5 | <50 | |
| pyrene | | <1 | <1 | <1 | <10 | |
| butyl benzyl phthalate | | <1 | <1 | <1 | <10 | |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <30 | |
| benzo(a)anthracene | | <1 | <1 | <1 | <10 | |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | <1 | <10 | |
| chrysene | | <1 | <1 | <1 | <10 | |
| di-n-octyl phthalate | | <1 | <1 | <1 | <10 | |
| benzo(b)fluoranthene | | <1 | <1 | <1 | <10 | |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <10 | |
| benzo(a)pyrene | | <1 | <1 | <1 | <10 | |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <10 | |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <10 | |
| benzo(ghi)perylene | | <1 | <1 | <1 | <10 | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PHENOLS BY GC
(all results in mg/kg, as received)

U-3826.14

| Compound | E & E Lab. No. 86- | 6055 | 6056 | 6057 | Method Blank | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9090 | 9091 | 9092 | ug/L | |
| phenol | | <1 | <1 | <1 | <10 | |
| 2-chlorophenol | | <1 | <1 | <1 | <10 | |
| 2-nitrophenol | | <1 | <1 | <1 | <10 | |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <10 | |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <10 | |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <10 | |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <10 | |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <30 | |
| 4-nitrophenol | | <1 | <1 | <1 | <10 | |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <30 | |
| pentachlorophenol | | <3 | <3 | <3 | <30 | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3826.15

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| Nitrobenzene-D5 | 6055 | 3.3 | 2.3 | 69.7 |
| | 6056 | 3.3 | 2.1 | 63.6 |
| | 6057 | 3.3 | 2.1 | 63.6 |
| 2-Fluorobiphenyl | 6055 | 3.3 | 2.7 | 81.8 |
| | 6056 | 3.3 | 2.9 | 87.9 |
| | 6057 | 3.3 | 2.8 | 84.8 |
| Terphenyl-D14 | 6055 | 3.3 | 2.4 | 72.7 |
| | 6056 | 3.3 | 2.4 | 72.7 |
| | 6057 | 3.3 | 2.1 | 63.6 |
| Phenol-D5 | 6055 | 6.6 | 2.7 | 40.9 |
| | 6056 | 6.6 | 1.9 | 28.8 |
| | 6057 | 6.6 | 2.4 | 36.4 |
| 2-Fluorophenol | 6055 | 6.6 | 2.3 | 34.8 |
| | 6056 | 6.6 | 2.5 | 37.9 |
| | 6057 | 6.6 | 2.6 | 39.4 |
| 2,4,6-Tribromophenol | 6055 | 6.6 | 2.5 | 37.8 |
| | 6056 | 6.6 | 1.9 | 28.8 |
| | 6057 | 6.6 | 2.3 | 34.8 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3826.16

| Compound | E & E Lab. No. 86-6056 | mg/kg | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| bis(2-chloroethyl)ether | | <1 | <1 | -- |
| 1,3-dichlorobenzene | | <1 | <1 | -- |
| 1,4-dichlorobenzene | | <1 | <1 | -- |
| 1,2-dichlorobenzene | | <1 | <1 | -- |
| bis(2-chloroisopropyl)ether | | <1 | <1 | -- |
| N-nitrosodipropylamine | | <1 | <1 | -- |
| hexachloroethane | | <1 | <1 | -- |
| nitrobenzene | | <1 | <1 | -- |
| isophorone | | <1 | <1 | -- |
| bis(2-chloroethoxy)methane | | <1 | <1 | -- |
| 1,2,4-trichlorobenzene | | <1 | <1 | -- |
| naphthalene | | <1 | <1 | -- |
| hexachlorobutadiene | | <1 | <1 | -- |
| hexachlorocyclopentadiene | | <1 | <1 | -- |
| 2-chloronaphthalene | | <1 | <1 | -- |
| dimethyl phthalate | | <1 | <1 | -- |
| acenaphthylene | | <1 | <1 | -- |
| fluorene | | <1 | <1 | -- |
| acenaphthene | | <1 | <1 | -- |
| 2,4-dinitrotoluene | | <1 | <1 | -- |
| 2,6-dinitrotoluene | | <1 | <1 | -- |
| diethylphthalate | | <1 | <1 | -- |
| 4-chlorophenyl phenyl ether | | <1 | <1 | -- |
| N-nitrosodiphenylamine | | <1 | <1 | -- |
| 4-bromophenyl phenyl ether | | <1 | <1 | -- |
| hexachlorobenzene | | <1 | <1 | -- |
| phenanthrene | | <1 | <1 | -- |
| anthracene | | <1 | <1 | -- |
| di-n-butyl phthalate | | <1 | <1 | -- |
| fluoranthene | | <1 | <1 | -- |
| benzidine | | <5 | <5 | -- |
| pyrene | | <1 | <1 | -- |
| butyl benzyl phthalate | | <1 | <1 | -- |
| 3,3'-dichlorobenzidine | | <3 | <3 | -- |
| benzo(a)anthracene | | <1 | <1 | -- |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | -- |
| chrysene | | <1 | <1 | -- |
| di-n-octyl phthalate | | <1 | <1 | -- |
| benzo(b)fluoranthene | | <1 | <1 | -- |
| benzo(k)fluoranthene | | <1 | <1 | -- |
| benzo(a)pyrene | | <1 | <1 | -- |
| indeno(1,2,3-c,d)pyrene | | <1 | <1 | -- |
| dibenzo(a,h)anthracene | | <1 | <1 | -- |
| benzo(g,h,i)perylene | | <1 | <1 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3826.17

| Compound | E & E Lab. No. 86-6056 | mg/kg | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| phenol | | <1 | <1 | -- |
| 2-chlorophenol | | <1 | <1 | -- |
| 2-nitrophenol | | <1 | <1 | -- |
| 2,4-dimethylphenol | | <1 | <1 | -- |
| 2,4-dichlorophenol | | <1 | <1 | -- |
| 4-chloro-3-methylphenol | | <1 | <1 | -- |
| 2,4,6-trichlorophenol | | <1 | <1 | -- |
| 2,4-dinitrophenol | | <3 | <3 | -- |
| 4-nitrophenol | | <1 | <1 | -- |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | -- |
| pentachlorophenol | | <3 | <3 | -- |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3826.18

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Antimony | 990 | 1112 | 12.3 |
| Beryllium | 960 | 1006 | 4.8 |
| Cadmium | 1300 | 1200 | 7.7 |
| Chromium | 6500 | 6262 | 3.7 |
| Copper | 1030 | 943 | 8.4 |
| Lead | 53.0 | 50.4 | 4.9 |
| Nickel | 1020 | 940 | 7.8 |
| Silver | 6000 | 6152 | 2.5 |
| Thallium | 25.0 | 25.2 | 0.8 |
| Zinc | 1010<br>1010 | 1000<br>1040 | 1.0<br>3.0 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3826.19

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 6053 | <100 | 3840 | 4620 | 120 |
| Lead* | 6054 | 0.033 | 0.025 | 0.056 | 92.0 |

*Results in mg/L because spiking done during digestion procedure.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3826.20

| Parameter | E & E Laboratory No. 86- | (mg/kg) Original Analysis | (mg/kg) Replicate Analysis | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| Solids | 6054 | 91 | 91 | 0 |
| Flashpoint | 6173* | >140 | >140 | -- |
| Antimony | 6057 | <15 | <15 | -- |
| Beryllium | 6057 | <1 | <1 | -- |
| Cadmium | 6057 | <0.5 | <0.5 | -- |
| Chromium | 6057 | <5 | <5 | -- |
| Lead | 6057 | 4.11 | 4.18 | 1.7 |
| Nickel | 6057 | <10 | <10 | -- |
| Silver | 6057 | <4 | <4 | -- |
| Thallium | 6057 | <20 | <20 | -- |
| Zinc | 6057 | 9.05 | 7.67 | 16.5 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3905.17

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6827 | 9027 | 0165-SO-002-GS-86-9027 |
| 6828 | 9028 | 0165-SO-002-GS-86-9028 |
| 6829 | 9049 | 0165-SO-006-GS-86-9049 |
| 6830 | 9050 | 0165-SO-006-GS-86-9050 |
| 6831 | 9051 | 0165-SO-006-GS-86-9051 |
| 6832 | 9052 | 0165-SO-006-GS-86-9052 |
| 6833 | 9053 | 0165-SO-006-GS-86-9053 |
| 6834 | 9054 | 0165-SO-006-GS-86-9054 |
| 6835 | 9055 | 0165-SO-006-GS-86-9055 |
| 6836 | 9144 | 0165-SO-006-GS-86-9144 |
| 6837 | 9179 | 0165-SO-006-GS-86-9179 |
| 6838 | 9180 | 0165-SO-006-GS-86-9180 |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3905.15

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3905 | 6827 | 8/11 | 8/25 | 8/13,15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6828 | 8/11 | 8/25 | 8/13,15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6829 | 8/11 | 8/25 | 8/13,18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6830 | 8/11 | 8/25 | 8/13,15 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6831 | 8/11 | 8/25 | 8/13,18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6832 | 8/11 | 8/25 | 8/13,18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6833 | 8/11 | 8/25 | 8/13,18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6834 | 8/11 | 8/25 | 8/13,18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6835 | 8/11 | 8/25 | 8/13,18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |
| | 6836 | 8/11 | 8/25 | 8/13,18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/18 | 8/14 | 9/13 | 8/18 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3905.16

| Job | Sample Number | Sample Date | PAH (7/S + 30) Extraction Dead | PAH (7/S + 30) Extraction Extr | PAH (7/S + 30) Analysis Dead | PAH (7/S + 30) Analysis Anal | BNA(7/E + 40) Extraction Dead | BNA(7/E + 40) Extraction Extr | BNA(7/E + 40) Analysis Dead | BNA(7/E + 40) Analysis Anal | IDS (7) Dead | IDS (7) Anal | O&G(28) Dead | O&G(28) Anal | Pet. HC(28) Dead | Pet. HC(28) Anal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3905 | 6827 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6828 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6829 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6830 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6831 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6832 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6833 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6834 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6835 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |
| | 6836 | 8/11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/8 | 8/19 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3905

| Compound | E & E Lab. No. 86- | BLANK | BLANK | 6827 | 6828 | 6829 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8-13-86 | 8-13-86 | 9027 | 9028 | 9049 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3905.1

| Compound | E & E Lab. No. 86- | 6830 | 6831 | 6832 | 6833 | 6834 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9050 | 9051 | 9052 | 9053 | 9054 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3905.2

| Compound | E & E Lab. No. 86- | 6835 | 6836 | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9055 | 9144 | | | |
| chlorobenzene | | <250 | <250 | | | |
| 1,2-dichlorobenzene | | <500 | <500 | | | |
| 1,3-dichlorobenzene | | <500 | <500 | | | |
| 1,4-dichlorobenzene | | <500 | <500 | | | |
| benzene | | <250 | <250 | | | |
| total xylenes | | <500 | <500 | | | |
| toluene | | <250 | <250 | | | |
| ethylbenzene | | <250 | <250 | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3905.3

| Parameter | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | 6833 | <250 | <250 | -- |
| 1,2-dichlorobenzene | 6833 | <500 | <500 | -- |
| 1,3-dichlorobenzene | 6833 | <500 | <500 | -- |
| 1,4-dichlorobenzene | 6833 | <500 | <500 | -- |
| benzene | 6833 | <250 | <250 | -- |
| total xylenes | 6833 | <500 | <500 | -- |
| toluene | 6833 | <250 | <250 | -- |
| ethyl benzene | 6833 | <250 | <250 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3905.4

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| 1,2-dichlorobenzene | 6836 | <500 | 1250 | 1250 | 100 |
| 1,3-dichlorobenzene | 6836 | <500 | 1250 | 1206 | 97 |
| 1,4-dichlorobenzene | 6836 | <500 | 1250 | 1222 | 98 |
| toluene | 6836 | <250 | 1250 | 1163 | 93 |
| ethyl benzene | 6836 | <250 | 1250 | 1167 | 93 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3905.5

| Compound | E & E Lab. No. 86- | BLANK | BLANK | 6827 | 6828 | 6829 | 6830 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/15/86 | 8/18/86 | 9027 | 9028 | 9049 | 9050 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | 910 | 510 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3905.6

| Compound | E & E Lab. No. 86- | 6831 | 6832 | 6833 | 6834 | 6835 | 6836 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9051 | 9052 | 9053 | 9054 | 9055 | 9144 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3905.7

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| carbon tetrachloride | 6836 | <250 | 1,250 | 1462 | 117 |
| 1,2-dichloroethane | 6836 | <100 | 1,250 | 1300 | 104 |
| 1,1,1-trichloroethane | 6836 | <250 | 1,250 | 1362 | 109 |
| 1,1-dichloroethane | 6836 | <100 | 1,250 | 1438 | 115 |
| chloroethane | 6836 | <500 | 1,250 | 1408 | 113 |
| chloroform | 6836 | <250 | 1,250 | 1400 | 112 |
| trans-1,2-dichloroethene | 6836 | <100 | 1,250 | 1488 | 119 |
| methylene chloride | 6836 | <50 | 1,250 | 1416 | 113 |
| chloromethane | 6836 | <500 | 1,250 | 1351 | 108 |
| bromomethane | 6836 | <500 | 1,250 | 1430 | 114 |
| bromoform | 6836 | <1000 | 1,250 | 1172 | 93.8 |
| bromodichloromethane | 6836 | <250 | 1,250 | 1400 | 112 |
| trichloroethene | 6836 | <250 | 1,250 | 1312 | 105 |

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PHENOLS BY GC

(all results in ug/g as received)

U-3905.8

| Compound | E & E Lab. No. 86- | BLANK | 6827 | 6828 | 6829 | 6830 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/14/86 | 9027 | 9028 | 9049 | 9050 |
| phenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-chlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dimethylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4-chloro-3-methylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4,6-trichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4-nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-methyl-4,6-dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| pentachlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PHENOLS BY GC

(all results in ug/g as received)

U-3905.9

| Compound | E & E Lab. No. 86- | 6831 | 6832 | 6833 | 6834 | 6835 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9051 | 9052 | 9053 | 9054 | 9055 |
| phenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-chlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dimethylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4-chloro-3-methylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4,6-trichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4-nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-methyl-4,6-dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| pentachlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3905.10

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/g) | | | |
| 4-Chloro-3-Methylphenol | 6831 | <1.0 | 20 | 12 | 60 |
| 2-Chlorophenol | 6831 | <1.0 | 20 | 13 | 65 |
| 2,4-Dichlorophenol | 6831 | <1.0 | 20 | 12 | 60 |
| 2,4-Dimethylphenol | 6831 | <1.0 | 20 | 12 | 60 |
| 2-methyl-4,6-Dinitrophenol | 6831 | <1.0 | 20 | 9.0 | 45 |
| 2-Nitrophenol | 6831 | <1.0 | 20 | 12 | 60 |
| 4-Nitrophenol | 6831 | <1.0 | 20 | 13 | 65 |
| Pentachlorophenol | 6831 | <1.0 | 20 | 8.0 | 40 |
| Phenol | 6831 | <1.0 | 20 | 13 | 65 |
| 2,4,6-Trichlorophenol | 6831 | <1.0 | 20 | 15 | 75 |

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3905.11

| | |
|---|---|
| Job No.: U-3905 | RE: DF-2000 |
| Sample Date: 8/11/86 | P.O. No.: |
| Date Received: 8/12/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS AND IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 6837 | 6838 | BLANK | | | | |
| Customer No. | 9179 | 9180 | | | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | <0.5 | | | | |
| Barium | <5.0 | <5.0 | <5.0 | | | | 100.0 |
| Cadmium | <0.1 | <0.1 | <0.1 | | | | 1.0 |
| Chromium | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Lead | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Mercury | <0.0008 | <0.0008 | <0.0008 | | | | 0.2 |
| Selenium | <0.5 | <0.5 | <0.5 | | | | 1.0 |
| Silver | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Endrin | NR | NR | NR | | | | 0.02 |
| Lindane | NR | NR | NR | | | | 0.4 |
| Methoxychlor | NR | NR | NR | | | | 10.0 |
| Toxaphene | NR | NR | NR | | | | 0.5 |
| 2,4-D | NR | NR | NR | | | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | NR | | | | 1.0 |
| Ignitability, °F | >140 | >140 | NA | | | | |

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: September 19, 1986

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3905.12

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3905 | | | RE: DF-2000 | | | |
| Sample Date: 8/11/86 | | | P.O. No.: E & E, Inc. | | | |
| Date Received: 8/12/86 | | | Sampled By: | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6827 | 6828 | 6829 | 6830 | 6831 | 6832 |
| Customer No. | 9027 | 9028 | 9049 | 9050 | 9051 | 9052 |
| Sample Identity | | | | | | |
| | Results in: mg/kg† unless noted | | | | | |
| Oil and Grease | <100 | <100 | <100 | 140 | <100 | <100 |
| Chromium | 16 | 15.3 | 10.1 | 7.14 | 41.7 | 64.6 |
| Lead | 8.23 | 8.12 | 6.46 | 5.02 | 2.74 | 3.24 |
| Solids, % | 74 | 71 | 92 | 88 | 87 | 90 |

†: as received

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: September 17, 1986

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3905.13

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3905 | | | RE: DF-2000 | | | |
| Sample Date: 8/11/86 | | | P.O. No.: E & E, Inc. | | | |
| Date Received: 8/12/86 | | | Sampled By: | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6833 | 6834 | 6835 | 6836 | BLANK* | |
| Customer No. | 9053 | 9054 | 9055 | 9144 | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg† unless noted | | | | | |
| Oil and Grease | 180 | 160 | <100 | <100 | NA | |
| Chromium | 10.5 | <5 | <5 | 7.88 | <0.05 | |
| Lead | 6.81 | 2.63 | 3.23 | 4.96 | <0.005 | |
| Solids, % | 94 | 90 | 91 | 89 | NA | |

†: as received
*: mg/L
NA: Not Applicable

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]
Date: September 17, 1986

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3905.14

| Parameter | E & E Laboratory No. 86- | (ug/g) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| 4-Chloro-3-Methylphenol | 6832 | <1.0 | <1.0 | -- |
| 2-Chlorophenol | 6832 | <1.0 | <1.0 | -- |
| 2,4-Dichlorophenol | 6832 | <1.0 | <1.0 | -- |
| 2,4-Dimethylphenol | 6832 | <1.0 | <1.0 | -- |
| 2,4-Dinitrophenol | 6832 | <1.0 | <1.0 | -- |
| 2-Methyl-4,6-Dinitrophenol | 6832 | <1.0 | <1.0 | -- |
| 2-Nitrophenol | 6832 | <1.0 | <1.0 | -- |
| 4-Nitrophenol | 6832 | <1.0 | <1.0 | -- |
| Pentachlorophenol | 6832 | <1.0 | <1.0 | -- |
| Phenol | 6832 | <1.0 | <1.0 | -- |
| 2,4,6-Trichlorophenol | 6832 | <1.0 | <1.0 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3905.18

| Parameter | E & E Laboratory No. 86- | (mg/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Solids % | 6836 | 89 | 87 | 2.3 |
| Flashpoint, °F | 7024* | >140 | >140 | -- |
| Chromium | 6836 | 7.88 | 5.33 | 38.6 |
| Lead | 6836 | 4.96 | 4.72 | 50 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3905.19

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 6836 | <100 | 4450 | 5100 | 115 |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3905.20

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Arsenic | 46.0 | 50.9 | 10.6 |
| Barium | 119,600 | 118,600 | 0.8 |
| Cadmium | 940 | 904 | 3.8 |
| Chromium | 1030 | 1010 | 1.9 |
| Lead | 1010<br>53.0 | 997<br>55.6 | 1.3<br>4.9 |
| Mercury | 4.4 | 4.46 | 1.4 |
| Selenium | 7.90 | 8.40 | 6.3 |
| Silver | 6000 | 6500 | 8.3 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF EP TOXICITY EXTRACTS

U-3905.21

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Arsenic | 6838 | <0.5 | <0.5 | -- |
| Barium | 6838 | <5 | <5 | -- |
| Cadmium | 6838 | <0.1 | <0.1 | -- |
| Chromium | 6838 | <0.5 | <0.5 | -- |
| Lead | 6838 | <0.5 | <0.5 | -- |
| Mercury | 6838 | <0.0008 | <0.0008 | -- |
| Selenium | 6838 | <0.5 | <0.5 | -- |
| Silver | 6838 | <0.5 | <0.5 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PHENOLS BY GC

(all results in ug/g as received)

U-3905.22

| Compound | E & E Lab. No. 86- | 6836 | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9144 | | | | |
| phenol | | <1.0 | | | | |
| 2-chlorophenol | | <1.0 | | | | |
| 2-nitrophenol | | <1.0 | | | | |
| 2,4-dimethylphenol | | <1.0 | | | | |
| 2,4-dichlorophenol | | <1.0 | | | | |
| 4-chloro-3-methylphenol | | <1.0 | | | | |
| 2,4,6-trichlorophenol | | <1.0 | | | | |
| 2,4-dinitrophenol | | <1.0 | | | | |
| 4-nitrophenol | | <1.0 | | | | |
| 2-methyl-4,6-dinitrophenol | | <1.0 | | | | |
| pentachlorophenol | | <1.0 | | | | |

*Compound present below measurable detection limit.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3911

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 6871 | 9105 | 0165-SO-008-GS-86-9105 |
| 6872 | 9106 | 0165-SO-008-GS-86-9106 |
| 6873 | 9107 | 0165-SO-008-GS-86-9107 |
| 6874 | 9108 | 0165-SO-008-GS-86-9018 |
| 6875 | 9109 | 0165-SO-008-GS-86-9109 |
| 6876 | 9110 | 0165-SO-008-GS-86-9110 |
| 6877 | 9139 | 0165-SO-008-GS-86-9139 |
| 6878 | 9181 | 0165-SO-008-GS-86-9181 |
| 6879 | 9182 | 0165-SO-008-GS-86-9182 |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3911.15

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3911 | 6871 | 8/12 | 8/26 | 8/13,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/19 | 8/14 | 9/13 | 8/19 |
| | 6872 | 8/12 | 8/26 | 8/13,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/19 | 8/14 | 9/13 | 8/19 |
| | 6873 | 8/12 | 8/26 | 8/13,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/19 | 8/14 | 9/13 | 8/19 |
| | 6874 | 8/12 | 8/26 | 8/13,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/19 | 8/14 | 9/13 | 8/19 |
| | 6875 | 8/12 | 8/26 | 8/14,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/19 | 8/14 | 9/13 | 8/19 |
| | 6876 | 8/12 | 8/26 | 8/14,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/19 | 8/14 | 9/13 | 8/20 |
| | 6877 | 8/12 | 8/26 | 8/14,19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/19 | 8/14 | 9/13 | 8/20 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3911.16

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3911 | 6871 | 8/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/9 | 8/21 | -- | -- |
| | 6872 | 8/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/9 | 8/21 | -- | -- |
| | 6873 | 8/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/9 | 8/21 | -- | -- |
| | 6874 | 8/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/9 | 8/21 | -- | -- |
| | 6875 | 8/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/9 | 8/21 | -- | -- |
| | 6876 | 8/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/9 | 8/21 | -- | -- |
| | 6877 | 8/12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9/9 | 8/21 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3911.1

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3911 | | | RE: DF-2000 | | | |
| Sample Date: 8/12/86 | | | P.O. No.: | | | |
| Date Received: 8/13/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6871 | 6872 | 6873 | 6874 | 6875 | 6876 |
| Customer No. | 9105 | 9106 | 9107 | 9108 | 9109 | 9110 |
| Sample Identity | | | | | | |
| | Results in: mg/kg, as received unless noted | | | | | |
| Oil and Grease | <100 | <100 | <100 | <100 | <100 | <100 |
| Arsenic | <2.7† | 6.52 | <2.7† | <2.7† | 3.33 | 1.95 |
| Solids, % | 75 | 84 | 88 | 88 | 91 | 92 |

†Elevated detection limits due to matrix interferences.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn 11/6

Date: September 23, 1986

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3911.2

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3911 | | | RE: DF-2000 | | | |
| Sample Date: 8/12/86 | | | P.O. No.: | | | |
| Date Received: 8/13/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 6877 | Blank* | | | | |
| Customer No. | 9139 | | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/kg, as received unless noted | | | | | |
| Oil and Grease | <100 | NA | | | | |
| Arsenic | 2.66 | <0.005 | | | | |
| Solids, % | 87 | NA | | | | |

NA: Not Applicable
*mg/L

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn/KOS

Date: September 13, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3911.3

| Compound | E & E Lab. No. 86- | Blank | Blank | 6871 | 6872 | 6873 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/13/86 | 8/14/86 | 9105 | 9106 | 9107 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3911.4

| Compound | E & E Lab. No. 86- | 6874 | 6875 | 6876 | 6877 | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9108 | 9109 | 9110 | 9139 | |
| chlorobenzene | | <250 | <250 | <250 | <250 | |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | |
| benzene | | <250 | <250 | <250 | <250 | |
| total xylenes | | <500 | <500 | <500 | <500 | |
| toluene | | <250 | <250 | <250 | <250 | |
| ethylbenzene | | <250 | <250 | <250 | <250 | |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3911.5

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| 1,2-dichlorobenzene | 6877 | <500 | 1250 | 1185 | 95 |
| 1,3-dichlorobenzene | 6877 | <500 | 1250 | 1185 | 95 |
| 1,4-dichlorobenzene | 6877 | <500 | 1250 | 1176 | 94 |
| toluene | 6877 | <250 | 1250 | 1167 | 93 |
| ethyl benzene | 6877 | <250 | 1250 | 1174 | 94 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3911.6

| Compound | E & E Lab. No. 86- | Blank | 6871 | 6872 | 6873 | 6874 | 6875 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/19/86 | 9105 | 9106 | 9107 | 9108 | 9109 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | 180 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg, as received)

U-3911.7

| Compound | E & E Lab. No. 86- | 6876 | 6877 | | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9110 | 9139 | | | | |
| carbon tetrachloride | | <250 | <250 | | | | |
| 1,2-dichloroethane | | <100 | <100 | | | | |
| 1,1,1-trichloroethane | | <250 | <250 | | | | |
| 1,1-dichloroethane | | <100 | <100 | | | | |
| 1,1,2-trichloroethane | | <500 | <500 | | | | |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | | | | |
| chloroethane | | <500 | <500 | | | | |
| 2-chloroethylvinyl ether | | <5000 | <5000 | | | | |
| chloroform | | <250 | <250 | | | | |
| 1,1-dichloroethene | | <100 | <100 | | | | |
| trans-1,2-dichloroethene | | <100 | <100 | | | | |
| 1,2-dichloropropane | | <1000 | <1000 | | | | |
| trans-1,3-dichloropropene | | <1000 | <1000 | | | | |
| cis-1,3-dichloropropene | | <1000 | <1000 | | | | |
| methylene chloride | | <50 | <50 | | | | |
| chloromethane | | <500 | <500 | | | | |
| bromomethane | | <500 | <500 | | | | |
| bromoform | | <1000 | <1000 | | | | |
| bromodichloromethane | | <250 | <250 | | | | |
| fluorotrichloromethane | | <500 | <500 | | | | |
| dichlorodifluoromethane | | <500 | <500 | | | | |
| chlorodibromomethane | | <250 | <250 | | | | |
| tetrachloroethene | | <250 | <250 | | | | |
| trichloroethene | | <250 | <250 | | | | |
| vinyl chloride | | <500 | <500 | | | | |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation and sample extraction, all samples have been blank subtracted. The actual value of the blank has been reported.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3911.8

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| carbon tetrachloride | 6877 | <250 | 1250 | 1375 | 110 |
| 1,2-dichloroethane | 6877 | <100 | 1250 | 1375 | 110 |
| 1,1,1-trichloroethane | 6877 | <250 | 1250 | 1400 | 112 |
| 1,1-dichloroethane | 6877 | <100 | 1250 | 1450 | 116 |
| chloroethane | 6877 | <500 | 1250 | 1134 | 90.7 |
| chloroform | 6877 | <250 | 1250 | 1388 | 111 |
| trans-1,2-dichloroethene | 6877 | <100 | 1250 | 1400 | 112 |
| methylene chloride | 6877 | <50 | 1250 | 571.2 | 45.7 |
| chloromethane | 6877 | <500 | 1250 | 1206 | 96.5 |
| bromomethane | 6877 | <500 | 1250 | 1175 | 94.0 |
| bromoform | 6877 | <1000 | 1250 | 1250 | 100 |
| bromodichloromethane | 6877 | <250 | 1250 | 1425 | 114 |
| trichloroethene | 6877 | <250 | 1250 | 1788 | 143 |

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3911.9

| | |
|---|---|
| Job No.: U-3911 | RE: DF-2000 |
| Sample Date: 8/12/86 | P.O. No.: |
| Date Received: 8/13/86 | Sampled By: E & E, Inc. |
| Sample Type: Soil | Delivered By: Federal Express |

RESULTS OF CHEMICAL ANALYSIS OF EXTRACTS FROM EP TOXICITY TESTS AND IGNITABILITY

| | mg/L | | | | | | Maximum Allowable Concentration (mg/L) |
|---|---|---|---|---|---|---|---|
| E & E Lab. No. 86- | 6878 | 6879 | Blank | | | | |
| Customer No. | 9181 | 9182 | | | | | |
| Sample Identity | | | | | | | |
| Arsenic | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Barium | <5.0 | <5.0 | <5.0 | | | | 100.0 |
| Cadmium | <0.1 | <0.1 | <0.1 | | | | 1.0 |
| Chromium | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Lead | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Mercury | <0.0008 | <0.0008 | <0.0008 | | | | 0.2 |
| Selenium | <0.5 | <0.5 | <0.5 | | | | 1.0 |
| Silver | <0.5 | <0.5 | <0.5 | | | | 5.0 |
| Endrin | NR | NR | NR | | | | 0.02 |
| Lindane | NR | NR | NR | | | | 0.4 |
| Methoxychlor | NR | NR | NR | | | | 10.0 |
| Toxaphene | NR | NR | NR | | | | 0.5 |
| 2,4-D | NR | NR | NR | | | | 10.0 |
| 2,4,5-TP (Silvex) | NR | NR | NR | | | | 1.0 |
| Ignitability, °F | >140 | >140 | NA | | | | |

NR: Not Requested
NA: Not Applicable

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]
Date: September 23, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PHENOLS BY GC

(all results in ug/g, as received)

U-3911.10

| Compound | E & E Lab. No. 86- | Blank | 6871 | 6872 | 6873 | 6874 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/14/86 | 9105 | 9106 | 9107 | 9108 |
| phenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-chlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2-nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dimethylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4-chloro-3-methylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4,6-trichlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 2,4-dinitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4-nitrophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| 4,6-dinitro-2-methylphenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| pentachlorophenol | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3911.11

| Parameter | E & E Laboratory No. 86- | (mg/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Solids | 6875 | 90 | 91 | 1.1 |
| Arsenic | 6877 | 2.66 | <2.7 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3911.12

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 6877 | <100 | 3520 | 3840 | 109 |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3911.13

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Arsenic | 46.0 | 45.3 | 1.5 |
| Barium | 119,600 | 118,600 | 0.8 |
| Cadmium | 940 | 904 | 3.8 |
| Chromium | 1030 | 1010 | 1.9 |
| Lead | 1010 | 997 | 1.3 |
| Mercury | 4.4 | 4.46 | 1.4 |
| Selenium | 7.90 | 8.40 | 6.3 |
| Silver | 6000 | 6500 | 8.3 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF EP TOXICITY EXTRACTS

U-3911.14

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Arsenic | 6838* | <0.5 | <0.5 | -- |
| Barium | 6838* | <5 | <5 | -- |
| Cadmium | 6838* | <0.1 | <0.1 | -- |
| Chromium | 6838* | <0.5 | <0.5 | -- |
| Lead | 6838* | <0.5 | <0.5 | -- |
| Mercury | 6838* | <0.0008 | <0.0008 | -- |
| Selenium | 6838* | <0.5 | <0.5 | -- |
| Silver | 6838* | <0.5 | <0.5 | -- |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PHENOLS BY GC

(all results in ug/g, as received)

U-3911.17

| Compound | E & E Lab. No. 86- | 6875 | 6876 | 6877 | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9109 | 9110 | 9139 | | |
| phenol | | <1.0 | <1.0 | <1.0 | | |
| 2-chlorophenol | | <1.0 | <1.0 | <1.0 | | |
| 2-nitrophenol | | <1.0 | <1.0 | <1.0 | | |
| 2,4-dimethylphenol | | <1.0 | <1.0 | <1.0 | | |
| 2,4-dichlorophenol | | <1.0 | <1.0 | <1.0 | | |
| 4-chloro-3-methylphenol | | <1.0 | <1.0 | <1.0 | | |
| 2,4,6-trichlorophenol | | <1.0 | <1.0 | <1.0 | | |
| 2,4-dinitrophenol | | <1.0 | <1.0 | <1.0 | | |
| 4-nitrophenol | | <1.0 | <1.0 | <1.0 | | |
| 4,6-dinitro-2-methylphenol | | <1.0 | <1.0 | <1.0 | | |
| pentachlorophenol | | <1.0 | <1.0 | <1.0 | | |

*Compound present below measurable detection limit.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3969

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 7294 | 9111 | 0165-PG-008-GP-86-9111 |
| 7295 | 9112 | 0165-PG-008-GP-86-9112 |
| 7296 | 9113 | 0165-PG-008-GP-86-9113 |
| 7297 | 9088 | 0165-PG-005-GP-86-9088 |
| 7298 | 9089 | 0165-PG-005-GP-86-9089 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3969.14

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3969 | 7294 | 8/18 | 9/1 | 8/20,21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/25 | 8/21 | 9/20 | 8/26 |
| | 7295 | 8/18 | 9/1 | 8/20,21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/25 | 8/21 | 9/20 | 8/26 |
| | 7296 | 8/18 | 9/1 | 8/20,21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/25 | 8/21 | 9/20 | 8/26 |
| | 7297 | 8/18 | 9/1 | 8/20,21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/25 | 8/21 | 9/20 | 8/27 |
| | 7298 | 8/18 | 9/1 | 8/20,21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 7325 | 8/18 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/25 | 8/21 | 9/20 | 8/27 |

| | VOA Confirmation Date |
|---|---|
| 7297 | 8/21,28 |
| 7298 | 8/21,28 |

H-308

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3969.19

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3969 | 7294 | 8/18 | -- | -- | -- | -- | 8/25 | 8/20 | 9/29 | 8/22 | -- | -- | 9/15 | 9/11 | -- | -- |
| | 7295 | 8/18 | -- | -- | -- | -- | 8/25 | 8/20 | 9/29 | 8/22 | -- | -- | 9/15 | 9/11 | -- | -- |
| | 7296 | 8/18 | -- | -- | -- | -- | 8/25 | 8/20 | 9/29 | 8/22 | -- | -- | 9/15 | 9/11 | -- | -- |
| | 7297 | 8/18 | -- | -- | -- | -- | 8/25 | 8/20 | 9/29 | 8/25 | -- | -- | 9/15 | 9/15 | -- | -- |
| | 7298 | 8/18 | -- | -- | -- | -- | 8/25 | 8/20 | 9/29 | 8/25 | -- | -- | 9/15 | 9/15 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L as received)

U-3969.1

| Compound | E & E Lab. No. 86- | Blank | 7294 | 7295 | 7296 | 7297* |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/20/86 | 9111 | 9112 | 9113 | 9088 |
| chlorobenzene | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 |
| benzene | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| total xylenes | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| toluene | | <0.20 | <0.20 | <0.20 | <0.20 | 1.7 |
| ethylbenzene | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |

*Sample confirmed - results positive.

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3969.2

| Job No.: | U-3969 | | RE: | DF-2000 | | |
|---|---|---|---|---|---|---|
| Sample Date: | 8/18/86 | | P.O. No.: | | | |
| Date Received: | 8/19/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Water | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 7294 | 7295 | 7296 | 7297 | 7298 | Blank |
| Customer No. | 9111 | 9112 | 9113 | 9088 | 9089 | |
| Sample Identity | | | | | | |
| | Results in: mg/L unless noted | | | | | |
| Oil and Grease | 0.5 | 0.5 | 0.5 | 1.3 | 2.9 | NA |
| Antimony | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 |
| Beryllium | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Cadmium | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| Chromium | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Copper | <0.02 | <0.02 | <0.02 | <0.02 | 0.023 | <0.02 |
| Lead | <0.005 | 0.008 | 0.008 | 0.014 | 0.019 | <0.005 |
| Nickel | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Silver | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| Thallium | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Zinc | <0.05 | 0.298 | 0.179 | 0.195 | 0.209 | <0.05 |

NA: Not applicable.

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March, 1983.

Supervising Analyst: [signature]

Date: September 26, 1986

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L as received)

U-3969.3

| Compound | E & E Lab. No. 86- | 7298* | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9089 | | | | |
| chlorobenzene | | <0.20 | | | | |
| 1,2-dichlorobenzene | | <0.40 | | | | |
| 1,3-dichlorobenzene | | <0.40 | | | | |
| 1,4-dichlorobenzene | | <0.30 | | | | |
| benzene | | <0.20 | | | | |
| total xylenes | | <1.0 | | | | |
| toluene | | 2.2 | | | | |
| ethylbenzene | | <0.20 | | | | |

* Sample confirmed - results positive.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3969.4

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 1,2-dichlorobenzene | 7298 | <0.40 | 10.0 | 9.2 | 92 |
| 1,3-dichlorobenzene | 7298 | <0.40 | 10.0 | 9.1 | 91 |
| 1,4-dichlorobenzene | 7298 | <0.30 | 10.0 | 9.2 | 92 |
| toluene | 7298 | 2.2 | 10.0 | 12.5 | 103 |
| ethyl benzene | 7298 | <0.20 | 10.0 | 9.4 | 94 |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/L)

U-3969.5

| Compound | E & E Lab. No. 86- | Blank | 7294 | 7295 | 7296 | 7297* | 7298* |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/21/86 | 9111 | 9112 | 9113 | 9088 | 9089 |
| carbon tetrachloride | | <0.12 | <0.12 | <0.12 | <0.12 | <0.12 | <0.12 |
| 1,2-dichloroethane | | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 1,1,1-trichloroethane | | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| 1,1-dichloroethane | | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| chloroethane | | <0.52 | <0.52 | <0.52 | <0.52 | <0.52 | <0.52 |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | <0.13 | <0.13 | <0.13 | <0.13 |
| chloroform | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| 1,1-dichloroethene | | <0.13 | <0.13 | <0.13 | <0.13 | <0.13 | <0.13 |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| 1,2-dichloropropane | | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | <0.34 | <0.34 | <0.34 | <0.34 |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| methylene chloride | | <0.25 | <0.25 | <0.25 | <0.25 | 4.0 | 6.6 |
| chloromethane | | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 | <0.08 |
| bromomethane | | <1.18 | <1.18 | <1.18 | <1.18 | <1.18 | <1.18 |
| bromoform | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| bromodichloromethane | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| fluorotrichloromethane | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| dichlorodifluoromethane | | <1.81 | <1.81 | <1.81 | <1.81 | <1.81 | <1.81 |
| chlorodibromomethane | | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 | <0.09 |
| tetrachloroethene | | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 |
| trichloroethene | | <0.12 | <0.12 | <0.12 | <0.12 | <0.12 | <0.12 |
| vinyl chloride | | <0.18 | <0.18 | <0.18 | <0.18 | <0.18 | <0.18 |

*Sample confirmed - results positive.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3969.6

| Compound | E & E Laboratory No. 86-7297 | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| carbon tetrachloride | | <0.12 | 10.0 | 10.6 | 106 |
| 1,2-dichloroethane | | <0.03 | 10.0 | 11.4 | 114 |
| 1,1,1-trichloroethane | | <0.03 | 10.0 | 10.8 | 108 |
| 1,1-dichloroethane | | <0.07 | 10.0 | 13.6 | 136 |
| chloroethane | | <0.52 | 10.0 | 10.2 | 102 |
| chloroform | | <0.05 | 10.0 | 11.1 | 111 |
| trans-1,2-dichloroethene | | <0.10 | 10.0 | 13.0 | 130 |
| methylene chloride | | 4.0 | 10.0 | 12.3 | 83.0 |
| chloromethane | | <0.08 | 10.0 | 10.4 | 104 |
| bromomethane | | <1.18 | 10.0 | 14.0 | 140 |
| bromoform | | <0.20 | 10.0 | 11.0 | 110 |
| bromodichloromethane | | <0.10 | 10.0 | 10.1 | 101 |
| trichloroethene | | <0.12 | 10.0 | 8.59 | 85.9 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANTS
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3969.7

| Compound | E & E Lab. No. 86- | 7294 | 7295 | 7296 | 7297 | 7298 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9111 | 9112 | 9113 | 9088 | 9089 |
| bis(2-chloroethyl)ether | | <10 | <10 | <10 | <10 | <10 |
| 1,3-dichlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| 1,4-dichlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| 1,2-dichlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| bis(2-chloroisopropyl)ether | | <10 | <10 | <10 | <10 | <10 |
| N-nitrosodipropylamine | | <10 | <10 | <10 | <10 | <10 |
| hexachloroethane | | <10 | <10 | <10 | <10 | <10 |
| nitrobenzene | | <10 | <10 | <10 | <10 | <10 |
| isophorone | | <10 | <10 | <10 | <10 | <10 |
| bis(2-chloroethoxy)methane | | <10 | <10 | <10 | <10 | <10 |
| 1,2,4-trichlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| naphthalene | | <10 | <10 | <10 | <10 | <10 |
| hexachlorobutadiene | | <10 | <10 | <10 | <10 | <10 |
| hexachlorocyclopentadiene | | <10 | <10 | <10 | <10 | <10 |
| 2-chloronaphthalene | | <10 | <10 | <10 | <10 | <10 |
| dimethyl phthalate | | <10 | <10 | <10 | <10 | <10 |
| acenaphthylene | | <10 | <10 | <10 | <10 | <10 |
| fluorene | | <10 | <10 | <10 | <10 | <10 |
| acenaphthene | | <10 | <10 | <10 | <10 | <10 |
| 2,4-dinitrotoluene | | <10 | <10 | <10 | <10 | <10 |
| 2,6-dinitrotoluene | | <10 | <10 | <10 | <10 | <10 |
| diethylphthalate | | <10 | <10 | <10 | <10 | <10 |
| 4-chlorophenyl phenyl ether | | <10 | <10 | <10 | <10 | <10 |
| N-nitrosodiphenylamine | | <10 | <10 | <10 | <10 | <10 |
| 4-bromophenyl phenyl ether | | <10 | <10 | <10 | <10 | <10 |
| hexachlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| phenanthrene | | <10 | <10 | <10 | <10 | <10 |
| anthracene | | <10 | <10 | <10 | <10 | <10 |
| di-n-butyl phthalate | | 12 | 15 | 18 | 10 | 24 |
| fluoranthene | | <10 | <10 | <10 | <10 | <10 |
| benzidine | | <50 | <50 | <50 | <50 | <50 |
| pyrene | | <10 | <10 | <10 | <10 | <10 |
| butyl benzyl phthalate | | <10 | <10 | <10 | <10 | <10 |
| 3,3'-dichlorobenzidine | | <30 | <30 | <30 | <30 | <30 |
| benzo(a)anthracene | | <10 | <10 | <10 | <10 | <10 |
| bis(2-ethylhexyl)phthalate | | <10 | <10 | <10 | <10 | <10 |
| chrysene | | <10 | <10 | <10 | <10 | <10 |
| di-n-octyl phthalate | | <10 | <10 | <10 | <10 | <10 |
| benzo(b)fluoranthene | | <10 | <10 | <10 | <10 | <10 |
| benzo(k)fluoranthene | | <10 | <10 | <10 | <10 | <10 |
| benzo(a)pyrene | | <10 | <10 | <10 | <10 | <10 |
| indeno(1,2,3-cd)pyrene | | <10 | <10 | <10 | <10 | <10 |
| dibenzo(a,h)anthracene | | <10 | <10 | <10 | <10 | <10 |
| benzo(ghi)perylene | | <10 | <10 | <10 | <10 | <10 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3969.8

| Compound | E & E Lab. No. 86- | 7294 | 7295 | 7296 | 7297 | 7298 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9111 | 9112 | 9113 | 9088 | 9089 |
| phenol | | <10 | <10 | <10 | <10 | <10 |
| 2-chlorophenol | | <10 | <10 | <10 | <10 | <10 |
| 2-nitrophenol | | <10 | <10 | <10 | <10 | <10 |
| 2,4-dimethylphenol | | <10 | <10 | <10 | <10 | <10 |
| 2,4-dichlorophenol | | <10 | <10 | <10 | <10 | <10 |
| 4-chloro-3-methylphenol | | <10 | <10 | <10 | <10 | <10 |
| 2,4,6-trichlorophenol | | <10 | <10 | <10 | <10 | <10 |
| 2,4-dinitrophenol | | <30 | <30 | <30 | <30 | <30 |
| 4-nitrophenol | | <10 | <10 | <10 | <10 | <10 |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | <30 | <30 | <30 |
| pentachlorophenol | | <30 | <30 | <30 | <30 | <30 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3969.9

| Compound | E & E Lab. No. 86- | Method Blank | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | | | | | |
| bis(2-chloroethyl)ether | | <10 | | | | |
| 1,3-dichlorobenzene | | <10 | | | | |
| 1,4-dichlorobenzene | | <10 | | | | |
| 1,2-dichlorobenzene | | <10 | | | | |
| bis(2-chloroisopropyl)ether | | <10 | | | | |
| N-nitrosodipropylamine | | <10 | | | | |
| hexachloroethane | | <10 | | | | |
| nitrobenzene | | <10 | | | | |
| isophorone | | <10 | | | | |
| bis(2-chloroethoxy)methane | | <10 | | | | |
| 1,2,4-trichlorobenzene | | <10 | | | | |
| naphthalene | | <10 | | | | |
| hexachlorobutadiene | | <10 | | | | |
| hexachlorocyclopentadiene | | <10 | | | | |
| 2-chloronaphthalene | | <10 | | | | |
| dimethyl phthalate | | <10 | | | | |
| acenaphthylene | | <10 | | | | |
| fluorene | | <10 | | | | |
| acenaphthene | | <10 | | | | |
| 2,4-dinitrotoluene | | <10 | | | | |
| 2,6-dinitrotoluene | | <10 | | | | |
| diethylphthalate | | <10 | | | | |
| 4-chlorophenyl phenyl ether | | <10 | | | | |
| N-nitrosodiphenylamine | | <10 | | | | |
| 4-bromophenyl phenyl ether | | <10 | | | | |
| hexachlorobenzene | | <10 | | | | |
| phenanthrene | | <10 | | | | |
| anthracene | | <10 | | | | |
| di-n-butyl phthalate | | <10* | | | | |
| fluoranthene | | <10 | | | | |
| benzidine | | <50 | | | | |
| pyrene | | <10 | | | | |
| butyl benzyl phthalate | | <10 | | | | |
| 3,3'-dichlorobenzidine | | <30 | | | | |
| benzo(a)anthracene | | <10 | | | | |
| bis(2-ethylhexyl)phthalate | | <10 | | | | |
| chrysene | | <10 | | | | |
| di-n-octyl phthalate | | <10 | | | | |
| benzo(b)fluoranthene | | <10 | | | | |
| benzo(k)fluoranthene | | <10 | | | | |
| benzo(a)pyrene | | <10 | | | | |
| indeno(1,2,3-cd)pyrene | | <10 | | | | |
| dibenzo(a,h)anthracene | | <10 | | | | |
| benzo(ghi)perylene | | <10 | | | | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3969.10

| Compound | E & E Lab. No. 86- | Method Blank | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | | | | | |
| phenol | | <10 | | | | |
| 2-chlorophenol | | <10 | | | | |
| 2-nitrophenol | | <10 | | | | |
| 2,4-dimethylphenol | | <10 | | | | |
| 2,4-dichlorophenol | | <10 | | | | |
| 4-chloro-3-methylphenol | | <10 | | | | |
| 2,4,6-trichlorophenol | | <10 | | | | |
| 2,4-dinitrophenol | | <30 | | | | |
| 4-nitrophenol | | <10 | | | | |
| 4,6-dinitro-2-methylphenol | | <30 | | | | |
| pentachlorophenol | | <30 | | | | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3969.11

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| nitrobenzene-D5 | 7294 | 100 | 56 | 56 |
| | 7295 | 100 | 72 | 72 |
| | 7296 | 100 | 72 | 72 |
| | 7297 | 100 | 70 | 70 |
| | 7298 | 100 | 79 | 79 |
| 2-fluorobiphenyl | 7294 | 100 | 55 | 55 |
| | 7295 | 100 | 74 | 74 |
| | 7296 | 100 | 78 | 78 |
| | 7297 | 100 | 67 | 67 |
| | 7298 | 100 | 79 | 79 |
| terphenyl-D14 | 7294 | 100 | 57 | 57 |
| | 7295 | 100 | 84 | 84 |
| | 7296 | 100 | 74 | 74 |
| | 7297 | 100 | 69 | 69 |
| | 7298 | 100 | 73 | 73 |
| phenol-D5 | 7294 | 200 | 60 | 30 |
| | 7295 | 200 | 71 | 35.5 |
| | 7296 | 200 | 60 | 30 |
| | 7297 | 200 | 58 | 29 |
| | 7298 | 200 | 43 | 21.5 |
| 2-fluorophenol | 7294 | 200 | 94 | 47 |
| | 7295 | 200 | 90 | 45 |
| | 7296 | 200 | 89 | 44.5 |
| | 7297 | 200 | 107 | 53.5 |
| | 7298 | 200 | 83 | 41.5 |
| 2,4,6-tribromophenol | 7294 | 200 | 123 | 61.5 |
| | 7295 | 200 | 140 | 70 |
| | 7296 | 200 | 139 | 69.5 |
| | 7297 | 200 | 152 | 76 |
| | 7298 | 200 | 117 | 58.5 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3969.12

| Compound | E & E Lab. No. 86-7294 | ug/L | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| bis(2-chloroethyl)ether | | <10 | <10 | -- |
| 1,3-dichlorobenzene | | <10 | <10 | -- |
| 1,4-dichlorobenzene | | <10 | <10 | -- |
| 1,2-dichlorobenzene | | <10 | <10 | -- |
| bis(2-chloroisopropyl)ether | | <10 | <10 | -- |
| N-nitrosodipropylamine | | <10 | <10 | -- |
| hexachloroethane | | <10 | <10 | -- |
| nitrobenzene | | <10 | <10 | -- |
| isophorone | | <10 | <10 | -- |
| bis(2-chloroethoxy)methane | | <10 | <10 | -- |
| 1,2,4-trichlorobenzene | | <10 | <10 | -- |
| naphthalene | | <10 | <10 | -- |
| hexachlorobutadiene | | <10 | <10 | -- |
| hexachlorocyclopentadiene | | <10 | <10 | -- |
| 2-chloronaphthalene | | <10 | <10 | -- |
| dimethyl phthalate | | <10 | <10 | -- |
| acenaphthylene | | <10 | <10 | -- |
| fluorene | | <10 | <10 | -- |
| acenaphthene | | <10 | <10 | -- |
| 2,4-dinitrotoluene | | <10 | <10 | -- |
| 2,6-dinitrotoluene | | <10 | <10 | -- |
| diethylphthalate | | <10 | <10 | -- |
| 4-chlorophenyl phenyl ether | | <10 | <10 | -- |
| N-nitrosodiphenylamine | | <10 | <10 | -- |
| 4-bromophenyl phenyl ether | | <10 | <10 | -- |
| hexachlorobenzene | | <10 | <10 | -- |
| phenanthrene | | <10 | <10 | -- |
| anthracene | | <10 | <10 | -- |
| di-n-butyl phthalate | | 12 | 23 | 62.9 |
| fluoranthene | | <10 | <10 | -- |
| benzidine | | <50 | <50 | -- |
| pyrene | | <10 | <10 | -- |
| butyl benzyl phthalate | | <10 | <10 | -- |
| 3,3'-dichlorobenzidine | | <30 | <30 | -- |
| benzo(a)anthracene | | <10 | <10 | -- |
| bis(2-ethylhexyl)phthalate | | <10 | <10 | -- |
| chrysene | | <10 | <10 | -- |
| di-n-octyl phthalate | | <10 | <10 | -- |
| benzo(b)fluoranthene | | <10 | <10 | -- |
| benzo(k)fluoranthene | | <10 | <10 | -- |
| benzo(a)pyrene | | <10 | <10 | -- |
| indeno(1,2,3-c,d)pyrene | | <10 | <10 | -- |
| dibenzo(a,h)anthracene | | <10 | <10 | -- |
| benzo(g,h,i)perylene | | <10 | <10 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3969.13

| Compound | E & E Lab. No. 86-7294 | ug/L | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| phenol | | <10 | <10 | -- |
| 2-chlorophenol | | <10 | <10 | -- |
| 2-nitrophenol | | <10 | <10 | -- |
| 2,4-dimethylphenol | | <10 | <10 | -- |
| 2,4-dichlorophenol | | <10 | <10 | -- |
| 4-chloro-3-methylphenol | | <10 | <10 | -- |
| 2,4,6-trichlorophenol | | <10 | <10 | -- |
| 2,4-dinitrophenol | | <30 | <30 | -- |
| 4-nitrophenol | | <10 | <10 | -- |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | -- |
| pentachlorophenol | | <30 | <30 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-3969.16

| Compound | E & E Lab. No. 86- | Blank | 7294 | 7295 | 7296 | 7297 |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/21/86 | 9111 | 9112 | 9113 | 9088 |
| phenol | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 2-chlorophenol | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 2-nitrophenol | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 2,4-dimethylphenol | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 2,4-dichlorophenol | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 4-chloro-3-methylphenol | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 2,4,6-trichlorophenol | | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 2,4-dinitrophenol | | <13 | <13 | <13 | <13 | <13 |
| 4-nitrophenol | | <2.8 | <2.8 | <2.8 | <2.8 | <2.8 |
| 4,6-dinitro-2-methylphenol | | <16 | <16 | <16 | <16 | <16 |
| pentachlorophenol | | <7.4 | <7.4 | <7.4 | <7.4 | <7.4 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-3969.17

| Compound | E & E Lab. No. 86- | 7325 | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9089 | | | | |
| phenol | | <2.0 | | | | |
| 2-chlorophenol | | <2.0 | | | | |
| 2-nitrophenol | | <2.0 | | | | |
| 2,4-dimethylphenol | | <2.0 | | | | |
| 2,4-dichlorophenol | | <2.0 | | | | |
| 4-chloro-3-methylphenol | | <2.0 | | | | |
| 2,4,6-trichlorophenol | | <2.0 | | | | |
| 2,4-dinitrophenol | | <13 | | | | |
| 4-nitrophenol | | <2.8 | | | | |
| 4,6-dinitro-2-methylphenol | | <16 | | | | |
| pentachlorophenol | | <7.4 | | | | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3969.18

| Compound | E & E Lab No.: DI Spike | (ug/L) Original Analysis | Amount Spiked | Amount Recovered | Percent Recovery |
|---|---|---|---|---|---|
| phenol | | <2.0 | 40 | 35 | 88 |
| 2-chlorophenol | | <2.0 | 40 | 23 | 58 |
| 2-nitrophenol | | <2.0 | 40 | 38 | 95 |
| 2,4-dimethylphenol | | <2.0 | 40 | 32 | 80 |
| 2,4-dichlorophenol | | <2.0 | 40 | 36 | 90 |
| 4-chloro-3-methylphenol | | <2.0 | 40 | 39 | 98 |
| 2,4,6-trichlorophenol | | <2.0 | 40 | 38 | 95 |
| 2,4-dinitrophenol | | <13 | 40 | 42 | 105 |
| 4-nitrophenol | | <2.8 | 40 | 18 | 45 |
| 4,6-dinitro-2-methylphenol | | <16 | 40 | 42 | 105 |
| pentachlorophenol | | <7.4 | 40 | 41 | 103 |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3969.20

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Antimony | 990 | 1112 | 12.3 |
| Beryllium | 960 | 1006 | 4.8 |
| Cadmium | 940 | 963 | 2.4 |
| Chromium | 1030 | 1056 | 2.5 |
| Copper | 1030 | 1042 | 1.2 |
| Lead | 53.0 | 49.5 | 6.6 |
| Nickel | 1020 | 1040 | 2.0 |
| Silver | 6000 | 6152 | 2.5 |
| Thallium | 25.0 | 25.2 | 0.8 |
| Zinc | 1010 | 1024 | 1.4 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3969.21

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Antimony | 7298 | <0.15 | <0.15 | -- |
| Baryllium | 7298 | <0.01 | <0.01 | -- |
| Cadmium | 7298 | <0.005 | <0.005 | -- |
| Chromium | 7298 | <0.05 | <0.05 | -- |
| Copper | 7298 | 0.023 | 0.022 | 4.4 |
| Lead | 7298 | 0.019 | 0.020 | 5.1 |
| Nickel | 7298 | <0.1 | <0.1 | -- |
| Silver | 7298 | <0.04 | <0.04 | -- |
| Thallium | 7298 | <0.20 | <0.20 | -- |
| Zinc | 7298 | 0.209 | 0.219 | 4.7 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3969.22

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/L) | | | |
| Oil and Grease | DI Spike | <0.2 | 7.4 | 9.6 | 130 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3978

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 7326 | 9114 | 0165-PG-008-GP-86-9114 |
| 7327 | 9115 | 0165-PG-008-GP-86-9115 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3978.15

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | IDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3978 | 7326 | 8/19 | -- | -- | -- | -- | 8/26 | 8/21 | 9/30 | 9/3 | -- | -- | 9/16 | 9/12 | -- | -- |
| | 7327 | 8/19 | -- | -- | -- | -- | 8/26 | 8/21 | 9/30 | 9/3 | -- | -- | 9/16 | 9/12 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3978.16

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3978 | 7326 | 8/19 | 9/2 | 8/21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/26 | 8/21 | 9/20 | 8/21 |
| | 7327 | 8/19 | 9/2 | 8/21 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8/26 | 8/21 | 9/20 | 8/21 |

VOA
CONFIRMATION
DATE

7326 8/21

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

ecology and environment, inc.
International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3978.1

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3978 | | | RE: DF-2000 | | | |
| Sample Date: 8/19/86 | | | P.O. No.: | | | |
| Date Received: 8/20/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Water | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 7326 | 7327 | Blank | | | |
| Customer No. | 9114 | 9115 | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/L unless noted | | | | | |
| Oil and Grease | 0.4 | 0.5 | NA | | | |
| Antimony | <0.15 | <0.15 | <0.15 | | | |
| Beryllium | <0.01 | <0.01 | <0.01 | | | |
| Cadmium | <0.005 | <0.005 | <0.005 | | | |
| Chromium | <0.05 | <0.05 | <0.05 | | | |
| Copper | <0.02 | <0.02 | <0.02 | | | |
| Lead | <0.005 | 0.038 | <0.005 | | | |
| Nickel | <0.1 | <0.1 | <0.1 | | | |
| Silver | <0.04 | <0.04 | <0.04 | | | |
| Thallium | <0.20 | <0.20 | <0.20 | | | |
| Zinc | 0.101 | 2.91 | <0.05 | | | |

NA: Not Applicable

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983.

Supervising Analyst: Gary Hahn/KG

Date: September 26, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L)

U-3978.2

| Compound | E & E Lab. No. 86- | Blank | 7326* | 7327 | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/21/86 | 9114 | 9115 | | |
| chlorobenzene | | <0.20 | <0.20 | <0.20 | | |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | <0.40 | | |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | <0.40 | | |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | <0.30 | | |
| benzene | | <0.20 | <0.20 | <0.20 | | |
| total xylenes | | <1.0 | <1.0 | <1.0 | | |
| toluene | | <0.20 | 1.0 | <0.20 | | |
| ethylbenzene | | <0.20 | <0.20 | <0.20 | | |

*Sample confirmed-results positive

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3978.3

| Parameter | E & E Laboratory No. 86- | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | 7327 | <0.20 | <0.20 | -- |
| 1,2-dichlorobenzene | 7327 | <0.40 | <0.40 | -- |
| 1,3-dichlorobenzene | 7327 | <0.40 | <0.40 | -- |
| 1,4-dichlorobenzene | 7327 | <0.30 | <0.30 | -- |
| benzene | 7327 | <0.20 | <0.20 | -- |
| total xylenes | 7327 | <1.0 | <1.0 | -- |
| toluene | 7327 | <0.20 | <0.20 | -- |
| ethyl benzene | 7327 | <0.20 | <0.20 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-3978.4

| Compound | E & E Lab. No. 86- | Blank | 7326 | 7327 | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/21/86 | 9114 | 9115 | | |
| phenol | | <2.0 | <2.0 | <2.0 | | |
| 2-chlorophenol | | <2.0 | <2.0 | <2.0 | | |
| 2-nitrophenol | | <2.0 | <2.0 | <2.0 | | |
| 2,4-dimethylphenol | | <2.0 | <2.0 | <2.0 | | |
| 2,4-dichlorophenol | | <2.0 | <2.0 | <2.0 | | |
| 4-chloro-3-methylphenol | | <2.0 | <2.0 | <2.0 | | |
| 2,4,6-trichlorophenol | | <2.0 | <2.0 | <2.0 | | |
| 2,4-dinitrophenol | | <13 | <13 | <13 | | |
| 4-nitrophenol | | <2.8 | <2.8 | <2.8 | | |
| 4,6-dinitro-2-methylphenol | | <16 | <16 | <16 | | |
| pentachlorophenol | | <7.4 | <7.4 | <7.4 | | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3978.5

| Compound | E & E Lab. No. 86- | 7326 | 7327 | Method Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9114 | 9115 | | | |
| phenol | | <10 | <10 | <10 | | |
| 2-chlorophenol | | <10 | <10 | <10 | | |
| 2-nitrophenol | | <10 | <10 | <10 | | |
| 2,4-dimethylphenol | | <10 | <10 | <10 | | |
| 2,4-dichlorophenol | | <10 | <10 | <10 | | |
| 4-chloro-3-methylphenol | | <10 | <10 | <10 | | |
| 2,4,6-trichlorophenol | | <10 | <10 | <10 | | |
| 2,4-dinitrophenol | | <30 | <30 | <30 | | |
| 4-nitrophenol | | <10 | <10 | <10 | | |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | <30 | | |
| pentachlorophenol | | <30 | <30 | <30 | | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3978.6

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| nitrobenzene-D5 | 7326 | 100 | 67 | 67 |
| | 7327 | 100 | 77 | 77 |
| 2-fluorobiphenyl | 7326 | 100 | 73 | 73 |
| | 7327 | 100 | 74 | 74 |
| terphenyl-D14 | 7326 | 100 | 51 | 51 |
| | 7327 | 100 | 55 | 55 |
| phenol D5 | 7326 | 200 | 64 | 32 |
| | 7327 | 200 | 68 | 24 |
| 2-fluorophenol | 7326 | 200 | 102 | 51 |
| | 7327 | 200 | 67 | 32.3 |
| 2,4,6-tribromophenol | 7326 | 200 | 141 | 73 |
| | 7327 | 200 | 104 | 52 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3978.7

| Compound | E & E Lab. No. 86-7326 | µg/L | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| phenol | | <10 | <10 | -- |
| 2-chlorophenol | | <10 | <10 | -- |
| 2-nitrophenol | | <10 | <10 | -- |
| 2,4-dimethylphenol | | <10 | <10 | -- |
| 2,4-dichlorophenol | | <10 | <10 | -- |
| 4-chloro-3-methylphenol | | <10 | <10 | -- |
| 2,4,6-trichlorophenol | | <10 | <10 | -- |
| 2,4-dinitrophenol | | <30 | <30 | -- |
| 4-nitrophenol | | <10 | <10 | -- |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | -- |
| pentachlorophenol | | <30 | <30 | -- |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3978.8

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Antimony | 990 | 1112 | 12.3 |
| Beryllium | 960 | 1006 | 4.8 |
| Cadmium | 940 | 963 | 2.4 |
| Chromium | 1030 | 1056 | 2.5 |
| Copper | 1030 | 1042 | 1.2 |
| Lead | 53.0 | 49.5 | 6.6 |
| Nickel | 1020 | 1040 | 2.0 |
| Silver | 6000 | 6152 | 2.5 |
| Thallium | 25.0 | 25.2 | 0.8 |
| Zinc | 1010 | 1024 | 1.4 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/L)

U-3978.9

| Compound | E & E Lab. No. 86- | Blank | 7326 | 7327 | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/21/86 | 9114 | 9115 | | | |
| carbon tetrachloride | | <0.12 | <0.12 | <0.12 | | | |
| 1,2-dichloroethane | | <0.03 | <0.03 | <0.03 | | | |
| 1,1,1-trichloroethane | | <0.03 | <0.03 | <0.03 | | | |
| 1,1-dichloroethane | | <0.07 | <0.07 | <0.07 | | | |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | <0.02 | | | |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | <0.03 | | | |
| chloroethane | | <0.52 | <0.52 | <0.52 | | | |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | <0.13 | | | |
| chloroform | | <0.05 | <0.05 | <0.05 | | | |
| 1,1-dichloroethene | | <0.13 | <0.13 | <0.13 | | | |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | <0.10 | | | |
| 1,2-dichloropropane | | <0.04 | <0.04 | <0.04 | | | |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | <0.34 | | | |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | <0.20 | | | |
| methylene chloride | | <0.25 | <0.25 | <0.25 | | | |
| chloromethane | | <0.08 | <0.08 | <0.08 | | | |
| bromomethane | | <1.18 | <1.18 | <1.18 | | | |
| bromoform | | <0.20 | <0.20 | <0.20 | | | |
| bromodichloromethane | | <0.10 | <0.10 | <0.10 | | | |
| fluorotrichloromethane | | <2.0 | <2.0 | <2.0 | | | |
| dichlorodifluoromethane | | <1.81 | <1.81 | <1.81 | | | |
| chlorodibromomethane | | <0.09 | <0.09 | <0.09 | | | |
| tetrachloroethene | | <0.03 | <0.03 | <0.03 | | | |
| trichloroethene | | <0.12 | <0.12 | <0.12 | | | |
| vinyl chloride | | <0.18 | <0.18 | <0.18 | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3978.10

| Compound | E & E Laboratory No. 86- | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| carbon tetrachloride | 7327 | <0.12 | <0.12 | -- |
| 1,2-dichloroethane | 7327 | <0.03 | <0.03 | -- |
| 1,1,1-trichloroethane | 7327 | <0.03 | <0.03 | -- |
| 1,1-dichloroethane | 7327 | <0.07 | <0.07 | -- |
| 1,1,2-trichloroethane | 7327 | <0.02 | <0.02 | -- |
| 1,1,2,2-tetrachloroethane | 7327 | <0.03 | <0.03 | -- |
| chloroethane | 7327 | <0.52 | <0.52 | -- |
| 2-chloroethylvinyl ether | 7327 | <0.13 | <0.13 | -- |
| chloroform | 7327 | <0.05 | <0.05 | -- |
| 1,1-dichloroethene | 7327 | <0.13 | <0.13 | -- |
| trans-1,2-dichloroethene | 7327 | <0.10 | <0.10 | -- |
| 1,2-dichloropropane | 7327 | <0.04 | <0.04 | -- |
| trans-1,3-dichloropropene | 7327 | <0.34 | <0.34 | -- |
| cis-1,3-dichloropropene | 7327 | <0.20 | <0.20 | -- |
| methylene chloride | 7327 | <0.25 | <0.25 | -- |
| chloromethane | 7327 | <0.08 | <0.08 | -- |
| bromomethane | 7327 | <1.18 | <1.18 | -- |
| bromoform | 7327 | <0.20 | <0.20 | -- |
| bromodichloromethane | 7327 | <0.10 | <0.10 | -- |
| fluorotrichloromethane | 7327 | <2.0 | <2.0 | -- |
| dichlorodifluoromethane | 7327 | <1.81 | <1.81 | -- |
| chlorodibromomethane | 7327 | <0.09 | <0.09 | -- |
| tetrachloroethene | 7327 | <0.03 | <0.03 | -- |
| trichloroethene | 7327 | <0.12 | <0.12 | -- |
| vinyl chloride | 7327 | <0.18 | <0.18 | -- |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3978.11

| Compound | E & E Lab. No. 86- | 7326 | 7327 | Method Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9114 | 9115 | | | |
| bis(2-chloroethyl)ether | | <10 | <10 | <10 | | |
| 1,3-dichlorobenzene | | <10 | <10 | <10 | | |
| 1,4-dichlorobenzene | | <10 | <10 | <10 | | |
| 1,2-dichlorobenzene | | <10 | <10 | <10 | | |
| bis(2-chloroisopropyl)ether | | <10 | <10 | <10 | | |
| N-nitrosodipropylamine | | <10 | <10 | <10 | | |
| hexachloroethane | | <10 | <10 | <10 | | |
| nitrobenzene | | <10 | <10 | <10 | | |
| isophorone | | <10 | <10 | <10 | | |
| bis(2-chloroethoxy)methane | | <10 | <10 | <10 | | |
| 1,2,4-trichlorobenzene | | <10 | <10 | <10 | | |
| naphthalene | | <10 | <10 | <10 | | |
| hexachlorobutadiene | | <10 | <10 | <10 | | |
| hexachlorocyclopentadiene | | <10 | <10 | <10 | | |
| 2-chloronaphthalene | | <10 | <10 | <10 | | |
| dimethyl phthalate | | <10 | <10 | <10 | | |
| acenaphthylene | | <10 | <10 | <10 | | |
| fluorene | | <10 | <10 | <10 | | |
| acenaphthene | | <10 | <10 | <10 | | |
| 2,4-dinitrotoluene | | <10 | <10 | <10 | | |
| 2,6-dinitrotoluene | | <10 | <10 | <10 | | |
| diethylphthalate | | <10 | <10 | <10 | | |
| 4-chlorophenyl phenyl ether | | <10 | <10 | <10 | | |
| N-nitrosodiphenylamine | | <10 | <10 | <10 | | |
| 4-bromophenyl phenyl ether | | <10 | <10 | <10 | | |
| hexachlorobenzene | | <10 | <10 | <10 | | |
| phenanthrene | | <10 | <10 | <10 | | |
| anthracene | | <10 | <10 | <10 | | |
| di-n-butyl phthalate | | <10 | <10 | <10 | | |
| fluoranthene | | <10 | <10 | <10 | | |
| benzidine | | <50 | <50 | <50 | | |
| pyrene | | <10 | <10 | <10 | | |
| butyl benzyl phthalate | | <10 | <10 | <10 | | |
| 3,3'-dichlorobenzidine | | <30 | <30 | <30 | | |
| benzo(a)anthracene | | <10 | <10 | <10 | | |
| bis(2-ethylhexyl)phthalate | | <10 | <10 | <10 | | |
| chrysene | | <10 | <10 | <10 | | |
| di-n-octyl phthalate | | <10 | <10 | <10 | | |
| benzo(b)fluoranthene | | <10 | <10 | <10 | | |
| benzo(k)fluoranthene | | <10 | <10 | <10 | | |
| benzo(a)pyrene | | <10 | <10 | <10 | | |
| indeno(1,2,3-cd)pyrene | | <10 | <10 | <10 | | |
| dibenzo(a,h)anthracene | | <10 | <10 | <10 | | |
| benzo(ghi)perylene | | <10 | <10 | <10 | | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3978.12

| Compound | E & E Lab. No. 86-7326 | ug/L | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| bis(2-chloroethyl)ether | | <10 | <10 | -- |
| 1,3-dichlorobenzene | | <10 | <10 | -- |
| 1,4-dichlorobenzene | | <10 | <10 | -- |
| 1,2-dichlorobenzene | | <10 | <10 | -- |
| bis(2-chloroisopropyl)ether | | <10 | <10 | -- |
| N-nitrosodipropylamine | | <10 | <10 | -- |
| hexachloroethane | | <10 | <10 | -- |
| nitrobenzene | | <10 | <10 | -- |
| isophorone | | <10 | <10 | -- |
| bis(2-chloroethoxy)methane | | <10 | <10 | -- |
| 1,2,4-trichlorobenzene | | <10 | <10 | -- |
| naphthalene | | <10 | <10 | -- |
| hexachlorobutadiene | | <10 | <10 | -- |
| hexachlorocyclopentadiene | | <10 | <10 | -- |
| 2-chloronaphthalene | | <10 | <10 | -- |
| dimethyl phthalate | | <10 | <10 | -- |
| acenaphthylene | | <10 | <10 | -- |
| fluorene | | <10 | <10 | -- |
| acenaphthene | | <10 | <10 | -- |
| 2,4-dinitrotoluene | | <10 | <10 | -- |
| 2,6-dinitrotoluene | | <10 | <10 | -- |
| diethylphthalate | | <10 | <10 | -- |
| 4-chlorophenyl phenyl ether | | <10 | <10 | -- |
| N-nitrosodiphenylamine | | <10 | <10 | -- |
| 4-bromophenyl phenyl ether | | <10 | <10 | -- |
| hexachlorobenzene | | <10 | <10 | -- |
| phenanthrene | | <10 | <10 | -- |
| anthracene | | <10 | <10 | -- |
| di-n-butyl phthalate | | <10 | <10 | -- |
| fluoranthene | | <10 | <10 | -- |
| benzidine | | <50 | <50 | -- |
| pyrene | | <10 | <10 | -- |
| butyl benzyl phthalate | | <10 | <10 | -- |
| 3,3'-dichlorobenzidine | | <30 | <30 | -- |
| benzo(a)anthracene | | <10 | <10 | -- |
| bis(2-ethylhexyl)phthalate | | <10 | <10 | -- |
| chrysene | | <10 | <10 | -- |
| di-n-octyl phthalate | | <10 | <10 | -- |
| benzo(b)fluoranthene | | <10 | <10 | -- |
| benzo(k)fluoranthene | | <10 | <10 | -- |
| benzo(a)pyrene | | <10 | <10 | -- |
| indeno(1,2,3-c,d)pyrene | | <10 | <10 | -- |
| dibenzo(a,h)anthracene | | <10 | <10 | -- |
| benzo(g,h,i)perylene | | <10 | <10 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3978.13

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Cadmium | 7298* | <0.005 | <0.005 | -- |
| Chromium | 7298* | <0.05 | <0.05 | -- |
| Copper | 7298* | 0.023 | 0.022 | 4.4 |
| Lead | 7298* | 0.019 | 0.020 | 5.1 |
| Nickel | 7298* | <0.1 | <0.1 | -- |
| Zinc | 7298* | 0.209 | 0.219 | 4.7 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3978.14

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/L) | | | |
| Oil and Grease | D.I. Spike | <0.2 | 7.4 | 10.3 | 139 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3772

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 5760 | 9116 | 0165-SO-009-GS-86-9116 |
| 5761 | 9117 | 0165-SO-009-GS-86-9117 |
| 5762 | 9118 | 0165-SO-009-GS-86-9118 |
| 5763 | 9119 | 0165-SO-009-GS-86-9119 |
| 5764 | 9120 | 0165-SO-009-GS-86-9120 |
| 5765 | 9121 | 0165-SO-009-GS-86-9121 |
| 5766 | 9122 | 0165-SO-009-GS-86-9122 |
| 5767 | 9123 | 0165-SO-009-GS-86-9123 |
| 5768 | 9124 | 0165-SO-009-GS-86-9124 |
| 5769 | 9125 | 0165-SO-009-GS-86-9125 |
| 5770 | 9126 | 0165-SO-009-GS-86-9126 |
| 5771 | 9127 | 0165-SO-009-GS-86-9127 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3772.1

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 5772 | 9128 | 0165-SO-009-GS-86-9128 |
| 5773 | 9129 | 0165-SO-009-GS-86-9129 |
| 5774 | 9130 | 0165-SO-009-GS-86-9130 |
| 5775 | 9131 | 0165-SO-009-GS-86-9131 |
| 5776 | 9132 | 0165-SO-009-GS-86-9132 |
| 5777 | 9133 | 0165-SO-009-GS-86-9133 |
| 5778 | 9134 | 0165-SO-009-GS-86-9134 |
| 5779 | 9135 | 0165-SO-009-GS-86-9135 |
| 5780 | 9136 | 0165-SO-009-GS-86-9136 |
| 5781 | 9137 | 0165-SO-009-GS-86-9137 |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3772.44

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3772 | 5760 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5761 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5762 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5763 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5764 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5765 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5766 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5767 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5768 | 7/24 | 8/7 | 7/25,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5769 | 7/24 | 8/7 | 7/26,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5770 | 7/24 | 8/7 | 7/26,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5771 | 7/24 | 8/7 | 7/26,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5772 | 7/24 | 8/7 | 7/26,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5773 | 7/24 | 8/7 | 7/26,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5774 | 7/24 | 8/7 | 7/26,30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5775 | 7/24 | 8/7 | 7/26,31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5776 | 7/24 | 8/7 | 7/26,31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5777 | 7/24 | 8/7 | 7/28,31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5778 | 7/24 | 8/7 | 7/28,31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5779 | 7/24 | 8/7 | 7/28,31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5780 | 7/24 | 8/7 | 7/28,31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 5781 | 7/24 | 8/7 | 7/28,31 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3772.45

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(14/E + 40) | | | | TDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3772 | 5760 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/11 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5761 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/7 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5762 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/11 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5763 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/8 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5764 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/8 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5765 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/6 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5766 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/11 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5767 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/8 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5768 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/6 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5769 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/6 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5770 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/6 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5771 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/6 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5772 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/6 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5773 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/6 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5774 | 7/24 | -- | -- | -- | -- | 8/7 | 7/25 | 9/3 | 8/6 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5775 | 7/24 | -- | -- | -- | -- | 8/7 | 7/29 | 9/7 | 8/26 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5776 | 7/24 | -- | -- | -- | -- | 8/7 | 7/29 | 9/7 | 8/26 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5777 | 7/24 | -- | -- | -- | -- | 8/7 | 7/29 | 9/7 | 8/26 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5778 | 7/24 | -- | -- | -- | -- | 8/7 | 7/29 | 9/7 | 8/26 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5779 | 7/24 | -- | -- | -- | -- | 8/7 | 7/29 | 9/7 | 8/26 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5780 | 7/24 | -- | -- | -- | -- | 8/7 | 7/29 | 9/7 | 8/27 | -- | -- | 8/21 | 7/28 | -- | -- |
| | 5781 | 7/24 | -- | -- | -- | -- | 8/7 | 7/29 | 9/7 | 8/27 | -- | -- | 8/21 | 7/28 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3772.2

| Job No.: U-3772 | | | RE: DF-2000 | | | |
|---|---|---|---|---|---|---|
| Sample Date: 7/24/86 | | | P.O. No.: | | | |
| Date Received: 7/25/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 5760 | 5761 | 5762 | 5763 | 5764 | 5765 |
| Customer No. | 9116 | 9117 | 9118 | 9119 | 9120 | 9121 |
| Sample Identity | | | | | | |
| | Results in: mg/kg unless noted | | | | | |
| Oil and Grease | 2940 | 1520 | 2190 | 1620 | 500 | 170 |
| Arsenic | 1.28 | <5.2† | 1.46 | <5.2† | <5.2† | <5.2† |
| Cadmium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chromium | 7.43 | 9.50 | 8.57 | 7.10 | 9.71 | 10.3 |
| Copper | 3.38 | 5.66 | 4.77 | 6.31 | 6.96 | 7.60 |
| Lead | <5.2† | <5.2† | <5.2† | 67.3 | 22.2 | 8.99 |
| Nickel | <10 | <10 | <10 | <10 | <10 | <10 |
| Zinc | 15.6 | 24.1 | 19.8 | 33.7 | 29.9 | 30.5 |
| Solids, % | 93 | 94 | 94 | 96 | 94 | 87 |

†Elevated detection limit due to matrix interference.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: [signature]

Date: September 2, 1986

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3772.3

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3772 | | | RE: DF-2000 | | | |
| Sample Date: 7/24/86 | | | P.O. No.: | | | |
| Date Received: 7/25/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 5766 | 5767 | 5768 | 5769 | 5770 | 5771 |
| Customer No. | 9122 | 9123 | 9124 | 9125 | 9126 | 9127 |
| Sample Identity | | | | | | |
| | Results in: mg/kg unless noted | | | | | |
| Oil and Grease | 4080 | 2620 | 190 | 740 | 670 | 160 |
| Arsenic | <5.2† | <5.2† | <5.2† | <5.2† | <5.2† | <5.2† |
| Cadmium | <0.5 | <0.5 | <0.5 | 1.15 | 0.865 | <0.5 |
| Chromium | 8.02 | 12.4 | 12.4 | 8.59 | 10.6 | 9.62 |
| Copper | 4.48 | 7.81 | 8.41 | 9.45 | 9.39 | 8.18 |
| Lead | 6.04 | 60.8 | 21.5 | 68.7 | 69.5 | 27.5 |
| Nickel | <10 | <10 | <10 | <10 | <10 | <10 |
| Zinc | 19.2 | 42.0 | 33.9 | 38.8 | 47.4 | 37.6 |
| Solids, % | 90 | 92 | 93 | 97 | 96 | 93 |

†Elevated detection limit due to matrix interference.

Analytical References:

"Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater," EPA-600/4-82-057, July 1982.

Supervising Analyst: Gary Hahn / KS

Date: September 8, 1986

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3772.4

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3772 | | | RE: DF-2000 | | | |
| Sample Date: 7/24/86 | | | P.O. No.: | | | |
| Date Received: 7/25/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 5772 | 5773 | 5774 | 5775 | 5776 | 5777 |
| Customer No. | 9128 | 9129 | 9130 | 9131 | 9132 | 9133 |
| Sample Identity | | | | | | |
| | Results in: mg/kg unless noted | | | | | |
| Oil and Grease | <100 | 260 | 350 | 140 | 140 | 160 |
| Arsenic | <5.2† | <5.2† | <5.2† | <5.2† | <5.2† | <5.2† |
| Cadmium | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chromium | 13.7 | 8.33 | 12.1 | 12.4 | 9.49 | 9.53 |
| Copper | 8.89 | 7.06 | 8.29 | 8.25 | 7.84 | 7.85 |
| Lead | 12.8 | 17.2 | 21.0 | 12.0 | 38.7 | 10.1 |
| Nickel | 10.8 | <10 | <10 | <10 | <10 | <10 |
| Zinc | 36.1 | 28.0 | 34.2 | 47.5 | 42.7 | 34.7 |
| Solids, % | 92 | 96 | 95 | 96 | 96 | 95 |

†Elevated detection limit due to matrix interference.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Hahn/KS

Date: September 6, 1986

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# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3772.5

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3772 | | | RE: DF-2000 | | | |
| Sample Date: 7/24/86 | | | P.O. No.: | | | |
| Date Received: 7/25/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Soil | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 5778 | 5779 | 5780 | 5781 | Blank* | |
| Customer No. | 9134 | 9135 | 9136 | 9137 | | |
| Sample Identity | | | | | | |
| | *Results in: mg/kg unless noted* | | | | | |
| Oil and Grease | 160 | 140 | 260 | <100 | NA | |
| Arsenic | <5.2† | <5.2† | <5.2† | <5.2† | <0.005 | |
| Cadmium | <0.5 | <0.5 | <0.5 | <0.5 | <0.005 | |
| Chromium | 10.6 | 9.82 | 10.8 | 9.48 | <0.05 | |
| Copper | 8.00 | 7.71 | 8.53 | 7.74 | <0.02 | |
| Lead | 31.1 | 19.9 | 16.8 | 9.90 | <0.005 | |
| Nickel | <10 | <10 | <10 | <10 | <0.1 | |
| Zinc | 31.3 | 28.2 | 32.9 | 28.1 | <0.05 | |
| Solids, % | 94 | 95 | 94 | 94 | NA | |

*mg/L

NA-not applicable

†Elevated detection limit due to matrix interference.

Analytical References:

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,"SW-846, Second Edition, U.S. EPA, 1982.

Supervising Analyst: Gary Stahn/KSS

Date: September 19, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3772.6

| Compound | E & E Lab. No. 86- | Blank | Blank | Blank | Blank | 5760 | 5761 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 7/25/86 | 7/25/86 | 7/26/86 | 7/28/86 | 9116 | 9117 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3772.7

| Compound | E & E Lab. No. 86- | 5762 | 5763 | 5364 | 5765 | 5766 | 5767 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9118 | 9119 | 9120 | 9121 | 9122 | 9123 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3772.8

| Compound | E & E Lab. No. 86- | 5768 | 5769 | 5770 | 5771 | 5772 | 5773 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9124 | 9125 | 9126 | 9127 | 9128 | 9129 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3772.9

| Compound | E & E Lab. No. 86- | 5774 | 5775 | 5776 | 5777 | 5778 | 5779 |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9130 | 9131 | 9132 | 9133 | 9134 | 9135 |
| carbon tetrachloride | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,1-trichloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethane | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,1,2-trichloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| chloroethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| 2-chloroethylvinyl ether | | <5000 | <5000 | <5000 | <5000 | <5000 | <5000 |
| chloroform | | <250 | <250 | <250 | <250 | <250 | <250 |
| 1,1-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| trans-1,2-dichloroethene | | <100 | <100 | <100 | <100 | <100 | <100 |
| 1,2-dichloropropane | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| trans-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| cis-1,3-dichloropropene | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| methylene chloride | | <50 | <50 | <50 | <50 | <50 | <50 |
| chloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromomethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| bromoform | | <1000 | <1000 | <1000 | <1000 | <1000 | <1000 |
| bromodichloromethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| fluorotrichloromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| dichlorodifluoromethane | | <500 | <500 | <500 | <500 | <500 | <500 |
| chlorodibromomethane | | <250 | <250 | <250 | <250 | <250 | <250 |
| tetrachloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| trichloroethene | | <250 | <250 | <250 | <250 | <250 | <250 |
| vinyl chloride | | <500 | <500 | <500 | <500 | <500 | <500 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/kg as received)

U-3772.10

| Compound | E & E Lab. No. 86- | 5780 | 5781 | | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9136 | 9137 | | | | |
| carbon tetrachloride | | <250 | <250 | | | | |
| 1,2-dichloroethane | | <100 | <100 | | | | |
| 1,1,1-trichloroethane | | <250 | <250 | | | | |
| 1,1-dichloroethane | | <100 | <100 | | | | |
| 1,1,2-trichloroethane | | <500 | <500 | | | | |
| 1,1,2,2-tetrachloroethane | | <250 | <250 | | | | |
| chloroethane | | <500 | <500 | | | | |
| 2-chloroethylvinyl ether | | <5000 | <5000 | | | | |
| chloroform | | <250 | <250 | | | | |
| 1,1-dichloroethene | | <100 | <100 | | | | |
| trans-1,2-dichloroethene | | <100 | <100 | | | | |
| 1,2-dichloropropane | | <1000 | <1000 | | | | |
| trans-1,3-dichloropropene | | <1000 | <1000 | | | | |
| cis-1,3-dichloropropene | | <1000 | <1000 | | | | |
| methylene chloride | | <50 | <50 | | | | |
| chloromethane | | <500 | <500 | | | | |
| bromomethane | | <500 | <500 | | | | |
| bromoform | | <1000 | <1000 | | | | |
| bromodichloromethane | | <250 | <250 | | | | |
| fluorotrichloromethane | | <500 | <500 | | | | |
| dichlorodifluoromethane | | <500 | <500 | | | | |
| chlorodibromomethane | | <250 | <250 | | | | |
| tetrachloroethene | | <250 | <250 | | | | |
| trichloroethene | | <250 | <250 | | | | |
| vinyl chloride | | <500 | <500 | | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3772.11

| Compound | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| carbon tetrachloride | 5769 | <250 | <250 | -- |
| 1,2-dichloroethane | 5769 | <100 | <100 | -- |
| 1,1,1-trichloroethane | 5769 | <250 | <250 | -- |
| 1,1-dichloroethane | 5769 | <100 | <100 | -- |
| 1,1,2-trichloroethane | 5769 | <500 | <500 | -- |
| 1,1,2,2-tetrachloroethane | 5769 | <250 | <250 | -- |
| chloroethane | 5769 | <500 | <500 | -- |
| 2-chloroethylvinyl ether | 5769 | <5000 | <5000 | -- |
| chloroform | 5769 | <250 | <250 | -- |
| 1,1-dichloroethene | 5769 | <100 | <100 | -- |
| trans-1,2-dichloroethene | 5769 | <100 | <100 | -- |
| 1,2-dichloropropane | 5769 | <1000 | <1000 | -- |
| trans-1,3-dichloropropene | 5769 | <1000 | <1000 | -- |
| cis-1,3-dichloropropene | 5769 | <1000 | <1000 | -- |
| methylene chloride | 5769 | <50 | <50 | -- |
| chloromethane | 5769 | <500 | <500 | -- |
| bromomethane | 5769 | <500 | <500 | -- |
| bromoform | 5769 | <1000 | <1000 | -- |
| bromodichloromethane | 5769 | <250 | <250 | -- |
| fluorotrichloromethane | 5769 | <500 | <500 | -- |
| dichlorodifluoromethane | 5769 | <500 | <500 | -- |
| chlorodibromomethane | 5769 | <250 | <250 | -- |
| tetrachloroethene | 5769 | <250 | <250 | -- |
| trichloroethene | 5769 | <250 | <250 | -- |
| vinyl chloride | 5769 | <500 | <500 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3772.12

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| carbon tetrachloride | 5779 | <250 | 1250 | 777.8 | 62.2 |
| 1,2-dichloroethane | 5779 | <100 | 1250 | 992.9 | 79.4 |
| 1,1,1-trichloroethane | 5779 | <250 | 1250 | 902.2 | 72.2 |
| 1,1-dichloroethane | 5779 | <100 | 1250 | 922.2 | 73.8 |
| chloroethane | 5779 | <500 | 1250 | 1225 | 98.0 |
| chloroform | 5779 | <250 | 1250 | 912.4 | 73.0 |
| trans-1,2-dichloroethene | 5779 | <100 | 1250 | 777.8 | 62.2 |
| methylene chloride | 5779 | <50 | 1250 | 845.1 | 67.6 |
| chloromethane | 5779 | <500 | 1250 | 1165 | 93.2 |
| bromomethane | 5779 | <500 | 1250 | 1738 | 139 |
| bromoform | 5779 | <1000 | 1250 | 908.8 | 72.7 |
| bromodichloromethane | 5779 | <250 | 1250 | 782.7 | 62.6 |
| trichloroethene | 5779 | <250 | 1250 | 956.9 | 76.6 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3772.13

| Compound | E & E Lab. No. 86- | 5760 | 5761 | 5762 | 5763 | 5764 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9116 | 9117 | 9118 | 9119 | 9120 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3772.14

| Compound | E & E Lab. No. 86- | 5765 | 5766 | 5767 | 5768 | 5769 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9121 | 9122 | 9123 | 9124 | 9125 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3772.15

| Compound | E & E Lab. No. 86- | 5770 | 5771 | 5772 | 5773 | 5774 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9126 | 9127 | 9128 | 9129 | 9130 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3772.16

| Compound | E & E Lab. No. 86- | 5775 | 5776 | 5777 | 5778 | 5779 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9131 | 9132 | 9133 | 9134 | 9135 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3772.17

| Compound | E & E Lab. No. 86- | 5780 | 5781 | Blank | Blank | Blank |
|---|---|---|---|---|---|---|
| | Sample Identity | 9136 | 9137 | 7/30/86 | 7/30/86 | 7/31/86 |
| chlorobenzene | | <250 | <250 | <250 | <250 | <250 |
| 1,2-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,3-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| 1,4-dichlorobenzene | | <500 | <500 | <500 | <500 | <500 |
| benzene | | <250 | <250 | <250 | <250 | <250 |
| total xylenes | | <500 | <500 | <500 | <500 | <500 |
| toluene | | <250 | <250 | <250 | <250 | <250 |
| ethylbenzene | | <250 | <250 | <250 | <250 | <250 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/kg as received)

U-3772.18

| Compound | E & E Lab. No. 86- | Blank | | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/1/86 | | | | |
| chlorobenzene | | <250 | | | | |
| 1,2-dichlorobenzene | | <500 | | | | |
| 1,3-dichlorobenzene | | <500 | | | | |
| 1,4-dichlorobenzene | | <500 | | | | |
| benzene | | <250 | | | | |
| total xylenes | | <500 | | | | |
| toluene | | <250 | | | | |
| ethylbenzene | | <250 | | | | |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3772.19

| Parameter | E & E Laboratory No. 86- | (ug/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | 5772 | <250 | <250 | -- |
| 1,2-dichlorobenzene | 5772 | <500 | <500 | -- |
| 1,3-dichlorobenzene | 5772 | <500 | <500 | -- |
| 1,4-dichlorobenzene | 5772 | <500 | <500 | -- |
| benzene | 5772 | <250 | <250 | -- |
| total xylenes | 5772 | <500 | <500 | -- |
| toluene | 5772 | <250 | <250 | -- |
| ethyl benzene | 5772 | <250 | <250 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3772.20

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/kg) | | | |
| 1,2-dichlorobenzene | 5781 | <500 | 1250 | 1230 | 98 |
| 1,3-dichlorobenzene | 5781 | <500 | 1250 | 1232 | 99 |
| 1,4-dichlorobenzene | 5781 | <500 | 1250 | 1234 | 99 |
| toluene | 5781 | <250 | 1250 | 1254 | 100 |
| ethyl benzene | 5781 | <250 | 1250 | 1253 | 100 |

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.21

| Compound | E & E Lab. No. 86- | 5760 | 5761 | 5762 | 5763 | 5764 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9116 | 9117 | 9118 | 9119 | 9120 |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <1 | <1 |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <1 | <1 |
| hexachloroethane | | <1 | <1 | <1 | <1 | <1 |
| nitrobenzene | | <1 | <1 | <1 | <1 | <1 |
| isophorone | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <1 | <1 |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| naphthalene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobutadiene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <1 | <1 |
| 2-chloronaphthalene | | <1 | <1 | <1 | <1 | <1 |
| dimethyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| acenaphthylene | | <1 | <1 | <1 | <1 | <1 |
| fluorene | | <1 | <1 | <1 | <1 | <1 |
| acenaphthene | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| diethylphthalate | | <1 | <1 | <1 | <1 | <1 |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <1 | <1 |
| 4-bromophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| phenanthrene | | <1 | <1 | <1 | <1 | <1 |
| anthracene | | <1 | <1 | <1 | <1 | <1 |
| di-n-butyl phthalate | | <1 | 4.1 | <1 | <1 | <1 |
| fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzidine | | <5 | <5 | <5 | <5 | <5 |
| pyrene | | <1 | <1 | <1 | <1 | <1 |
| butyl benzyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <3 | <3 |
| benzo(a)anthracene | | <1 | <1 | <1 | *<1 | <1 |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | <1 | <1 | <1 |
| chrysene | | <1 | <1 | <1 | <1 | <1 |
| di-n-octyl phthalate | | <1 | <1 | <1 | <1* | <1 |
| benzo(b)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(a)pyrene | | <1 | <1 | <1 | <1 | <1 |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <1 | <1 |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <1 | <1 |
| benzo(ghi)perylene | | <1 | <1 | <1 | <1 | <1 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.22

| Compound | E & E Lab. No. 86- | 5765 | 5766 | 5767 | 5768 | 5769 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9121 | 9122 | 9123 | 9124 | 9125 |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <1 | <1 |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <1 | <1 |
| hexachloroethane | | <1 | <1 | <1 | <1 | <1 |
| nitrobenzene | | <1 | <1 | <1 | <1 | <1 |
| isophorone | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <1 | <1 |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| naphthalene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobutadiene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <1 | <1 |
| 2-chloronaphthalene | | <1 | <1 | <1 | <1 | <1 |
| dimethyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| acenaphthylene | | <1 | <1 | <1 | <1 | <1 |
| fluorene | | <1 | <1 | <1 | <1 | <1 |
| acenaphthene | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| diethylphthalate | | <1 | <1 | <1 | <1 | <1 |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <1 | <1 |
| 4-bromophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| phenanthrene | | <1 | <1 | <1 | <1 | <1 |
| anthracene | | <1 | <1 | <1 | <1 | <1 |
| di-n-butyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzidine | | <5 | <5 | <5 | <5 | <5 |
| pyrene | | <1 | <1 | <1 | <1 | <1 |
| butyl benzyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <3 | <3 |
| benzo(a)anthracene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | <1 | <1 | <1 |
| chrysene | | <1 | <1 | <1 | <1 | <1 |
| di-n-octyl phthalate | | <1 | <1 | <1* | 1.8 | <1 |
| benzo(b)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(a)pyrene | | <1 | <1 | <1 | <1 | <1 |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <1 | <1 |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <1 | <1 |
| benzo(ghi)perylene | | <1 | <1 | <1 | <1 | <1 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.23

| Compound | E & E Lab. No. 86- | 5770 | 5771 | 5772 | 5773 | 5774 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9126 | 9127 | 9128 | 9129 | 9130 |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <1 | <1 |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <1 | <1 |
| hexachloroethane | | <1 | <1 | <1 | <1 | <1 |
| nitrobenzene | | <1 | <1 | <1 | <1 | <1 |
| isophorone | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <1 | <1 |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| naphthalene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobutadiene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <1 | <1 |
| 2-chloronaphthalene | | <1 | <1 | <1 | <1 | <1 |
| dimethyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| acenaphthylene | | <1 | <1 | <1 | <1 | <1 |
| fluorene | | <1 | <1 | <1 | <1 | <1 |
| acenaphthene | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| diethylphthalate | | <1 | <1 | <1 | <1 | <1 |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <1 | <1 |
| 4-bromophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| phenanthrene | | <1 | <1 | <1 | <1 | <1 |
| anthracene | | <1 | <1 | <1 | <1 | <1 |
| di-n-butyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzidine | | <5 | <5 | <5 | <5 | <5 |
| pyrene | | <1 | <1 | <1 | <1 | <1 |
| butyl benzyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <3 | <3 |
| benzo(a)anthracene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | 2.9 | <1 | <1 |
| chrysene | | <1 | <1 | <1 | <1 | <1 |
| di-n-octyl phthalate | | 1.8 | 8.0 | 3.2 | 2.5 | <1* |
| benzo(b)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(a)pyrene | | <1 | <1 | <1 | <1 | <1 |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <1 | <1 |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <1 | <1 |
| benzo(ghi)perylene | | <1 | <1 | <1 | <1 | <1 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.24

| Compound | E & E Lab. No. 86- | 5775 | 5776 | 5777 | 5778 | 5779 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9131 | 9132 | 9133 | 9134 | 9135 |
| bis(2-chloroethyl)ether | | <1 | <1 | <1 | <1 | <1 |
| 1,3-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,4-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| 1,2-dichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodipropylamine | | <1 | <1 | <1 | <1 | <1 |
| hexachloroethane | | <1 | <1 | <1 | <1 | <1 |
| nitrobenzene | | <1 | <1 | <1 | <1 | <1 |
| isophorone | | <1 | <1 | <1 | <1 | <1 |
| bis(2-chloroethoxy)methane | | <1 | <1 | <1 | <1 | <1 |
| 1,2,4-trichlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| naphthalene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobutadiene | | <1 | <1 | <1 | <1 | <1 |
| hexachlorocyclopentadiene | | <1 | <1 | <1 | <1 | <1 |
| 2-chloronaphthalene | | <1 | <1 | <1 | <1 | <1 |
| dimethyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| acenaphthylene | | <1 | <1 | <1 | <1 | <1 |
| fluorene | | <1 | <1 | <1 | <1 | <1 |
| acenaphthene | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| 2,6-dinitrotoluene | | <1 | <1 | <1 | <1 | <1 |
| diethylphthalate | | <1 | <1 | <1 | <1 | <1 |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| N-nitrosodiphenylamine | | <1 | <1 | <1 | <1 | <1 |
| 4-bromophenyl phenyl ether | | <1 | <1 | <1 | <1 | <1 |
| hexachlorobenzene | | <1 | <1 | <1 | <1 | <1 |
| phenanthrene | | <1 | <1 | <1 | <1 | <1 |
| anthracene | | <1 | <1 | <1 | <1 | <1 |
| di-n-butyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzidine | | <5 | <5 | <5 | <5 | <5 |
| pyrene | | <1 | <1 | <1 | <1 | <1 |
| butyl benzyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| 3,3'-dichlorobenzidine | | <3 | <3 | <3 | <3 | <3 |
| benzo(a)anthracene | | <1 | <1 | <1 | <1 | <1 |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | <1 | <1 | <1 |
| chrysene | | <1 | <1 | <1 | <1 | <1 |
| di-n-octyl phthalate | | <1 | <1 | <1 | <1 | <1 |
| benzo(b)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(k)fluoranthene | | <1 | <1 | <1 | <1 | <1 |
| benzo(a)pyrene | | <1 | <1 | <1 | <1 | <1 |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <1 | <1 | <1 |
| dibenzo(a,h)anthracene | | <1 | <1 | <1 | <1 | <1 |
| benzo(ghi)perylene | | <1 | <1 | <1 | <1 | <1 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.25

| Compound | E & E Lab. No. 86- | 5780 | 5781 | Method Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9136 | 9137 | ug/L | | |
| bis(2-chloroethyl)ether | | <1 | <1 | <10 | | |
| 1,3-dichlorobenzene | | <1 | <1 | <10 | | |
| 1,4-dichlorobenzene | | <1 | <1 | <10 | | |
| 1,2-dichlorobenzene | | <1 | <1 | <10 | | |
| bis(2-chloroisopropyl)ether | | <1 | <1 | <10 | | |
| N-nitrosodipropylamine | | <1 | <1 | <10 | | |
| hexachloroethane | | <1 | <1 | <10 | | |
| nitrobenzene | | <1 | <1 | <10 | | |
| isophorone | | <1 | <1 | <10 | | |
| bis(2-chloroethoxy)methane | | <1 | <1 | <10 | | |
| 1,2,4-trichlorobenzene | | <1 | <1 | <10 | | |
| naphthalene | | <1 | <1 | <10 | | |
| hexachlorobutadiene | | <1 | <1 | <10 | | |
| hexachlorocyclopentadiene | | <1 | <1 | <10 | | |
| 2-chloronaphthalene | | <1 | <1 | <10 | | |
| dimethyl phthalate | | <1 | <1 | <10 | | |
| acenaphthylene | | <1 | <1 | <10 | | |
| fluorene | | <1 | <1 | <10 | | |
| acenaphthene | | <1 | <1 | <10 | | |
| 2,4-dinitrotoluene | | <1 | <1 | <10 | | |
| 2,6-dinitrotoluene | | <1 | <1 | <10 | | |
| diethylphthalate | | <1 | <1 | <10 | | |
| 4-chlorophenyl phenyl ether | | <1 | <1 | <10 | | |
| N-nitrosodiphenylamine | | <1 | <1 | <10 | | |
| 4-bromophenyl phenyl ether | | <1 | <1 | <10 | | |
| hexachlorobenzene | | <1 | <1 | <10 | | |
| phenanthrene | | <1 | <1 | <10 | | |
| anthracene | | <1 | <1 | <10 | | |
| di-n-butyl phthalate | | <1 | <1 | <10 | | |
| fluoranthene | | <1 | <1 | <10 | | |
| benzidine | | <5 | <5 | <50 | | |
| pyrene | | <1 | <1 | <10 | | |
| butyl benzyl phthalate | | <1 | <1 | <10 | | |
| 3,3'-dichlorobenzidine | | <3 | <3 | <30 | | |
| benzo(a)anthracene | | <1 | <1 | <10 | | |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | <10 | | |
| chrysene | | <1 | <1 | <10 | | |
| di-n-octyl phthalate | | <1 | <1 | <10 | | |
| benzo(b)fluoranthene | | <1 | <1 | <10 | | |
| benzo(k)fluoranthene | | <1 | <1 | <10 | | |
| benzo(a)pyrene | | <1 | <1 | <10 | | |
| indeno(1,2,3-cd)pyrene | | <1 | <1 | <10 | | |
| dibenzo(a,h)anthracene | | <1 | <1 | <10 | | |
| benzo(ghi)perylene | | <1 | <1 | <10 | | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.26

| Compound | E & E Lab. No. 86- | 5760 | 5761 | 5762 | 5763 | 5764 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9116 | 9117 | 9118 | 9119 | 9120 |
| phenol | | <1 | <1 | <1 | <1 | <1 |
| 2-chlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <3 | <3 |
| 4-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <3 | <3 |
| pentachlorophenol | | <3 | <3 | <3 | <3 | <3 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.27

| Compound | E & E Lab. No. 86- | 5765 | 5766 | 5767 | 5768 | 5769 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9121 | 9122 | 9123 | 9124 | 9125 |
| phenol | | <1 | <1 | <1 | <1 | <1 |
| 2-chlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <3 | <3 |
| 4-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <3 | <3 |
| pentachlorophenol | | <3 | <3 | <3 | <3 | <3 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.28

| Compound | E & E Lab. No. 86- | 5770 | 5771 | 5772 | 5773 | 5774 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9126 | 9127 | 9128 | 9129 | 9130 |
| phenol | | <1 | <1 | <1 | <1 | <1 |
| 2-chlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <3 | <3 |
| 4-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <3 | <3 |
| pentachlorophenol | | <3 | <3 | <3 | <3 | <3 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.29

| Compound | E & E Lab. No. 86- | 5775 | 5776 | 5777 | 5778 | 5779 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9131 | 9132 | 9133 | 9134 | 9135 |
| phenol | | <1 | <1 | <1 | <1 | <1 |
| 2-chlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dimethylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 4-chloro-3-methylphenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4,6-trichlorophenol | | <1 | <1 | <1 | <1 | <1 |
| 2,4-dinitrophenol | | <3 | <3 | <3 | <3 | <3 |
| 4-nitrophenol | | <1 | <1 | <1 | <1 | <1 |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <3 | <3 | <3 |
| pentachlorophenol | | <3 | <3 | <3 | <3 | <3 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF SOIL ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in mg/kg, as received)

U-3772.30

| Compound | E & E Lab. No. 86- | 5780 | 5781 | Method Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9136 | 9137 | ug/L | | |
| phenol | | <1 | <1 | <10 | | |
| 2-chlorophenol | | <1 | <1 | <10 | | |
| 2-nitrophenol | | <1 | <1 | <10 | | |
| 2,4-dimethylphenol | | <1 | <1 | <10 | | |
| 2,4-dichlorophenol | | <1 | <1 | <10 | | |
| 4-chloro-3-methylphenol | | <1 | <1 | <10 | | |
| 2,4,6-trichlorophenol | | <1 | <1 | <10 | | |
| 2,4-dinitrophenol | | <3 | <3 | <30 | | |
| 4-nitrophenol | | <1 | <1 | <10 | | |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | <30 | | |
| pentachlorophenol | | <3 | <3 | <30 | | |

*Compound present below measurable detection limit.

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

U-3772.31

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| nitrobenzene-D5 | 5760 | 3.3 | 1.6 | 48.5 |
| | 5761 | 3.3 | 2.4 | 72.7 |
| | 5762 | 3.3 | 2.2 | 66.7 |
| | 5763 | 3.3 | 1.8 | 54.5 |
| | 5764 | 3.3 | 1.8 | 54.5 |
| | 5765 | 3.3 | 2.7 | 81.8 |
| | 5766 | 3.3 | 2.2 | 66.7 |
| | 5767 | 3.3 | 2.1 | 63.6 |
| | 5768 | 3.3 | 2.7 | 81.8 |
| | 5769 | 3.3 | 2.1 | 63.6 |
| | 5770 | 3.3 | 2.5 | 75.6 |
| | 5771 | 3.3 | 2.1 | 63.6 |
| | 5772 | 3.3 | 2.5 | 75.6 |
| | 5773 | 3.3 | 2.2 | 66.7 |
| | 5774 | 3.3 | 2.8 | 84.8 |
| | 5775 | 3.3 | 1.5 | 45.5 |
| | 5776 | 3.3 | 1.9 | 57.6 |
| | 5777 | 3.3 | 1.9 | 57.6 |
| | 5778 | 3.3 | 1.8 | 54.5 |
| | 5779 | 3.3 | 1.8 | 54.5 |
| | 5780 | 3.3 | 1.9 | 57.6 |
| | 5781 | 3.3 | 2.4 | 72.7 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3772.32

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| 2-fluorobiphenyl | 5760 | 3.3 | 2.9 | 87.9 |
| | 5761 | 3.3 | 3.8 | 115 |
| | 5762 | 3.3 | 3.5 | 106 |
| | 5763 | 3.3 | 3.0 | 90.9 |
| | 5764 | 3.3 | 2.8 | 84.8 |
| | 5765 | 3.3 | 3.7 | 112 |
| | 5766 | 3.3 | 3.5 | 106 |
| | 5767 | 3.3 | 3.3 | 100 |
| | 5768 | 3.3 | 3.7 | 112 |
| | 5769 | 3.3 | 3.5 | 106 |
| | 5770 | 3.3 | 3.7 | 112 |
| | 5771 | 3.3 | 3.2 | 97.0 |
| | 5772 | 3.3 | 3.1 | 93.9 |
| | 5773 | 3.3 | 3.1 | 93.9 |
| | 5774 | 3.3 | 3.7 | 112 |
| | 5775 | 3.3 | 2.2 | 66.7 |
| | 5776 | 3.3 | 2.2 | 66.7 |
| | 5777 | 3.3 | 2.4 | 72.7 |
| | 5778 | 3.3 | 2.5 | 75.8 |
| | 5779 | 3.3 | 2.4 | 72.7 |
| | 5780 | 3.3 | 2.2 | 66.7 |
| | 5781 | 3.3 | 3.2 | 97.0 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3772.33

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| terphenyl-D14 | 5760 | 3.3 | 1.3 | 39.4 |
| | 5761 | 3.3 | 1.5 | 45.5 |
| | 5762 | 3.3 | 1.5 | 45.5 |
| | 5763 | 3.3 | 1.2 | 36.4 |
| | 5764 | 3.3 | 1.5 | 45.5 |
| | 5765 | 3.3 | 2.3 | 69.7 |
| | 5766 | 3.3 | 1.5 | 45.5 |
| | 5767 | 3.3 | 1.8 | 54.5 |
| | 5768 | 3.3 | 2.6 | 78.8 |
| | 5769 | 3.3 | 1.4 | 42.4 |
| | 5770 | 3.3 | 1.7 | 51.5 |
| | 5771 | 3.3 | 2.9 | 87.9 |
| | 5772 | 3.3 | 2.2 | 66.7 |
| | 5773 | 3.3 | 2.2 | 66.7 |
| | 5774 | 3.3 | 2.9 | 87.9 |
| | 5775 | 3.3 | 1.5 | 45.5 |
| | 5776 | 3.3 | 1.5 | 45.5 |
| | 5777 | 3.3 | 1.6 | 48.5 |
| | 5778 | 3.3 | 1.6 | 48.5 |
| | 5779 | 3.3 | 1.6 | 48.5 |
| | 5780 | 3.3 | 1.4 | 42.4 |
| | 5781 | 3.3 | 2.4 | 72.7 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3772.34

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| phenol-D5 | 5760 | 6.6 | 2.2 | 33.3 |
| | 5761 | 6.6 | 3.1 | 47.0 |
| | 5762 | 6.6 | 3.2 | 48.5 |
| | 5763 | 6.6 | 2.5 | 37.9 |
| | 5764 | 6.6 | 2.4 | 36.4 |
| | 5765 | 6.6 | 3.3 | 50.0 |
| | 5766 | 6.6 | 3.2 | 48.5 |
| | 5767 | 6.6 | 3.2 | 48.5 |
| | 5768 | 6.6 | 3.4 | 51.5 |
| | 5769 | 6.6 | 2.7 | 40.9 |
| | 5770 | 6.6 | 3.3 | 50.0 |
| | 5771 | 6.6 | 2.3 | 34.8 |
| | 5772 | 6.6 | 3.0 | 45.5 |
| | 5773 | 6.6 | 2.6 | 39.4 |
| | 5774 | 6.6 | 3.8 | 57.6 |
| | 5775 | 6.6 | 2.0 | 30.3 |
| | 5776 | 6.6 | 1.9 | 28.8 |
| | 5777 | 6.6 | 2.5 | 37.9 |
| | 5778 | 6.6 | 2.0 | 30.3 |
| | 5779 | 6.6 | 2.4 | 36.4 |
| | 5780 | 6.6 | 2.1 | 31.8 |
| | 5781 | 6.6 | 2.8 | 42.4 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3772.35

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| 2-fluorophenol | 5760 | 6.6 | 1.6 | 24.2 |
| | 5761 | 6.6 | 1.8 | 27.3 |
| | 5762 | 6.6 | 2.8 | 42.4 |
| | 5763 | 6.6 | 1.8 | 27.3 |
| | 5764 | 6.6 | 1.8 | 27.3 |
| | 5765 | 6.6 | 2.4 | 36.4 |
| | 5766 | 6.6 | 3.0 | 45.5 |
| | 5767 | 6.6 | 2.2 | 33.3 |
| | 5768 | 6.6 | 2.4 | 36.4 |
| | 5769 | 6.6 | 2.0 | 30.3 |
| | 5770 | 6.6 | 2.5 | 37.9 |
| | 5771 | 6.6 | 1.9 | 28.8 |
| | 5772 | 6.6 | 2.1 | 31.8 |
| | 5773 | 6.6 | 1.7 | 25.8 |
| | 5774 | 6.6 | 2.8 | 42.4 |
| | 5775 | 6.6 | 1.5 | 22.7 |
| | 5776 | 6.6 | 1.9 | 28.8 |
| | 5777 | 6.6 | 2.7 | 40.9 |
| | 5778 | 6.6 | 2.0 | 30.3 |
| | 5779 | 6.6 | 2.1 | 31.8 |
| | 5780 | 6.6 | 1.8 | 27.3 |
| | 5781 | 6.6 | 2.2 | 33.3 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3772.36

| Compound | E & E Laboratory No. 86- | Amount Added (mg/kg) | Amount Determined (mg/kg) | Percent Recovery |
|---|---|---|---|---|
| 2,4,6-tribromophenol | 5760 | 6.6 | 1.5 | 22.7 |
| | 5761 | 6.6 | 2.6 | 39.4 |
| | 5762 | 6.6 | 2.4 | 36.4 |
| | 5763 | 6.6 | 2.1 | 31.8 |
| | 5764 | 6.6 | 2.4 | 36.4 |
| | 5765 | 6.6 | 2.5 | 37.9 |
| | 5766 | 6.6 | 1.9 | 28.8 |
| | 5767 | 6.6 | 2.9 | 43.9 |
| | 5768 | 6.6 | 2.8 | 42.4 |
| | 5769 | 6.6 | 1.5 | 22.7 |
| | 5770 | 6.6 | 2.0 | 30.3 |
| | 5771 | 6.6 | 3.2 | 48.5 |
| | 5772 | 6.6 | 3.6 | 54.5 |
| | 5773 | 6.6 | 1.9 | 28.8 |
| | 5774 | 6.6 | 3.3 | 50.0 |
| | 5775 | 6.6 | 1.4 | 21.2 |
| | 5776 | 6.6 | 1.8 | 27.2 |
| | 5777 | 6.6 | 2.2 | 33.3 |
| | 5778 | 6.6 | 2.0 | 30.3 |
| | 5779 | 6.6 | 1.8 | 27.2 |
| | 5780 | 6.6 | 1.4 | 21.2 |
| | 5781 | 6.6 | 4.2 | 63.6 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3772.37

| Compound | E & E Lab. No. 86-5760 | mg/kg | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| bis(2-chloroethyl)ether | | <1 | <1 | -- |
| 1,3-dichlorobenzene | | <1 | <1 | -- |
| 1,4-dichlorobenzene | | <1 | <1 | -- |
| 1,2-dichlorobenzene | | <1 | <1 | -- |
| bis(2-chloroisopropyl)ether | | <1 | <1 | -- |
| N-nitrosodipropylamine | | <1 | <1 | -- |
| hexachloroethane | | <1 | <1 | -- |
| nitrobenzene | | <1 | <1 | -- |
| isophorone | | <1 | <1 | -- |
| bis(2-chloroethoxy)methane | | <1 | <1 | -- |
| 1,2,4-trichlorobenzene | | <1 | <1 | -- |
| naphthalene | | <1 | <1 | -- |
| hexachlorobutadiene | | <1 | <1 | -- |
| hexachlorocyclopentadiene | | <1 | <1 | -- |
| 2-chloronaphthalene | | <1 | <1 | -- |
| dimethyl phthalate | | <1 | <1 | -- |
| acenaphthylene | | <1 | <1 | -- |
| fluorene | | <1 | <1 | -- |
| acenaphthene | | <1 | <1 | -- |
| 2,4-dinitrotoluene | | <1 | <1 | -- |
| 2,6-dinitrotoluene | | <1 | <1 | -- |
| diethylphthalate | | <1 | <1 | -- |
| 4-chlorophenyl phenyl ether | | <1 | <1 | -- |
| N-nitrosodiphenylamine | | <1 | <1 | -- |
| 4-bromophenyl phenyl ether | | <1 | <1 | -- |
| hexachlorobenzene | | <1 | <1 | -- |
| phenanthrene | | <1 | <1 | -- |
| anthracene | | <1 | <1 | -- |
| di-n-butyl phthalate | | <1 | <1 | -- |
| fluoranthene | | <1 | <1 | -- |
| benzidine | | <5 | <5 | -- |
| pyrene | | <1 | <1 | -- |
| butyl benzyl phthalate | | <1 | <1 | -- |
| 3,3'-dichlorobenzidine | | <3 | <3 | -- |
| benzo(a)anthracene | | <1 | <1 | -- |
| bis(2-ethylhexyl)phthalate | | <1 | <1 | -- |
| chrysene | | <1 | <1 | -- |
| di-n-octyl phthalate | | <1 | <1 | -- |
| benzo(b)fluoranthene | | <1 | <1 | -- |
| benzo(k)fluoranthene | | <1 | <1 | -- |
| benzo(a)pyrene | | <1 | <1 | -- |
| indeno(1,2,3-c,d)pyrene | | <1 | <1 | -- |
| dibenzo(a,h)anthracene | | <1 | <1 | -- |
| benzo(g,h,i)perylene | | <1 | <1 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3772.38

| Compound | E & E Lab. No. 86-5760 | mg/kg | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| phenol | | <1 | <1 | -- |
| 2-chlorophenol | | <1 | <1 | -- |
| 2-nitrophenol | | <1 | <1 | -- |
| 2,4-dimethylphenol | | <1 | <1 | -- |
| 2,4-dichlorophenol | | <1 | <1 | -- |
| 4-chloro-3-methylphenol | | <1 | <1 | -- |
| 2,4,6-trichlorophenol | | <1 | <1 | -- |
| 2,4-dinitrophenol | | <3 | <3 | -- |
| 4-nitrophenol | | <1 | <1 | -- |
| 4,6-dinitro-2-methylphenol | | <3 | <3 | -- |
| pentachlorophenol | | <3 | <3 | -- |

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY--EPA QUALITY ASSURANCE MATERIALS
SOLUTION ADDED TO SAMPLE #5776
PRIOR TO EXTRACTION

U-3772.39

| Compound | True Value (ng) | Amount Determined (ng) | Percent Recovery |
|---|---|---|---|
| 1,4-dichlorobenzene | 251 | 126 | 50 |
| bis(2-chloroisopropyl) ether | 204 | 145 | 71 |
| hexachloroethane | 303 | 170 | 56 |
| nitrobenzene | 373 | 206 | 55 |
| naphthalene | 250 | 128 | 51 |
| dimethyl phthalate | 404 | 226 | 56 |
| acenaphthene | 197 | 107 | 54 |
| fluorene | 250 | 121 | 48 |
| 4-chlorophenyl phenyl ether | 374 | 181 | 48 |
| 4-bromophenyl phenyl ether | 373 | 231 | 62 |
| anthracene | 200 | 102 | 51 |
| fluoranthene | 301 | 159 | 53 |
| butylbenzylphthalate | 250 | 134 | 54 |
| chrysene | 209 | 93 | 44 |
| bis(2-ethylhexyl)phthalate | 153 | 80 | 52 |
| benzo(b)fluoranthene | 203 | 98 | 48 |
| benzo(a)pyrene | 224 | 110 | 49 |
| dibenzo(a,h)anthracene | 204 | 115 | 56 |
| benzo(g,h,i)perylene | 300 | 137 | 46 |

All these recoveries are acceptable to EPA guidelines.

QUALITY CONTROL FOR ACCURACY:
PERCENT RECOVERY--EPA QUALITY ASSURANCE MATERIALS
SOLUTION ADDED TO SAMPLE #5776
PRIOR TO EXTRACTION

U-3772.40

| Compound | True Value (ng) | Amount Determined (ng) | Percent Recovery |
|---|---|---|---|
| 2-chlorophenol | 300 | 150 | 50 |
| 2-nitrophenol | 250 | 153 | 61 |
| phenol | 250 | 105 | 42 |
| 2,4-dimethylphenol | 150 | 87 | 58 |
| 2,4-dichlorophenol | 250 | 145 | 58 |
| 2,4,6-trichlorophenol | 250 | 146 | 58 |
| 4-chloro-3-methylphenol | 225 | 125 | 56 |
| 2-methyl-4,6-dinitrophenol | 750 | 65 | 8.7 |
| pentachlorophenol | 375 | 159 | 42 |
| 4-nitrophenol | 250 | 4.6 | 1.8 |

With the exception of 4-nitrophenol and 2-methyl-4,6-dinitrophenol, these recoveries are acceptable to EPA guidelines.

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3772.41

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Arsenic | 46.0 | 44.8 | 2.6 |
| | 46.0 | 49.0 | 6.5 |
| Cadmium | 940 | 913 | 2.9 |
| Chromium | 1030 | 955 | 7.3 |
| Copper | 1030 | 937 | 9.0 |
| Lead | 53.0 | 52.5 | 0.9 |
| Nickel | 1020 | 943 | 7.5 |
| Zinc | 1010 | 964 | 4.6 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF SOIL SAMPLES

U-3772.42

| Parameter | E & E Laboratory No. 86- | (mg/kg) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Solids | 5763 | 96 | 96 | 0 |
| | 5773 | 96 | 96 | 0 |
| Arsenic | 5775 | <5.2 | <5.2 | -- |
| Cadmium | 5775 | <0.5 | <0.5 | -- |
| Chromium | 5775 | 12.4 | 10.6 | 15.7 |
| Copper | 5775 | 8.25 | 8.06 | 2.3 |
| Lead | 5775 | 12.0 | 19.3 | 46.6 |
| Nickel | 5775 | <10 | <10 | -- |
| Zinc | 5775 | 47.5 | 43.1 | 9.7 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED SOIL SAMPLES

U-3772.43

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/kg) | | | |
| Oil and Grease | 5769 | 740 | 1550 | 2720 | 128 |
| | 5779 | 140 | 1560 | 2220 | 133 |
| | 5781 | <100 | 1550 | 2040 | 132 |
| Arsenic* | 5765 | <0.005 | 0.025 | 0.029 | 116 |
| | 5774 | <0.005 | 0.025 | 0.028 | 112 |
| Cadmium* | 5765 | <0.005 | 1.0 | 0.889 | 88.9 |
| | 5774 | <0.005 | 1.0 | 0.901 | 90.1 |
| Chromium* | 5765 | 0.101 | 1.0 | 1.04 | 93.9 |
| | 5774 | 0.116 | 1.0 | 1.05 | 93.4 |
| Copper* | 5765 | 0.074 | 1.0 | 1.01 | 93.6 |
| | 5774 | 0.080 | 1.0 | 1.02 | 94.0 |
| Lead* | 5765 | 0.010 | 0.025 | 0.032 | 88.0 |
| | 5774 | 0.021 | 0.025 | 0.044 | 92.0 |
| Nickel* | 5765 | <0.1 | 1.0 | 0.983 | 98.3 |
| | 5774 | <0.1 | 1.0 | 0.982 | 98.2 |
| Zinc* | 5765 | 0.299 | 1.0 | 1.18 | 88.1 |
| | 5774 | 0.328 | 1.0 | 1.23 | 90.2 |

*Results in mg/L because spiking is performed during digestion procedure.

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-3986.6

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 7348 | 9010 | 0165-PG-001-GP-86-9010 |
| 7349 | 9031 | 0165-PG-002-GP-86-9031 |
| 7350 | 9073 | 0165-PG-004-GP-86-9073 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3986.7

| Job | Sample Number | Sample Date | PAH (7/S + 30) | | | | BNA(7/E + 40) | | | | IDS (7) | | O&G(28) | | Pet. HC(28) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Extraction | | Analysis | | Extraction | | Analysis | | | | | | | |
| | | | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Anal | Dead | Anal | Dead | Anal |
| 3986 | 7348 | 8/20 | -- | -- | -- | -- | 8/27 | 8/22 | 10/1 | 8/29 | 8/27 | 8/25 | 9/17 | 9/12 | -- | -- |
| | 7349 | 8/20 | -- | -- | -- | -- | 8/27 | 8/22 | 10/1 | 8/29 | 8/27 | 8/25 | 9/17 | 9/12 | -- | -- |
| | 7350 | 8/20 | -- | -- | -- | -- | 8/27 | 8/22 | 10/1 | 8/29 | 8/27 | 8/25 | 9/17 | 9/12 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L, as received)

U-3986

| Compound | E & E Lab. No. 86- | Blank | 7348* | 7349* | 7350* | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/21/86 | 9010 | 9031 | 9073 | |
| chlorobenzene | | <0.20 | <0.20 | <0.20 | <0.20 | |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | <0.40 | <0.40 | |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | <0.40 | <0.40 | |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | <0.30 | <0.30 | |
| benzene | | <0.20 | <0.20 | <0.20 | <0.20 | |
| total xylenes | | <1.0 | <1. | <1.0 | <1.0 | |
| toluene | | <0.20 | 3.9 | 6.8 | 3.2 | |
| ethylbenzene | | <0.20 | <0.20 | <0.20 | <0.20 | |

*Samples confirmed - results positive.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/L)

U-3986.1

| | E & E Lab. No. 86- | Blank | 7348 | 7349 | 7350 | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 8/22/86 | 9010 | 9031 | 9073 | | | |
| Naled | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Phorate | | <0.15 | <0.15 | <0.15 | <0.15 | | | |
| Disulfoton | | <0.20 | <0.20 | <0.20 | <0.20 | | | |
| Chlorpyrifos | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Dimethoate | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Malathion | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Mevinphos | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Parathion | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Methyl parathion | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Diazinon | | <0.60 | <0.60 | <0.60 | <0.60 | | | |
| Methyl azinphos | | <1.5 | <1.5 | <1.5 | <1.5 | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/L)

U-3986.2

| Compound | E & E Lab. No. 86- | Blank | Blank | 7348* | 7349 | 7350* | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 8/21/86 | 8/22/86 | 9010 | 9031 | 9073 | |
| carbon tetrachloride | | <0.12 | <0.12 | <0.12 | <0.12 | <1.2 | |
| 1,2-dichloroethane | | <0.03 | <0.03 | <0.03 | <0.03 | <0.30 | |
| 1,1,1-trichloroethane | | <0.03 | <0.03 | <0.03 | <0.03 | <0.30 | |
| 1,1-dichloroethane | | <0.07 | <0.07 | <0.07 | <0.07 | <0.70 | |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | <0.03 | <0.03 | <0.30 | |
| chloroethane | | <0.52 | <0.52 | <0.52 | <0.52 | <5.2 | |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | <0.13 | <0.13 | <1.3 | |
| chloroform | | <0.05 | <0.05 | <0.05 | <0.05 | <0.50 | |
| 1,1-dichloroethene | | <0.13 | <0.13 | <0.13 | <0.13 | <1.3 | |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | <0.10 | <0.10 | <1.0 | |
| 1,2-dichloropropane | | <0.04 | <0.04 | <0.04 | <0.04 | <0.40 | |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | <0.34 | <0.34 | <3.4 | |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | <0.20 | <0.20 | <2.0 | |
| methylene chloride | | 3.6 | <0.25 | <0.25 | <0.25 | <2.5 | |
| chloromethane | | <0.08 | <0.08 | <0.08 | <0.08 | <0.80 | |
| bromomethane | | <1.18 | <1.18 | <1.18 | <1.18 | <11.8 | |
| bromoform | | <0.20 | <0.20 | <0.20 | <0.20 | <2.0 | |
| bromodichloromethane | | <0.10 | <0.10 | <0.10 | <0.10 | <1.0 | |
| fluorotrichloromethane | | <2.0 | <2.0 | <2.0 | <2.0 | <20 | |
| dichlorodifluoromethane | | <1.81 | <1.81 | <1.81 | <1.81 | <18.1 | |
| chlorodibromomethane | | <0.09 | <0.09 | <0.09 | <0.09 | <0.90 | |
| tetrachloroethene | | <0.03 | <0.03 | <0.03 | <0.03 | <0.30 | |
| trichloroethene | | <0.12 | <0.12 | 0.27 | <0.12 | 41 | |
| vinyl chloride | | <0.18 | <0.18 | <0.18 | <0.18 | <1.8 | |

*Sample confirmed - results positive
NOTE: Due to low level artifacts present in the methanol used for internal standard preparation, all samples have been blank subtracted. The actual value of the blank has been reported.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3986.3

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 2,4-D | D.I. Spike | <0.50 | 10.0 | 9.3 | 93 |
| Silvex (2,4,5-TD) | D.I. Spike | <0.05 | 10.0 | 7.7 | 77 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PRIORITY POLLUTANT PESTICIDES, PCBS, AND HERBICIDES

(all results in ug/L)

U-3986.4

| | E & E Lab. No. 86- | Blank | 7348 | 7349 | 7350 | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 8/22/86 | 9010 | 9031 | 9073 | | | |
| Aldrin | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| a-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| b-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| g-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| d-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| Chlordane | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| 4,4'-DDD | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| 4,4'-DDE | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| 4,4'-DDT | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Dieldrin | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Endosulfan I | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| Endosulfan II | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Endosulfan sulfate | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Endrin | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Endrin aldehyde | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Heptachlor | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| Heptachlor epoxide | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| PCB - 1016 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1221 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1232 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1242 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1248 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 2,4-D | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| 2,4,5-TP (Silvex) | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| 2,4,5-T | | <0.05 | <0.05 | <0.05 | <0.05 | | | |

ecology and environment, inc.
International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-3986.5

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: U-3986 | | | RE: DF-2000 | | | |
| Sample Date: 8/20/86 | | | P.O. No.: | | | |
| Date Received: 8/21/86 | | | Sampled By: E & E, Inc. | | | |
| Sample Type: Water | | | Delivered By: Federal Express | | | |
| E & E Lab. No. 86- | 7348 | 7349 | 7350 | Blank | | |
| Customer No. | 9010 | 9031 | 9073 | | | |
| Sample Identity | | | | | | |
| | Results in: mg/L unless noted | | | | | |
| Total Dissolved Solids | 740 | 660 | 900 | NA | | |
| Oil and Grease | 0.4 | 0.8 | 2.3 | NA | | |
| Antimony | <0.15 | <0.15 | <0.15 | <0.15 | | |
| Beryllium | <0.01 | <0.01 | <0.01 | <0.01 | | |
| Cadmium | <0.005 | <0.005 | <0.005 | <0.005 | | |
| Chromium | <0.05 | <0.05 | <0.05 | <0.05 | | |
| Copper | <0.02 | <0.02 | 0.022 | <0.02 | | |
| Lead | 0.006 | 0.007 | 0.012 | <0.005 | | |
| Nickel | <0.1 | <0.1 | <0.1 | <0.1 | | |
| Silver | <0.04 | <0.04 | <0.04 | <0.04 | | |
| Thallium | <0.20 | <0.20 | <0.20 | <0.20 | | |
| Zinc | 0.248 | 0.071 | 0.374 | <0.05 | | |

NA: Not Applicable

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes," EPA-600/4-79-020, March 1983.

H-399

Supervising Analyst: Gary Hahn/KS

Date: October 9, 1986

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3986.8

| Compound | E & E Lab. No. 86- | 7348 | 7349 | 7350 | Method Blank | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9010 | 9031 | 9073 | | |
| bis(2-chloroethyl)ether | | <10 | <10 | <10 | <10 | |
| 1,3-dichlorobenzene | | <10 | <10 | <10 | <10 | |
| 1,4-dichlorobenzene | | <10 | <10 | <10 | <10 | |
| 1,2-dichlorobenzene | | <10 | <10 | <10 | <10 | |
| bis(2-chloroisopropyl)ether | | <10 | <10 | <10 | <10 | |
| N-nitrosodipropylamine | | <10 | <10 | <10 | <10 | |
| hexachloroethane | | <10 | <10 | <10 | <10 | |
| nitrobenzene | | <10 | <10 | <10 | <10 | |
| isophorone | | <10 | <10 | <10 | <10 | |
| bis(2-chloroethoxy)methane | | <10 | <10 | <10 | <10 | |
| 1,2,4-trichlorobenzene | | <10 | <10 | <10 | <10 | |
| naphthalene | | <10 | <10 | <10 | <10 | |
| hexachlorobutadiene | | <10 | <10 | <10 | <10 | |
| hexachlorocyclopentadiene | | <10 | <10 | <10 | <10 | |
| 2-chloronaphthalene | | <10 | <10 | <10 | <10 | |
| dimethyl phthalate | | <10 | <10 | <10 | <10 | |
| acenaphthylene | | <10 | <10 | <10 | <10 | |
| fluorene | | <10 | <10 | <10 | <10 | |
| acenaphthene | | <10 | <10 | <10 | <10 | |
| 2,4-dinitrotoluene | | <10 | <10 | <10 | <10 | |
| 2,6-dinitrotoluene | | <10 | <10 | <10 | <10 | |
| diethylphthalate | | <10 | <10 | 11 | <10 | |
| 4-chlorophenyl phenyl ether | | <10 | <10 | <10 | <10 | |
| N-nitrosodiphenylamine | | <10 | <10 | <10 | <10 | |
| 4-bromophenyl phenyl ether | | <10 | <10 | <10 | <10 | |
| hexachlorobenzene | | <10 | <10 | <10 | <10 | |
| phenanthrene | | <10 | <10 | <10 | <10 | |
| anthracene | | <10 | <10 | <10 | <10 | |
| di-n-butyl phthalate | | <10 | <10 | <10 | <10 | |
| fluoranthene | | <10 | <10 | <10 | <10 | |
| benzidine | | <50 | <50 | <50 | <50 | |
| pyrene | | <10 | <10 | <10 | <10 | |
| butyl benzyl phthalate | | 11 | <10 | <10 | <10 | |
| 3,3'-dichlorobenzidine | | <30 | <30 | <30 | <30 | |
| benzo(a)anthracene | | <10 | <10 | <10 | <10 | |
| bis(2-ethylhexyl)phthalate | | 57 | 160 | 80 | <10 | |
| chrysene | | <10 | <10 | <10 | <10 | |
| di-n-octyl phthalate | | <10 | <10 | <10 | <10 | |
| benzo(b)fluoranthene | | <10 | <10 | <10 | <10 | |
| benzo(k)fluoranthene | | <10 | <10 | <10 | <10 | |
| benzo(a)pyrene | | <10 | <10 | <10 | <10 | |
| indeno(1,2,3-cd)pyrene | | <10 | <10 | <10 | <10 | |
| dibenzo(a,h)anthracene | | <10 | <10 | <10 | <10 | |
| benzo(ghi)perylene | | <10 | <10 | <10 | <10 | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-3986.9

| Compound | E & E Lab. No. 86- | 7348 | 7349 | 7350 | Method Blank | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9010 | 9031 | 9073 | | |
| phenol | | <10 | <10 | <10 | <10 | |
| 2-chlorophenol | | <10 | <10 | <10 | <10 | |
| 2-nitrophenol | | <10 | <10 | <10 | <10 | |
| 2,4-dimethylphenol | | <10 | <10 | <10 | <10 | |
| 2,4-dichlorophenol | | <10 | <10 | <10 | <10 | |
| 4-chloro-3-methylphenol | | <10 | <10 | <10 | <10 | |
| 2,4,6-trichlorophenol | | <10 | <10 | <10 | <10 | |
| 2,4-dinitrophenol | | <30 | <30 | <30 | <30 | |
| 4-nitrophenol | | <10 | <10 | <10 | <10 | |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | <30 | <30 | |
| pentachlorophenol | | <30 | <30 | <30 | <30 | |

*Compound present below measurable detection limit

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-3986.10

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| nitrobenzene-D5 | 7348 | 100 | 77 | 77 |
| | 7349 | 100 | 69 | 69 |
| | 7350 | 100 | 77 | 77 |
| 2-fluorobiphenyl | 7348 | 100 | 76 | 76 |
| | 7349 | 100 | 73 | 73 |
| | 7350 | 100 | 92 | 92 |
| terphenyl-D14 | 7348 | 100 | 71 | 71 |
| | 7349 | 100 | 66 | 66 |
| | 7350 | 100 | 92 | 92 |
| phenol-D5 | 7348 | 200 | 58 | 29 |
| | 7349 | 200 | 50 | 25 |
| | 7350 | 200 | 68 | 34 |
| 2-fluorophenol | 7348 | 200 | 88 | 44 |
| | 7349 | 200 | 100 | 50 |
| | 7350 | 200 | 96 | 48 |
| 2,4,6-tribromophenol | 7348 | 200 | 90 | 45 |
| | 7349 | 200 | 82 | 41 |
| | 7350 | 200 | 131 | 65.5 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3986.11

| Compound | E & E Lab. No. 86-7348 | ug/L | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| bis(2-chloroethyl)ether | | <10 | <10 | -- |
| 1,3-dichlorobenzene | | <10 | <10 | -- |
| 1,4-dichlorobenzene | | <10 | <10 | -- |
| 1,2-dichlorobenzene | | <10 | <10 | -- |
| bis(2-chloroisopropyl)ether | | <10 | <10 | -- |
| N-nitrosodipropylamine | | <10 | <10 | -- |
| hexachloroethane | | <10 | <10 | -- |
| nitrobenzene | | <10 | <10 | -- |
| isophorone | | <10 | <10 | -- |
| bis(2-chloroethoxy)methane | | <10 | <10 | -- |
| 1,2,4-trichlorobenzene | | <10 | <10 | -- |
| naphthalene | | <10 | <10 | -- |
| hexachlorobutadiene | | <10 | <10 | -- |
| hexachlorocyclopentadiene | | <10 | <10 | -- |
| 2-chloronaphthalene | | <10 | <10 | -- |
| dimethyl phthalate | | <10 | <10 | -- |
| acenaphthylene | | <10 | <10 | -- |
| fluorene | | <10 | <10 | -- |
| acenaphthene | | <10 | <10 | -- |
| 2,4-dinitrotoluene | | <10 | <10 | -- |
| 2,6-dinitrotoluene | | <10 | <10 | -- |
| diethylphthalate | | <10 | <10 | -- |
| 4-chlorophenyl phenyl ether | | <10 | <10 | -- |
| N-nitrosodiphenylamine | | <10 | <10 | -- |
| 4-bromophenyl phenyl ether | | <10 | <10 | -- |
| hexachlorobenzene | | <10 | <10 | -- |
| phenanthrene | | <10 | <10 | -- |
| anthracene | | <10 | <10 | -- |
| di-n-butyl phthalate | | <10 | <10 | -- |
| fluoranthene | | <10 | <10 | -- |
| benzidine | | <50 | <50 | -- |
| pyrene | | <10 | <10 | -- |
| butyl benzyl phthalate | | 11 | 11 | 0 |
| 3,3'-dichlorobenzidine | | <30 | <30 | -- |
| benzo(a)anthracene | | <10 | <10 | -- |
| bis(2-ethylhexyl)phthalate | | 57 | 56 | 1.8 |
| chrysene | | <10 | <10 | -- |
| di-n-octyl phthalate | | <10 | <10 | -- |
| benzo(b)fluoranthene | | <10 | <10 | -- |
| benzo(k)fluoranthene | | <10 | <10 | -- |
| benzo(a)pyrene | | <10 | <10 | -- |
| indeno(1,2,3-c,d)pyrene | | <10 | <10 | -- |
| dibenzo(a,h)anthracene | | <10 | <10 | -- |
| benzo(g,h,i)perylene | | <10 | <10 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3986.12

| Compound | E & E Lab. No. 86-7348 | ug/L | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| phenol | | <10 | <10 | -- |
| 2-chlorophenol | | <10 | <10 | -- |
| 2-nitrophenol | | <10 | <10 | -- |
| 2,4-dimethylphenol | | <10 | <10 | -- |
| 2,4-dichlorophenol | | <10 | <10 | -- |
| 4-chloro-3-methylphenol | | <10 | <10 | -- |
| 2,4,6-trichlorophenol | | <10 | <10 | -- |
| 2,4-dinitrophenol | | <30 | <30 | -- |
| 4-nitrophenol | | <10 | <10 | -- |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | -- |
| pentachlorophenol | | <30 | <30 | -- |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-3986.13

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| 3986 | 7348 | 8/20 | 9/3 | 8/21 | 8/27 | 8/27 | 9/26 | 8/29 | 8/27 | 8/22 | 10/1 | 8/28 | 8/27 | 8/22 | 9/3 | 8/25 | 8/27 | 8/22 | 9/21 | 8/28 |
| | 7349 | 8/20 | 9/3 | 8/21 | 8/27 | 8/27 | 9/26 | 8/29 | 8/27 | 8/22 | 10/1 | 8/28 | 8/27 | 8/22 | 9/3 | 8/25 | 8/27 | 8/22 | 9/21 | 8/28 |
| | 7350 | 8/20 | 9/3 | 8/21,22 | 8/27 | 8/27 | 9/26 | 8/29 | 8/27 | 8/22 | 10/1 | 8/28 | 8/27 | 8/22 | 9/3 | 8/25 | 8/27 | 8/22 | 9/21 | 8/28 |

VOA CONFIRMATION DATE

| | |
|---|---|
| 7348 | 8/21,28 |
| 7349 | 8/21 |
| 7350 | 8/21,28 |

PHENOL CONFIRMATION DATE

| | |
|---|---|
| 7350 | 9/15 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-3986.14

| Compound | E & E Lab. No. 86- | Blank | 7348 | 7349 | 7350* | |
|---|---|---|---|---|---|---|
| | Sample Identity | 8/22/86 | 9010 | 9031 | 9073 | |
| phenol | | <2.0 | <2.0 | <2.0 | <2.0 | |
| 2-chlorophenol | | <2.0 | <2.0 | <2.0 | <2.0 | |
| 2-nitrophenol | | <2.0 | <2.0 | <2.0 | <2.0 | |
| 2,4-dimethylphenol | | <2.0 | <2.0 | <2.0 | <2.0 | |
| 2,4-dichlorophenol | | <2.0 | <2.0 | <2.0 | <2.0 | |
| 4-chloro-3-methylphenol | | <2.0 | <2.0 | <2.0 | <2.0 | |
| 2,4,6-trichlorophenol | | <2.0 | <2.0 | <2.0 | <2.0 | |
| 2,4-dinitrophenol | | <13.0 | <13.0 | <13.0 | <13.0 | |
| 4-nitrophenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 4,6-dinitro-2-methylphenol | | <16.0 | <16.0 | <16.0 | <16.0 | |
| pentachlorophenol | | <7.4 | <7.4 | <7.4 | <7.4 | |

*Sample confirmed - results negative.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3986.15

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| phenol | Blank Spike | <2.0 | 40 | 17.7 | 44.3 |
| 2-chlorophenol | Blank Spike | <2.0 | 40 | 39.7 | 99.2 |
| 2-nitrophenol | Blank Spike | <2.0 | 40 | 38.3 | 95.7 |
| 2,4-dimethylphenol | Blank Spike | <2.0 | 40 | 40.8 | 102 |
| 2,4-dichlorophenol | Blank Spike | <2.0 | 40 | 42.0 | 105 |
| 4-chloro-3-methylphenol | Blank Spike | <2.0 | 40 | 44.8 | 112 |
| 2,4,6-trichlorophenol | Blank Spike | <2.0 | 40 | 43.6 | 109 |
| 2,4-dinitrophenol | Blank Spike | <13.0 | 40 | 48.8 | 122 |
| 4-nitrophenol | Blank Spike | <5.0 | 40 | 17.5 | 43.8 |
| 4,6-dinitro-2-methylphenol | Blank Spike | <16.0 | 40 | 44.4 | 111 |
| pentachlorophenol | Blank Spike | <7.4 | 40 | 46.0 | 115 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-3986.16

| Parameter | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (mg/L) | | | |
| Oil and Grease | D.I. Spike | <0.2 | 7.4 | 10.3 | 139 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-3986.17

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Cadmium | 7298* | <0.005 | <0.005 | -- |
| Chromium | 7298* | <0.05 | <0.05 | -- |
| Copper | 7298* | 0.023 | 0.022 | 4.4 |
| Lead | 7298* | 0.019 | 0.020 | 5.1 |
| Nickel | 7298* | <0.1 | <0.1 | -- |
| Zinc | 7298* | 0.209 | 0.219 | 4.7 |
| Total Dissolved Solids | 7349 | 660 | 680 | 3.0 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-3986.18

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Antimony | 990 | 1112 | 12.3 |
| Beryllium | 960 | 1006 | 4.8 |
| Cadmium | 940 | 963 | 2.4 |
| Chromium | 1030 | 1056 | 2.5 |
| Copper | 1030 | 1042 | 1.2 |
| Lead | 53.0 | 50.0 | 5.7 |
| Nickel | 1020 | 1040 | 2.0 |
| Silver | 6000 | 6152 | 2.5 |
| Thallium | 25.0 | 25.2 | 0.8 |
| Zinc | 1010 | 1024 | 1.4 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-4184

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 8329 | 9011 | 0165-PG-001-GP-86-9011 |
| 8330 | 9032 | 0165-PG-002-GP-86-9032 |
| 8331 | 9074 | 0165-PG-004-GP-86-9074 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-4184.1

| Job | Sample Number | Sample Date | PAH (7/S + 30) Extraction Dead | PAH (7/S + 30) Extraction Extr | PAH (7/S + 30) Analysis Dead | PAH (7/S + 30) Analysis Anal | BNA(7/E + 40) Extraction Dead | BNA(7/E + 40) Extraction Extr | BNA(7/E + 40) Analysis Dead | BNA(7/E + 40) Analysis Anal | TDS (7) Dead | TDS (7) Anal | O&G(28) Dead | O&G(28) Anal | Pet. HC(28) Dead | Pet. HC(28) Anal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-4184 | 8329 | 9/25 | -- | -- | -- | -- | 10/2 | 9/29 | 11/8 | 10/2 | 10/2 | 9/29 | 10/23 | 9/30 | -- | -- |
| | 8330 | 9/25 | -- | -- | -- | -- | 10/2 | 9/29 | 11/8 | 10/2 | 10/2 | 9/29 | 10/23 | 9/30 | -- | -- |
| | 8331 | 9/25 | -- | -- | -- | -- | 10/2 | 9/29 | 11/8 | 10/2 | 10/2 | 9/29 | 10/23 | 9/30 | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-4184.2

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E-30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| U-4184 | 8329 | 9/25 | 10/9 | 9/29 | 10/2 | 9/30 | 10/30 | 10/2 | 10/2 | 9/30 | 11/9 | 10/1 | 10/2 | 9/30 | 10/9 | 10/2 | 10/2 | 10/1 | 10/31 | 10/3 |
| | 8330 | 9/25 | 10/9 | 9/29 | 10/2 | 9/30 | 10/30 | 10/2 | 10/2 | 9/30 | 11/9 | 10/1 | 10/2 | 9/30 | 10/9 | 10/2 | 10/2 | 10/1 | 10/31 | 10/3 |
| | 8331 | 9/25 | 10/9 | 9/29 | 10/2 | 9/30 | 10/30 | 10/2 | 10/2 | 9/30 | 11/9 | 10/1 | 10/2 | 9/30 | 10/9 | 10/2 | 10/2 | 10/1 | 10/31 | 10/3 |

VOA
CONFIRMATION
DATE

| | |
|---|---|
| 8329 | 10/1 |
| 8330 | 10/1 |
| 8331 | 10/1 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

ECOLOGY AND ENVIRONMENTS, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L)

U-4184.3

| Compound | E & E Lab. No. 86- | Blank | 8529 | 8530* | 8531* | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9/29/86 | 9011 | 9032 | 9074 | |
| chlorobenzene | | <0.20 | <0.20 | <0.20 | <0.20 | |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | <0.40 | <0.40 | |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | <0.40 | <0.40 | |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | <0.30 | <0.30 | |
| benzene | | <0.20 | <0.20 | <0.20 | <0.20 | |
| total xylenes | | <1.0 | <1.0 | <1.0 | <1.0 | |
| toluene | | <0.20 | <0.20 | 0.47 | 0.88 | |
| ethylbenzene | | <0.20 | <0.20 | <0.20 | <0.20 | |

*Sample confirmed - results positive.

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/L)

U-4184.4

| Compound | E & E Lab. No. 86- | Blank | Blank | 8329* | 8330* | 8331* | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9/29/86 | 9/30/86 | 9011 | 9032 | 9074 | |
| carbon tetrachloride | | <0.12 | <0.12 | <0.12 | <0.12 | <1.2 | |
| 1,2-dichloroethane | | <0.03 | <0.03 | <0.03 | <0.03 | <0.30 | |
| 1,1,1-trichloroethane | | <0.03 | <0.03 | 1.9 | <0.03 | <0.30 | |
| 1,1-dichloroethane | | <0.07 | <0.07 | 0.18 | 0.15 | <0.70 | |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | <0.02 | <0.02 | <0.20 | |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | <0.03 | <0.03 | <0.30 | |
| chloroethane | | <0.52 | <0.52 | <0.52 | <0.52 | <5.2 | |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | <0.13 | <0.13 | <1.3 | |
| chloroform | | 0.08 | <0.05 | <0.05 | <0.05 | <0.50 | |
| 1,1-dichloroethene | | <0.13 | <0.13 | <0.13 | <0.13 | <1.3 | |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | <0.10 | <0.10 | <1.0 | |
| 1,2-dichloropropane | | <0.04 | <0.04 | <0.04 | <0.04 | <0.40 | |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | <0.34 | <0.34 | <3.4 | |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | <0.20 | <0.20 | <2.0 | |
| methylene chloride | | <0.25 | <0.25 | 2.6 | <0.25 | <2.5 | |
| chloromethane | | <0.08 | <0.08 | <0.08 | <0.08 | <0.80 | |
| bromomethane | | <1.18 | <1.18 | <1.18 | <1.18 | <12 | |
| bromoform | | <0.20 | <0.20 | <0.20 | <0.20 | <2.0 | |
| bromodichloromethane | | <0.10 | <0.10 | <0.10 | <0.10 | <1.0 | |
| fluorotrichloromethane | | <2.0 | <2.0 | <2.0 | <2.0 | <20 | |
| dichlorodifluoromethane | | <1.81 | <1.81 | <1.81 | <1.81 | <18 | |
| chlorodibromomethane | | <0.09 | <0.09 | <0.09 | <0.09 | <0.90 | |
| tetrachloroethene | | <0.03 | <0.03 | <0.03 | <0.03 | <0.36 | |
| trichloroethene | | <0.12 | 0.32 | 0.22 | <0.12 | 24 | |
| vinyl chloride | | <0.18 | <0.18 | <0.18 | <0.18 | <1.8 | |

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation, all samples have been blank subtracted. The actual value of the blank has been reported.

*: Sample confirmed - results positive.



recycled paper

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-4184.8

| Compound | E & E Lab. No. 86- | 8329 | 8330 | 8331 | Method Blank | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9011 | 9032 | 9074 | | |
| phenol | | <10 | <10 | <10 | <10 | |
| 2-chlorophenol | | <10 | <10 | <10 | <10 | |
| 2-nitrophenol | | <10 | <10 | <10 | <10 | |
| 2,4-dimethylphenol | | <10 | <10 | <10 | <10 | |
| 2,4-dichlorophenol | | <10 | <10 | <10 | <10 | |
| 4-chloro-3-methylphenol | | <10 | <10 | <10 | <10 | |
| 2,4,6-trichlorophenol | | <10 | <10 | <10 | <10 | |
| 2,4-dinitrophenol | | <30 | <30 | <30 | <30 | |
| 4-nitrophenol | | <10 | <10 | <10 | <10 | |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | <30 | <30 | |
| pentachlorophenol | | <30 | <30 | <30 | <30 | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-4184.9

| Compound | E & E Lab. No. 86- | 8329 | 8330 | 8331 | Method Blank | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9011 | 9032 | 9074 | | |
| bis(2-chloroethyl)ether | | <10 | <10 | <10 | <10 | |
| 1,3-dichlorobenzene | | <10 | <10 | <10 | <10 | |
| 1,4-dichlorobenzene | | <10 | <10 | <10 | <10 | |
| 1,2-dichlorobenzene | | <10 | <10 | <10 | <10 | |
| bis(2-chloroisopropyl)ether | | <10 | <10 | <10 | <10 | |
| N-nitrosodipropylamine | | <10 | <10 | <10 | <10 | |
| hexachloroethane | | <10 | <10 | <10 | <10 | |
| nitrobenzene | | <10 | <10 | <10 | <10 | |
| isophorone | | <10 | <10 | <10 | <10 | |
| bis(2-chloroethoxy)methane | | <10 | <10 | <10 | <10 | |
| 1,2,4-trichlorobenzene | | <10 | <10 | <10 | <10 | |
| naphthalene | | <10 | <10 | <10 | <10 | |
| hexachlorobutadiene | | <10 | <10 | <10 | <10 | |
| hexachlorocyclopentadiene | | <10 | <10 | <10 | <10 | |
| 2-chloronaphthalene | | <10 | <10 | <10 | <10 | |
| dimethyl phthalate | | <10 | <10 | <10 | <10 | |
| acenaphthylene | | <10 | <10 | <10 | <10 | |
| fluorene | | <10 | <10 | <10 | <10 | |
| acenaphthene | | <10 | <10 | <10 | <10 | |
| 2,4-dinitrotoluene | | <10 | <10 | <10 | <10 | |
| 2,6-dinitrotoluene | | <10 | <10 | <10 | <10 | |
| diethylphthalate | | <10 | <10 | <10 | <10 | |
| 4-chlorophenyl phenyl ether | | <10 | <10 | <10 | <10 | |
| N-nitrosodiphenylamine | | <10 | <10 | <10 | <10 | |
| 4-bromophenyl phenyl ether | | <10 | <10 | <10 | <10 | |
| hexachlorobenzene | | <10 | <10 | <10 | <10 | |
| phenanthrene | | <10 | <10 | <10 | <10 | |
| anthracene | | <10 | <10 | <10 | <10 | |
| di-n-butyl phthalate | | 26 | 36 | 17 | 22 | |
| fluoranthene | | <10 | <10 | <10 | <10 | |
| benzidine | | <50 | <50 | <50 | <50 | |
| pyrene | | <10 | <10 | <10 | <10 | |
| butyl benzyl phthalate | | <10 | <10 | <10 | <10 | |
| 3,3'-dichlorobenzidine | | <30 | <30 | <30 | <30 | |
| benzo(a)anthracene | | <10 | <10 | <10 | <10 | |
| bis(2-ethylhexyl)phthalate | | 25 | 93 | <10* | <10 | |
| chrysene | | <10 | <10 | <10 | <10 | |
| di-n-octyl phthalate | | <10 | <10 | <10 | <10 | |
| benzo(b)fluoranthene | | <10 | <10 | <10 | <10 | |
| benzo(k)fluoranthene | | <10 | <10 | <10 | <10 | |
| benzo(a)pyrene | | <10 | <10 | <10 | <10 | |
| indeno(1,2,3-cd)pyrene | | <10 | <10 | <10 | <10 | |
| dibenzo(a,h)anthracene | | <10 | <10 | <10 | <10 | |
| benzo(ghi)perylene | | <10 | <10 | <10 | <10 | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENTS, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PRIORITY POLLUTANT PESTICIDES, PCBs AND HERBICIDE BY GC
(all results in ug/L)

U-4184.5

| | E & E Lab. No. 86- | Blank | 8329 | 8330 | 8331 | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9/30/86 | 9011 | 9032 | 9074 | | | |
| Aldrin | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| a-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| b-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| g-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| d-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| Chlordane | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| 4,4'-DDD | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| 4,4'-DDE | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| 4,4'-DDT | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Dieldrin | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Endosulfan I | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| Endosulfan II | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Endosulfan sulfate | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Endrin | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Endrin aldehyde | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Heptachlor | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| Heptachlor epoxide | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| PCB - 1016 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1221 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1232 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1242 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1248 | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | | | |
| 2,4-D | | <0.50 | <0.50 | <0.50 | <0.50 | | | |
| 2,4,5-TP (Silvex) | | <0.05 | <0.05 | <0.05 | <0.05 | | | |
| 2,4,5-T | | <0.05 | <0.05 | <0.05 | <0.05 | | | |

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-4184.6

| Compound | E & E Lab. No. 86- | Blank | 8329 | 8330 | 8331 | |
|---|---|---|---|---|---|---|
| | Sample Identity | 10/1/86 | 9011 | 9032 | 9074 | |
| phenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 2-chlorophenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 2-nitrophenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 2,4-dimethylphenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 2,4-dichlorophenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 4-chloro-3-methylphenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 2,4,6-trichlorophenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 2,4-dinitrophenol | | <13 | <13 | <13 | <13 | |
| 4-nitrophenol | | <5.0 | <5.0 | <5.0 | <5.0 | |
| 4,6-dinitro-2-methylphenol | | <16 | <16 | <16 | <16 | |
| pentachlorophenol | | <7.4 | <7.4 | <7.4 | <7.4 | |

ECOLOGY AND ENVIRONMENTS, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/L)

U-4184.7

| | E & E Lab. No. 86- | 8329 | 8330 | 8331 | Blank | | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9011 | 9032 | 9074 | 9/30/86 | | | |
| Naled | | <0.10 | <0.10 | <0.10 | <0.10 | | | |
| Phorate | | <0.15 | <0.15 | <0.15 | <0.15 | | | |
| Disulfoton | | <0.20 | <0.20 | <0.20 | <0.20 | | | |
| Chlorpyrifos | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Dimethoate | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Malathion | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Mevinphos | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Parathion | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Methyl parathion | | <0.30 | <0.30 | <0.30 | <0.30 | | | |
| Diazinon | | <0.60 | <0.60 | <0.60 | <0.60 | | | |
| Methyl azinphos | | <1.5 | <1.5 | <1.5 | <1.5 | | | |

ecology and environment, inc.
International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-4184.10

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: | U-4184 | | RE: | DF-2000 | | |
| Sample Date: | 9/25/86 | | P.O. No.: | | | |
| Date Received: | 9/26/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Water | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 8329 | 8330 | 8331 | Blank | | |
| Customer No. | 9011 | 9032 | 9074 | | | |
| Sample Identity | | | | | | |
| | Results in mg/L | | | | | |
| Total Dissolved Solids | 270 | 700 | 1300 | NA | | |
| Oil and Grease | 0.' | 0.6 | 1.6 | NA | | |
| Antimony | <0.15 | <0.15 | <0.15 | <0.15 | | |
| Beryllium | <0.01 | <0.01 | <0.01 | <0.01 | | |
| Cadmium | <0.01 | <0.01 | <0.01 | <0.01 | | |
| Chromium | <0.05 | <0.05 | <0.05 | <0.05 | | |
| Copper | <0.02 | <0.02 | <0.02 | <0.02 | | |
| Lead | 0.007 | <0.005 | 0.008 | <0.005 | | |
| Nickel | <0.1 | <0.1 | <0.1 | <0.1 | | |
| Silver | <0.04 | <0.04 | <0.04 | <0.04 | | |
| Thallium | <0.20 | <0.20 | <0.20 | <0.20 | | |
| Zinc | <0.05 | <0.05 | 0.548 | <0.05 | | |

NA: Not applicable.

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.

H-421

Supervising Analyst: _____

Date: _____

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-4184.13

| Compound | E & E Laboratory No. 86-8329 | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 1,2-dichlorobenzene | | <0.40 | 10.0 | 9.4 | 94 |
| 1,3-dichlorobenzene | | <0.40 | 10.0 | 9.4 | 94 |
| 1,4-dichlorobenzene | | <0.30 | 10.0 | 9.3 | 93 |
| benzene | | <0.20 | 10.0 | 8.0 | 80 |
| toluene | | <0.20 | 10.0 | 9.3 | 93 |
| ethyl benzene | | <0.20 | 10.0 | 9.3 | 93 |

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

U-4184.12

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| Phenol-D5 | 8329 | 200 | 62 | 31 |
| | 8330 | 200 | 54 | 27 |
| | 8331 | 200 | 43 | 22 |
| 2-Fluorophenol | 8329 | 200 | 135 | 68 |
| | 8330 | 200 | 120 | 60 |
| | 8331 | 200 | 105 | 53 |
| 2,4,6-Tribromophenol | 8329 | 200 | 110 | 55 |
| | 8330 | 200 | 104 | 52 |
| | 8331 | 200 | 108 | 54 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

U-4184.11

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| Nitrobenzene-D5 | 8329 | 100 | 54 | 54 |
| | 8330 | 100 | 72 | 72 |
| | 8331 | 100 | 72 | 72 |
| 2-Fluorobiphenyl | 8329 | 100 | 56 | 56 |
| | 8330 | 100 | 71 | 71 |
| | 8331 | 100 | 70 | 70 |
| Terphenyl-D14 | 8329 | 100 | 61 | 61 |
| | 8330 | 100 | 73 | 73 |
| | 8331 | 100 | 73 | 73 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-4184.14

| Parameter | E & E Laboratory No. 86- DI Spike | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 2,4-D | | <0.50 | 10.0 | 8.8 | 88 |
| Silvex (2,4,5-TP) | | <0.05 | 10.0 | 7.6 | 76 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-4184.15

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Total Dissolved Solids | 8328* | 320 | 310 | 3.2 |
| Antimony | 8331 | <0.15 | <0.15 | -- |
| Beryllium | 8331 | <0.01 | <0.01 | -- |
| Cadmium | 8331 | <0.01 | <0.01 | -- |
| Chromium | 8331 | <0.05 | <0.05 | -- |
| Copper | 8331 | <0.02 | <0.02 | -- |
| Lead | 8331 | 0.008 | 0.008 | 0 |
| Nickel | 8331 | <0.1 | <0.1 | -- |
| Silver | 8331 | <0.04 | <0.04 | -- |
| Thallium | 8331 | <0.20 | <0.20 | -- |
| Zinc | 8331 | 0.548 | 0.540 | 1.5 |

*This represents 10% QC. This is not one of your samples but was analyzed in the same batch as your samples.

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-4184.16

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Antimony | 990 | 1112 | 12.3 |
| Beryllium | 960 | 1006 | 4.8 |
| Cadmium | 940 | 999 | 6.3 |
| Chromium | 1030 | 1024 | 0.6 |
| Copper | 1030 | 1030 | 0 |
| Lead | 17.0 | 17.3 | 1.8 |
| Nickel | 1020 | 1009 | 1.1 |
| Silver | 6000 | 6152 | 2.5 |
| Thallium | 25.0 | 25.2 | 0.8 |
| Zinc | 1010 | 1061 | 5.0 |
| Oil and Grease | 13,200 | 16,400 | 24.2 |

SAMPLE IDENTIFICATION
CROSS-REFERENCE

U-4195

| Laboratory Number 86- | Field Number | Field Location |
|---|---|---|
| 8364 | 9008 | 0165-NP-001-GN-86-9008 |
| 8365 | 9009 | 0165-NP-001-GN-86-9009 |
| 8366 | 9044 | 0165-NP-002-GN-86-9044 |
| 8367 | 9045 | 0165-NP-002-GN-86-9045 |
| 8368 | 9200 | 0165-PG-000-GP-86-9200 |
| 8369 | 9140 | 0165-PG-005-GP-86-9140 |
| 8385 | 9140 | 0165-PG-005-GP-86-9140 |
| | | |
| | | |
| | | |
| | | |
| | | |

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-4195.1

| Job | Sample Number | Sample Date | VOA(14) | | Herb(7/E+30) | | | | Pest/PCB(7/E+40) | | | | Organophos(7/S+14) | | | | Phenols(7/E+30) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | | Extraction | | Analysis | |
| | | | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal | Dead | Extr | Dead | Anal |
| U-4195 | 8364 | 9/26 | 10/10 | 9/29,10/1 | 10/3 | 9/30 | 10/30 | 10/2 | 10/3 | 9/30 | 11/9 | 10/1 | 10/3 | 9/30 | 10/10 | 10/2 | 10/3 | 10/1 | 10/3 | 10/6 |
| | 8365 | 9/26 | 10/10 | 9/29,10/1 | 10/3 | 9/30 | 10/30 | 10/2 | 10/3 | 9/30 | 11/9 | 10/1 | 10/3 | 9/30 | 10/10 | 10/2 | 10/3 | 10/1 | 10/3 | 10/6 |
| | 8366 | 9/26 | 10/10 | 9/29,9/30 | 10/3 | 9/30 | 10/30 | 10/2 | 10/3 | 9/30 | 11/9 | 10/1 | 10/3 | 9/30 | 10/10 | 10/3 | 10/3 | 10/1 | 10/3 | 10/6 |
| | 8367 | 9/26 | 10/10 | 9/29,10/1 | 10/3 | 9/30 | 10/30 | 10/2 | 10/3 | 9/30 | 11/9 | 10/2 | 10/3 | 9/30 | 10/10 | 10/3 | 10/3 | 10/1 | 10/3 | 10/6 |
| | 8368 | 9/26 | 10/10 | 9/29,9/30 | 10/3 | 9/30 | 10/30 | 10/2 | 10/3 | 9/30 | 11/9 | 10/2 | 10/3 | 9/30 | 10/10 | 10/3 | 10/3 | 10/1 | 10/3 | 10/6 |
| | 8369 | 9/26 | 10/10 | 9/29,9/30 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10/3 | 10/1 | 10/3 | 10/6 |

H-429

| | VOA Confirmation Date |
|---|---|
| 8364 | 10/1 |
| 8365 | 10/1 |
| 8367 | 10/1 |
| 8368 | 10/1 |
| 8369 | 10/1 |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time expires.
S+#: Holding time based on sample date.
E+#: Holding time based on sample extraction.

SAMPLE TRACKING OF
ANALYSES REQUIRING HOLDING TIMES

U-4195.2

| Job | Sample Number | Sample Date | PAH (7/S + 30) Extraction Dead | PAH (7/S + 30) Extraction Extr | PAH (7/S + 30) Analysis Dead | PAH (7/S + 30) Analysis Anal | BNA(7/E + 40) Extraction Dead | BNA(7/E + 40) Extraction Extr | BNA(7/E + 40) Analysis Dead | BNA(7/E + 40) Analysis Anal | TDS (7) Dead | TDS (7) Anal | O&G(28) Dead | O&G(28) Anal | Pet. HC(28) Dead | Pet. HC(28) Anal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-4195 | 8364 | 9/26 | -- | -- | -- | -- | 10/3 | 10/2 | 11/11 | 10/9 | 10/3 | 10/1 | 10/24 | 9/30 | -- | -- |
| | 8365 | 9/26 | -- | -- | -- | -- | 10/3 | 10/2 | 11/11 | 10/8 | 10/3 | 10/1 | 10/24 | 9/30 | -- | -- |
| | 8366 | 9/26 | -- | -- | -- | -- | 10/3 | 10/2 | 11/11 | 10/8 | 10/3 | 10/1 | 10/24 | 9/30 | -- | -- |
| | 8367 | 9/26 | -- | -- | -- | -- | 10/3 | 10/2 | 11/11 | 10/8 | 10/3 | 10/1 | 10/24 | 9/30 | -- | -- |
| | 8368 | 9/26 | -- | -- | -- | -- | 10/3 | 10/2 | 11/11 | 10/8 | 10/3 | 10/1 | 10/24 | 9/30 | -- | -- |
| | 8369 | 9/26 | -- | -- | -- | -- | 10/3 | 10/2 | 11/11 | 10/8 | -- | -- | 10/24 | 9/30 | -- | -- |
| | 8385 | 9/30 | -- | -- | -- | -- | -- | -- | -- | -- | 10/7 | 10/1 | -- | -- | -- | -- |

DEAD: Date sample holding time expires.
EXTR: Date sample was extracted.
ANAL: Date sample was analyzed.
( ): Holding time.
S+#: Holding time expiration based on sample date.
E+#: Holding time expiration based on extraction date.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L)

U-4195.3

| Compound | E & E Lab. No. 86- | Blank | 8364 | 8365 | 8366 | 8367 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9/29/86 | 9008 | 9009 | 9044 | 9045 |
| chlorobenzene | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 |
| benzene | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| total xylenes | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| toluene | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| ethylbenzene | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
PURGEABLE AROMATIC COMPOUNDS BY GC

(all results in ug/L)

U-4195.4

| Compound | E & E Lab. No. 86- | 8368* | 8369* | Blank | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9200 | 9140 | 9/30/86 | | |
| chlorobenzene | | 1.5 | <0.20 | <0.20 | | |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | <0.40 | | |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | <0.40 | | |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | <0.30 | | |
| benzene | | <0.20 | <0.20 | <0.20 | | |
| total xylenes | | <1.0 | <1.0 | <1.0 | | |
| toluene | | 0.34 | 1.2 | <0.20 | | |
| ethylbenzene | | <0.20 | <0.20 | <0.20 | | |

*Sample confirmed - results positive.

ECOLOGY AND ENVIRONMENT'S, INC.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/L)

U-4195.28

| Compound | E & E Lab. No. 86- | Blank | Blank | 8364* | 8365* | 8366 | 8367* |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9/30/86 | 10/1/86 | 9008 | 9009 | 9044 | 9045 |
| carbon tetrachloride | | <0.12 | <0.12 | <0.60 | <0.60 | <0.12 | <0.24 |
| 1,2-dichloroethane | | <0.03 | <0.03 | <0.15 | <0.15 | <0.03 | <0.06 |
| 1,1,1-trichloroethane | | <0.03 | <0.03 | 7.1 | 3.9 | <0.03 | 1.6 |
| 1,1-dichloroethane | | <0.07 | <0.07 | <0.35 | <0.35 | <0.07 | <0.14 |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | <0.10 | <0.10 | <0.02 | <0.04 |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | <0.15 | <0.15 | <0.03 | <0.06 |
| chloroethane | | <0.52 | <0.52 | <2.6 | <2.6 | <0.52 | <1.0 |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | <0.65 | <0.65 | <0.13 | <0.26 |
| chloroform | | <0.05 | <0.05 | <0.25 | <0.25 | <0.05 | <0.10 |
| 1,1-dichloroethene | | <0.13 | <0.13 | <0.65 | <0.65 | <0.13 | <0.26 |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | <0.50 | <0.50 | <0.10 | <0.20 |
| 1,2-dichloropropane | | <0.04 | <0.04 | <0.20 | <0.20 | <0.04 | <0.08 |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | <1.7 | <1.7 | <0.34 | <0.68 |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | <1.0 | <1.0 | <0.20 | <0.40 |
| methylene chloride | | <0.25 | <0.25 | 110 | 98 | <0.25 | 27 |
| chloromethane | | <0.08 | <0.08 | <0.40 | <0.40 | <0.08 | <0.16 |
| bromomethane | | <1.18 | <1.18 | <5.9 | <5.9 | <1.18 | <2.4 |
| bromoform | | <0.20 | <0.20 | <1.0 | <1.0 | <0.20 | <0.40 |
| bromodichloromethane | | <0.10 | <0.10 | <0.50 | <0.50 | <0.10 | <0.20 |
| fluorotrichloromethane | | <2.0 | <2.0 | <10 | <10 | <2.0 | <4.0 |
| dichlorodifluoromethane | | <1.81 | <1.81 | <9.0 | <9.0 | <1.81 | <3.6 |
| chlorodibromomethane | | <0.09 | <0.09 | <0.45 | <0.45 | <0.09 | <0.18 |
| tetrachloroethene | | <0.03 | <0.03 | 2.6 | 1.7 | <0.03 | 0.98 |
| trichloroethene | | 0.56 | <0.12 | <0.60 | <0.60 | <0.12 | <0.24 |
| vinyl chloride | | <0.18 | <0.18 | <0.90 | <0.90 | <0.18 | <0.36 |

*Sample confirmed - results psoitive.

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR
PURGEABLE HALOCARBON COMPOUNDS BY GC
(all results in ug/L)

U-4195.6

| Compound | E & E Lab. No. 86- | 8368* | 8369+ | | | | |
|---|---|---|---|---|---|---|---|
| | Sample Identity | 9200 | 9140 | | | | |
| carbon tetrachloride | | <0.12 | <0.12 | | | | |
| 1,2-dichloroethane | | <0.03 | <0.03 | | | | |
| 1,1,1-trichloroethane | | <0.03 | <0.03 | | | | |
| 1,1-dichloroethane | | <0.07 | <0.07 | | | | |
| 1,1,2-trichloroethane | | <0.02 | <0.02 | | | | |
| 1,1,2,2-tetrachloroethane | | <0.03 | <0.03 | | | | |
| chloroethane | | <0.52 | <0.52 | | | | |
| 2-chloroethylvinyl ether | | <0.13 | <0.13 | | | | |
| chloroform | | 2.6 | <0.05 | | | | |
| 1,1-dichloroethene | | <0.13 | <0.13 | | | | |
| trans-1,2-dichloroethene | | <0.10 | <0.10 | | | | |
| 1,2-dichloropropane | | <0.04 | <0.04 | | | | |
| trans-1,3-dichloropropene | | <0.34 | <0.34 | | | | |
| cis-1,3-dichloropropene | | <0.20 | <0.20 | | | | |
| methylene chloride | | <0.25 | <0.25 | | | | |
| chloromethane | | <0.08 | <0.08 | | | | |
| bromomethane | | <1.18 | <1.18 | | | | |
| bromoform | | <0.20 | <0.20 | | | | |
| bromodichloromethane | | <0.10 | <0.10 | | | | |
| fluorotrichloromethane | | <2.0 | <2.0 | | | | |
| dichlorodifluoromethane | | <1.81 | <1.81 | | | | |
| chlorodibromomethane | | <0.09 | <0.09 | | | | |
| tetrachloroethene | | <0.03 | <0.03 | | | | |
| trichloroethene | | <0.12 | <0.12 | | | | |
| vinyl chloride | | <0.18 | <0.18 | | | | |

*Sample confirmed - results positive.
+Sample confirmed - results negative.

NOTE: Due to low level artifacts present in the methanol used for internal standard preparation, all samples have been blank subtracted. The actual value of the blank has been reported.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-4195.7

| Compound | E & E Lab. No. 86- | 8364 | 8365 | 8366 | 8367 | 8368 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9008 | 9009 | 9044 | 9045 | 9200 |
| phenol | | <10 | <10 | <10 | <10 | <10 |
| 2-chlorophenol | | <10 | <10 | <10 | <10 | <10 |
| 2-nitrophenol | | <10 | <10 | <10 | <10 | <10 |
| 2,4-dimethylphenol | | <10 | <10 | <10 | <10 | <10 |
| 2,4-dichlorophenol | | <10 | <10 | <10 | <10 | <10 |
| 4-chloro-3-methylphenol | | <10 | <10 | <10 | <10 | <10 |
| 2,4,6-trichlorophenol | | <10 | <10 | <10 | <10 | <10 |
| 2,4-dinitrophenol | | <30 | <30 | <30 | <30 | <30 |
| 4-nitrophenol | | <10 | <10 | <10 | <10 | <10 |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | <30 | <30 | <30 |
| pentachlorophenol | | <30 | <30 | <30 | <30 | <30 |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
ACID EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-4195.8

| Compound | E & E Lab. No. 86- | 8369 | Method Blank | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9140 | | | | |
| phenol | | <10 | <10 | | | |
| 2-chlorophenol | | <10 | <10 | | | |
| 2-nitrophenol | | <10 | <10 | | | |
| 2,4-dimethylphenol | | <10 | <10 | | | |
| 2,4-dichlorophenol | | <10 | <10 | | | |
| 4-chloro-3-methylphenol | | <10 | <10 | | | |
| 2,4,6-trichlorophenol | | <10 | <10 | | | |
| 2,4-dinitrophenol | | <30 | <30 | | | |
| 4-nitrophenol | | <10 | <10 | | | |
| 4,6-dinitro-2-methylphenol | | <30 | <30 | | | |
| pentachlorophenol | | <30 | <30 | | | |

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-4195.9

| Compound | E & E Lab. No. 86- | 8364 | 8365 | 8366 | 8367 | 8368 |
|---|---|---|---|---|---|---|
| | Sample Identity | 9008 | 9009 | 9044 | 9045 | 9200 |
| bis(2-chloroethyl)ether | | <10 | <10 | <10 | <10 | <10 |
| 1,3-dichlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| 1,4-dichlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| 1,2-dichlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| bis(2-chloroisopropyl)ether | | <10 | <10 | <10 | <10 | <10 |
| N-nitrosodipropylamine | | <10 | <10 | <10 | <10 | <10 |
| hexachloroethane | | <10 | <10 | <10 | <10 | <10 |
| nitrobenzene | | <10 | <10 | <10 | <10 | <10 |
| isophorone | | <10 | <10 | <10 | <10 | <10 |
| bis(2-chloroethoxy)methane | | <10 | <10 | <10 | <10 | <10 |
| 1,2,4-trichlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| naphthalene | | <10 | <10 | <10 | <10 | <10 |
| hexachlorobutadiene | | <10 | <10 | <10 | <10 | <10 |
| hexachlorocyclopentadiene | | <10 | <10 | <10 | <10 | <10 |
| 2-chloronaphthalene | | <10 | <10 | <10 | <10 | <10 |
| dimethyl phthalate | | <10 | <10 | <10 | <10 | <10 |
| acenaphthylene | | <10 | <10 | <10 | <10 | <10 |
| fluorene | | <10 | <10 | <10 | <10 | <10 |
| acenaphthene | | <10 | <10 | <10 | <10 | <10 |
| 2,4-dinitrotoluene | | <10 | <10 | <10 | <10 | <10 |
| 2,6-dinitrotoluene | | <10 | <10 | <10 | <10 | <10 |
| diethylphthalate | | <10 | <10 | <10 | <10 | <10 |
| 4-chlorophenyl phenyl ether | | <10 | <10 | <10 | <10 | <10 |
| N-nitrosodiphenylamine | | <10 | <10 | <10 | <10 | <10 |
| 4-bromophenyl phenyl ether | | <10 | <10 | <10 | <10 | <10 |
| hexachlorobenzene | | <10 | <10 | <10 | <10 | <10 |
| phenanthrene | | <10 | <10 | <10 | <10 | <10 |
| anthracene | | <10 | <10 | <10 | <10 | <10 |
| di-n-butyl phthalate | | 13 | 15 | 14 | 13 | 12 |
| fluoranthene | | <10 | <10 | <10 | <10 | <10 |
| benzidine | | <50 | <50 | <50 | <50 | <50 |
| pyrene | | <10 | <10 | <10 | <10 | <10 |
| butyl benzyl phthalate | | <10 | <10 | <10 | <10 | <10 |
| 3,3'-dichlorobenzidine | | <30 | <30 | <30 | <30 | <30 |
| benzo(a)anthracene | | <10 | <10 | <10 | <10 | <10 |
| bis(2-ethylhexyl)phthalate | | <10 | <10 | <10 | <10 | <10 |
| chrysene | | <10 | <10 | <10 | <10 | <10 |
| di-n-octyl phthalate | | <10 | <10 | <10 | <10* | <10 |
| benzo(b)fluoranthene | | <10 | <10 | <10 | <10 | <10 |
| benzo(k)fluoranthene | | <10 | <10 | <10 | <10 | <10 |
| benzo(a)pyrene | | <10 | <10 | <10 | <10 | <10 |
| indeno(1,2,3-cd)pyrene | | <10 | <10 | <10 | <10 | <10 |
| dibenzo(a,h)anthracene | | <10 | <10 | <10 | <10 | <10 |
| benzo(ghi)perylene | | <10 | <10 | <10 | <10 | <10 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR PRIORITY POLLUTANT
BASE/NEUTRAL EXTRACTABLE COMPOUNDS BY GC/MS

(all results in ug/L)

U-4195.10

| Compound | E & E Lab. No. 86- | 8369 | Method Blank | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9140 | | | | |
| bis(2-chloroethyl)ether | | <10 | <10 | | | |
| 1,3-dichlorobenzene | | <10 | <10 | | | |
| 1,4-dichlorobenzene | | <10 | <10 | | | |
| 1,2-dichlorobenzene | | <10 | <10 | | | |
| bis(2-chloroisopropyl)ether | | <10 | <10 | | | |
| N-nitrosodipropylamine | | <10 | <10 | | | |
| hexachloroethane | | <10 | <10 | | | |
| nitrobenzene | | <10 | <10 | | | |
| isophorone | | <10 | <10 | | | |
| bis(2-chloroethoxy)methane | | <10 | <10 | | | |
| 1,2,4-trichlorobenzene | | <10 | <10 | | | |
| naphthalene | | <10 | <10 | | | |
| hexachlorobutadiene | | <10 | <10 | | | |
| hexachlorocyclopentadiene | | <10 | <10 | | | |
| 2-chloronaphthalene | | <10 | <10 | | | |
| dimethyl phthalate | | <10 | <10 | | | |
| acenaphthylene | | <10 | <10 | | | |
| fluorene | | <10 | <10 | | | |
| acenaphthene | | <10 | <10 | | | |
| 2,4-dinitrotoluene | | <10 | <10 | | | |
| 2,6-dinitrotoluene | | <10 | <10 | | | |
| diethylphthalate | | <10 | <10 | | | |
| 4-chlorophenyl phenyl ether | | <10 | <10 | | | |
| N-nitrosodiphenylamine | | <10 | <10 | | | |
| 4-bromophenyl phenyl ether | | <10 | <10 | | | |
| hexachlorobenzene | | <10 | <10 | | | |
| phenanthrene | | <10 | <10 | | | |
| anthracene | | <10 | <10 | | | |
| di-n-butyl phthalate | | 13 | 11 | | | |
| fluoranthene | | <10 | <10 | | | |
| benzidine | | <50 | <50 | | | |
| pyrene | | <10 | <10 | | | |
| butyl benzyl phthalate | | <10 | <10 | | | |
| 3,3'-dichlorobenzidine | | <30 | <30 | | | |
| benzo(a)anthracene | | <10 | <10 | | | |
| bis(2-ethylhexyl)phthalate | | <10 | <10 | | | |
| chrysene | | <10 | <10 | | | |
| di-n-octyl phthalate | | <10 | <10 | | | |
| benzo(b)fluoranthene | | <10 | <10 | | | |
| benzo(k)fluoranthene | | <10 | <10 | | | |
| benzo(a)pyrene | | <10 | <10 | | | |
| indeno(1,2,3-cd)pyrene | | <10 | <10 | | | |
| dibenzo(a,h)anthracene | | <10 | <10 | | | |
| benzo(ghi)perylene | | <10 | <10 | | | |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENTS, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALYSIS FOR
ORGANOPHOSPHOROUS PESTICIDES BY GC

(all results in ug/L)

U-4195.14

| | E & E Lab. No. 86- | Blank | 8364 | 8365* | 8366* | 8367* | 8368 | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9/30/86 | 9008 | 9009 | 9044 | 9045 | 9200 | |
| Naled | | <0.10 | <0.10 | 80.10 | <0.10 | <0.10 | <0.10 | |
| Phorate | | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | |
| Disulfoton | | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | |
| Chlorpyrifos | | <0.30 | <0.30 | <0.30 | 0.46 | 0.38 | <0.30 | |
| Dimethoate | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | |
| Malathion | | <0.30 | <0.30 | 0.30 | <0.30 | 0.43 | <0.30 | |
| Mevinphos | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | |
| Parathion | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | |
| Methyl parathion | | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | <0.30 | |
| Diazinon | | <0.60 | <0.60 | <0.60 | <0.60 | <0.60 | <0.60 | |
| Methyl azinphos | | <1.5 | <1.5 | <1.5 | <1.5 | <1.5 | <1.5 | |

*Sample confirmed - results positive.

ECOLOGY AND ENVIRONMENT'S, INC.
ANALYTICAL SERVICES CENTER

RESULTS OF WATER ANALSIS FOR
PRIORITY POLLUTANT PESTICIDES, PCBs, AND HERBICIDES BY GC

(all results in ug/L)

U-4195.13

| | E & E Lab. No. 86- | Blank | 8364 | 8365 | 8366 | 8367 | 8368 | |
|---|---|---|---|---|---|---|---|---|
| Compound | Sample Identity | 9/30/86 | 9008 | 9009 | 9044 | 9045 | 9200 | |
| Aldrin | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| a-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| b-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| g-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| d-BHC | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| Chlordane | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | |
| 4,4'-DDD | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| 4,4'-DDE | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| 4,4'-DDT | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Dieldrin | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Endosulfan I | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| Endosulfan II | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Endosulfin sulfate | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Endrin | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Endrin aldehyde | | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | |
| Heptachlor | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| Heptachlor epoxide | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| PCB - 1016 | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | |
| PCB - 1221 | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | |
| PCB - 1232 | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | |
| PCB - 1242 | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | |
| PCB - 1248 | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | |
| PCB - 1254 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| PCB - 1260 | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| Toxaphene | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | |
| 2,4-D | | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | <0.50 | |
| 2,4,5-TP (Silvex) | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |
| 2,4,5-T | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | |

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-4195.15

| Compound | E & E Lab. No. 86- | Blank | 8364 | 8365 | 8366 | 8367 |
|---|---|---|---|---|---|---|
| | Sample Identity | 10/1/86 | 9008 | 9009 | 9044 | 9045 |
| phenol | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| 2-chlorophenol | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| 2-nitrophenol | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| 2,4-dimethylphenol | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| 2,4-dichlorophenol | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| 4-chloro-3-methylphenol | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| 2,4,6-trichlorophenol | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| 2,4-dinitrophenol | | <13 | <13 | <13 | <13 | <13 |
| 4-nitrophenol | | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| 4,6-dinitro-2-methylphenol | | <16 | <16 | <16 | <16 | <16 |
| pentachlorophenol | | <7.4 | <7.4 | <7.4 | <7.4 | <7.4 |

*Compound present below measurable detection limit.

ECOLOGY AND ENVIRONMENT'S, INC.
A N A L Y T I C A L  S E R V I C E S  C E N T E R

RESULTS OF WATER ANALYSIS FOR
PHENOLS BY GC

(all results in ug/L)

U-4195.16

| Compound | E & E Lab. No. 86- | 8368 | 8369 | | | |
|---|---|---|---|---|---|---|
| | Sample Identity | 9200 | 9140 | | | |
| phenol | | <5.0 | <5.0 | | | |
| 2-chlorophenol | | <5.0 | <5.0 | | | |
| 2-nitrophenol | | <5.0 | <5.0 | | | |
| 2,4-dimethylphenol | | <5.0 | <5.0 | | | |
| 2,4-dichlorophenol | | <5.0 | <5.0 | | | |
| 4-chloro-3-methylphenol | | <5.0 | <5.0 | | | |
| 2,4,6-trichlorophenol | | <5.0 | <5.0 | | | |
| 2,4-dinitrophenol | | <13 | <13 | | | |
| 4-nitrophenol | | <5.0 | <5.0 | | | |
| 4,6-dinitro-2-methylphenol | | <16 | <16 | | | |
| pentachlorophenol | | <7.4 | <7.4 | | | |

*Compound present below measurable detection limit.

ecology and environment, inc.
International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-4195.11

| Job No.: | U-4195 | | RE: | DF-2000 | | |
|---|---|---|---|---|---|---|
| Sample Date: | 9/26/86 | | P.O. No.: | | | |
| Date Received: | 9/27/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Water | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 8364 | 8365 | 8366 | 8367 | 8368 | 8369 |
| Customer No. | 9008 | 9009 | 9044 | 9045 | 9200 | 9140 |
| Sample Identity | | | | | | |
| | Results in: mg/L unless noted | | | | | |
| Total Dissolved Solids | 190 | 110 | 310 | 180 | 13 | NR |
| Oil and Grease | 1.2 | 1.3 | 1.7 | 1.4 | 0.1 | 3.4 |
| Antimony | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 |
| Beryllium | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Cadmium | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Chromium | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Copper | <0.02 | <0.02 | <0.02 | <0.02 | 0.049 | <0.02 |
| Lead | <0.005 | <0.005 | 0.007 | <0.005 | <0.005 | 0.03 |
| Nickel | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Silver | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| Thallium | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |
| Zinc | <0.05 | <0.05 | 0.061 | <0.05 | <0.05 | 0.355 |

NR: Not requested.

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.

H-443 Supervising Analyst: _____

Date: _____

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International Specialists in the Environment

# LABORATORY REPORT

FOR

REESE AIR FORCE BASE

U-4195.12

| | | | | | | |
|---|---|---|---|---|---|---|
| Job No.: | U-4195 | | RE: | DF-2000 | | |
| Sample Date: | 9/26/86 | | P.O. No.: | | | |
| Date Received: | 9/27/86 | | Sampled By: | E & E, Inc. | | |
| Sample Type: | Water | | Delivered By: | Federal Express | | |
| E & E Lab. No. 86- | 8385 | Blank | | | | |
| Customer No. | 9140 | | | | | |
| Sample Identity | | | | | | |
| | Results in: mg/L unless noted | | | | | |
| Total Dissolved Solids | 920 | NA | | | | |
| Oil and Grease | NR | NA | | | | |
| Antimony | NR | <0.15 | | | | |
| Beryllium | NR | <0.01 | | | | |
| Cadmium | NR | <0.01 | | | | |
| Chromium | NR | <0.05 | | | | |
| Copper | NR | <0.02 | | | | |
| Lead | NR | <0.005 | | | | |
| Nickel | NR | <0.1 | | | | |
| Silver | NR | <0.04 | | | | |
| Thallium | NR | <0.20 | | | | |
| Zinc | NR | <0.05 | | | | |

NR: Not requested.
NA: Not applicable.

Analytical References:

"Methods for the Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983.



Supervising Analyst: [illegible]

Date: [illegible]

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-4195.17

| Parameter | E & E Laboratory No. 86-8364 | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| chlorobenzene | | <0.20 | <0.20 | -- |
| 1,2-dichlorobenzene | | <0.40 | <0.40 | -- |
| 1,3-dichlorobenzene | | <0.40 | <0.40 | -- |
| 1,4-dichlorobenzene | | <0.30 | <0.30 | -- |
| benzene | | <0.20 | <0.20 | -- |
| total xylenes | | <1.0 | <1.0 | -- |
| toluene | | <0.20 | <0.20 | -- |
| ethyl benzene | | <0.20 | <0.20 | -- |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-4195.18

| Compound | E & E Laboratory No. 86- | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| carbon tetrachloride | 8369 | <0.12 | 10.0 | 10.5 | 105 |
| 1,2-dichloroethane | 8369 | <0.03 | 10.0 | 12.5 | 125 |
| 1,1,1-trichloroethane | 8369 | <0.03 | 10.0 | 11.4 | 114 |
| 1,1-dichloroethane | 8369 | <0.07 | 10.0 | 11.2 | 112 |
| chloroethane | 8369 | <0.52 | 10.0 | 11.5 | 115 |
| chloroform | 8369 | <0.05 | 10.0 | 11.2 | 112 |
| trans-1,2-dichloroethene | 8369 | <0.10 | 10.0 | 10.9 | 109 |
| methylene chloride | 8369 | <0.25 | 10.0 | 14.2 | 142 |
| chloromethane | 8369 | <0.08 | 10.0 | 13.6 | 136 |
| bromomethane | 8369 | <1.18 | 10.0 | 15.3 | 153 |
| bromoform | 8369 | <0.20 | 10.0 | 9.26 | 92.6 |
| bromodichloromethane | 8369 | <0.10 | 10.0 | 10.6 | 106 |
| trichloroethene | 8369 | <0.12 | 10.0 | 11.3 | 113 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY OF SURROGATE SPIKES

U-4195.20

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| Nitrobenzene-D5 | 8364 | 100 | 56 | 56 |
| | 8365 | 100 | 57 | 57 |
| | 8366 | 100 | 54 | 54 |
| | 8367 | 100 | 62 | 62 |
| | 8368 | 100 | 56 | 56 |
| | 8369 | 100 | 67 | 67 |
| 2-Fluorobiphenyl | 8364 | 100 | 55 | 55 |
| | 8365 | 100 | 58 | 58 |
| | 8366 | 100 | 57 | 57 |
| | 8367 | 100 | 63 | 63 |
| | 8368 | 100 | 64 | 64 |
| | 8369 | 100 | 66 | 66 |
| Terphenyl-D14 | 8364 | 100 | 88 | 88 |
| | 8365 | 100 | 69 | 69 |
| | 8366 | 100 | 63 | 63 |
| | 8367 | 100 | 81 | 81 |
| | 8368 | 100 | 84 | 84 |
| | 8369 | 100 | 66 | 66 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT
RECOVERY OF SURROGATE SPIKES

U-4195.21

| Compound | E & E Laboratory No. 86- | Amount Added (ug/L) | Amount Determined (ug/L) | Percent Recovery |
|---|---|---|---|---|
| Phenol-D5 | 8364 | 200 | 52 | 26 |
| | 8365 | 200 | 52 | 26 |
| | 8366 | 200 | 50 | 25 |
| | 8367 | 200 | 45 | 22.5 |
| | 8368 | 200 | 48 | 24 |
| | 8369 | 200 | 50 | 25 |
| 2-Fluorophenol | 8364 | 200 | 84 | 42 |
| | 8365 | 200 | 108 | 54 |
| | 8366 | 200 | 108 | 54 |
| | 8367 | 200 | 88 | 44 |
| | 8368 | 200 | 110 | 55 |
| | 8369 | 200 | 86 | 43 |
| 2,4,6-Tribromophenol | 8364 | 200 | 119 | 59.5 |
| | 8365 | 200 | 147 | 73.5 |
| | 8366 | 200 | 156 | 78 |
| | 8367 | 200 | 144 | 72 |
| | 8368 | 200 | 128 | 64 |
| | 8369 | 200 | 123 | 61.5 |

These recoveries are acceptable to EPA Contract Lab Program (CLP) guidelines.

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-4195.27

| Parameter | E & E Laboratory No. 86-DI Spike | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 2,4,6-trichlorophenol | | <5.0 | 40 | 25 | 63 |
| 4-chloro-3-methylphenol | | <5.0 | 40 | 23 | 58 |
| 2-chlorophenol | | <5.0 | 40 | 20 | 50 |
| 2,4-dimethylphenol | | <5.0 | 40 | 23 | 58 |
| 2,4-dichlorophenol | | <5.0 | 40 | 21 | 53 |
| 2-nitrophenol | | <5.0 | 40 | 25 | 63 |
| 4-nitrophenol | | <5.0 | 40 | 12 | 30 |
| 4,6-dinitro-2-methylphenol | | <16 | 40 | 22 | 55 |
| pentachlorophenol | | <7.4 | 40 | 16 | 40 |
| phenol | | <5.0 | 40 | 6.6 | 16 |

QUALITY CONTROL FOR ACCURACY: PERCENT RECOVERY
FOR SPIKED WATER SAMPLES

U-4195.19

| Parameter | E & E Laboratory No. 86-DI Spike | Original Value | Amount Added | Amount Determined | Percent Recovery |
|---|---|---|---|---|---|
| | | (ug/L) | | | |
| 2,4-D | | <0.50 | 10.0 | 8.8 | 88 |
| Silvex (2,4,5-TP) | | <0.05 | 10.0 | 7.6 | 76 |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-4195.25

| Parameter | E & E Laboratory No. 86-8365 | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Aldrin | | <0.05 | <0.05 | -- |
| a-BHC | | <0.05 | <0.05 | -- |
| b-BHC | | <0.05 | <0.05 | -- |
| g-BHC | | <0.05 | <0.05 | -- |
| d BHC | | <0.05 | <0.05 | -- |
| Chlordane | | <0.50 | <0.50 | -- |
| 4,4'-DDD | | <0.10 | <0.10 | -- |
| 4,4'-DDE | | <0.10 | <0.10 | -- |
| Dieldrin | | <0.10 | <0.10 | -- |
| Endosulfan 1 | | <0.05 | <0.05 | -- |
| Endosulfan II | | <0.10 | <0.10 | -- |
| Endosulfan sulfate | | <0.10 | <0.10 | -- |
| Endrin | | <0.10 | <0.10 | -- |
| Endrin aldehyde | | <0.10 | <0.10 | -- |
| Heptachlor | | <0.05 | <0.05 | -- |
| Heptchlor epoxide | | <0.05 | <0.05 | -- |
| PCB - 1016 | | <0.50 | <0.50 | -- |
| PCB - 1221 | | <0.50 | <0.50 | -- |
| PCB - 1232 | | <0.50 | <0.50 | -- |
| PCB - 1242 | | <0.50 | <0.50 | -- |
| PCB - 1248 | | <0.50 | <0.50 | -- |
| PCB - 1254 | | <1.0 | <1.0 | -- |
| PCB - 1260 | | <1.0 | <1.0 | -- |
| Toxaphene | | <1.0 | <1.0 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-4195.26

| Parameter | E & E Laboratory No. 86-8365 | (ug/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Naled | | <0.10 | <0.10 | -- |
| Phorate | | <0.15 | <0.15 | -- |
| Disulfoton | | <0.20 | <0.20 | -- |
| Chlorpyrifos | | <0.30 | <0.30 | -- |
| Dimethoate | | <0.30 | <0.30 | -- |
| Malathion | | 0.30 | 0.85 | 96 |
| Mevinphos | | <0.30 | <0.30 | -- |
| Parathion | | <0.30 | <0.30 | -- |
| Methyl parathion | | <0.30 | <0.30 | -- |
| Diazinon | | <0.60 | <0.60 | -- |
| Methyl azinphos | | <1.5 | <1.5 | -- |

QUALITY CONTROL FOR PRECISION
RESULTS OF ANALYSIS OF REPLICATE
ANALYSES OF WATER SAMPLES

U-4195.23

| Parameter | E & E Laboratory No. 86- | (mg/L) | | Relative Percent Difference (RPD) |
|---|---|---|---|---|
| | | Original Analysis | Replicate Analysis | |
| Cadmium | 8369 | <0.01 | <0.01 | -- |
| Chromium | 8369 | <0.05 | <0.05 | -- |
| Copper | 8369 | <0.02 | <0.02 | -- |
| Lead | 8369 | 0.030 | 0.030 | 0 |
| Nickel | 8369 | <0.1 | <0.1 | -- |
| Thallium | 8369 | <0.20 | <0.20 | -- |
| Zinc | 8369 | 0.355 | 0.347 | 2.3 |

QUALITY CONTROL FOR ACCURACY:
PERCENT DIFFERENCE--EPA QUALITY ASSURANCE MATERIALS

U-4195.22

| Parameter | Concentrations in ug/L | | Percent Difference |
|---|---|---|---|
| | Known | Determined | |
| Arsenic | 20.0 | 19.5 | 2.5 |
| Cadmium | 940 | 931 | 1.0 |
| Chromium | 1030 | 998 | 3.1 |
| Copper | 1030 | 1002 | 2.7 |
| Lead | 17.0 | 17.3 | 1.8 |
| Mercury | 4.4 | 4.46 | 1.4 |
| Nickel | 1020 | 997 | 2.2 |
| Zinc | 1010 | 997 | 1.3 |
| Total Dissolved Solids | 320 | 340 | 6.2 |
| Oil and Grease | 22,600 | 16,400 | 27.4 |

CHROMATOGRAPHIC CONDITIONS

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent Hexane Analytical Method SW8080

Instrument Varian 6000 #2A Pesticides

COLUMN

Type Glass

Length 6'

Diameter 4mm ID

Liquid Phase (% wt.) 3% OV-1

Support Supelcoport

Mesh 100/120

CARRIER GAS Nitrogen

Rotameter NA

Inlet Pressure, psig 60

Flow Rate, mL/min. 60

CHART SPEED, cm/min. 0.5

DETECTOR Electron Capture

Range 10

Attenuation 64

TEMPERATURE, °C

Detector 300

Injection Port 220

Column

Initial 200 Isothermal

Program NA

Final NA

238082

CHART SPEED 0.5 CM/MIN
ATTEN: 64 ZERO: 10% 5 MIN/TICK

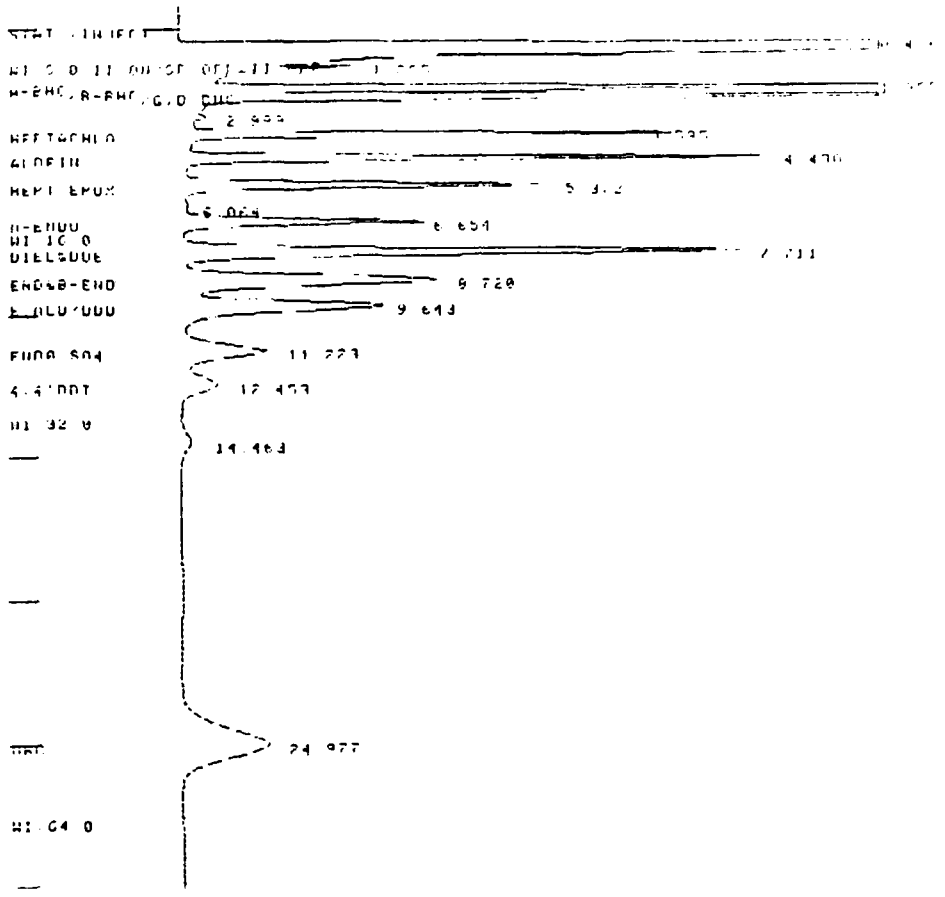
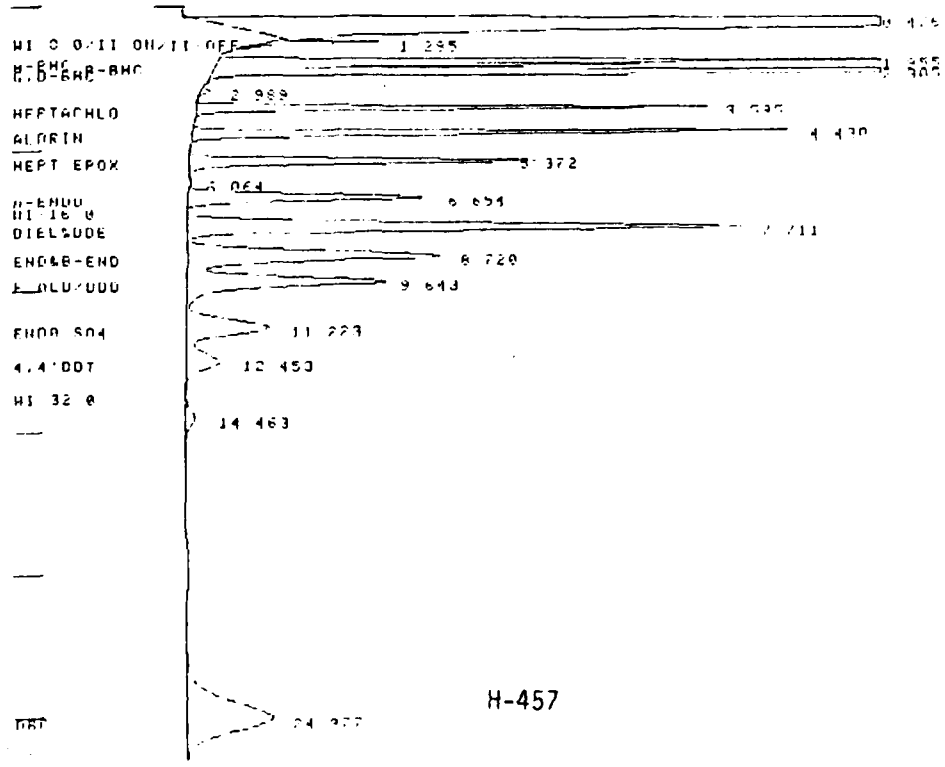
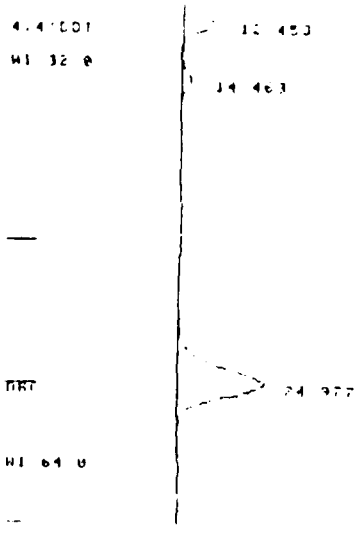



CHART SPEED 0.5 CM/MIN
ATTEN: 64 ZERO: 10% 5 MIN/TICK






CHANNEL: 1A  1  TITLE: RUN# 2  11:04  11 JUL 86

SAMPLE: 4 150-10  METHOD: CONIA  CALCULATION: ES  CAL:0

| PEAK NO | PEAK NAME | RESULT FACTOR | TIME (MIN) | TIME OFFSET | AREA COUNTS | SEP CODE | WID (SEC) |
|---|---|---|---|---|---|---|---|
| 1 | | | 1.285 | | 351408 | BV | 5.44 |
| 2 | | | 1.429 | | 36666 | VB | 2.25 |
| 3 | A-BHC | 0.0000160 | 1.955 | -0.005 | 12400319 | BV | 5.19 |
| 4 | B-BHC | 0.0001120 | 2.006 | 0.016 | 1785372 | VV | 5.50 |
| 5 | G,D-BHC | 0.0000190 | 2.305 | -0.005 | 21204858 | VB | 9.00 |
| 6 | | | 2.989 | | 60715 | BB | 6.94 |
| 7 | HEPTACHLO | 0.0000500 | 3.595 | 0.015 | 3444527 | BB | 6.94 |
| 8 | ALDRIN | 0.0000440 | 4.430 | 0.030 | 4583250 | BB | 8.75 |
| 9 | HEPT EPOX | 0.0000540 | 5.372 | -0.020 | 3702162 | BV | 11.25 |
| 10 | A-ENDO | 0.0000630 | 6.664 | 0.046 | 3160462 | VB | 14.44 |
| 11 | DIELSDOL | 0.0000500 | 7.711 | 0.059 | 7960544 | BV | 15.58 |
| 12 | ENDSU-ENU | 0.0000740 | 8.720 | 0.070 | 5403810 | VV | 24.19 |
| 13 | E.ALD/DDD | 0.0000930 | 9.643 | 0.067 | 4311455 | VV | 22.75 |
| 14 | ENDO 504 | 0.0000820 | 11.223 | 0.127 | 24311170 | VV | 32.56 |
| 15 | 4,4'DDT | 0.0001690 | 12.453 | 0.147 | 1185315 | VB | 35.81 |
| 16 | | | 14.463 | | 30.7105 | BB | 35.19 |
| 17 | DDE | 0.0001920 | 24.977 | -0.273 | 5221097 | BB | 68.50 |

TOTALS:  -0.056  77593008

DETECTED PKS: 19  REJECTED PKS: 2

AMT STD: 1.00000

NOISE: 182.8  OFFSET: -12

NOTES:
NOTEBOOK:230 93 ANALYST: K.JUREK
SECURE AREA:D JOB#: 0 3615
INST. VARIAN 6000#2 A ECD 10X1 ATT:64
COLUMN: 6' GLASS 4MM ID 100/120 SUPELCOPORT
LIQUID PHASE:3% OV-1
CARRIER GAS: N2 @ 60 ML/MIN.
DET:300 C INJ:220 C
200 C ISOTHERMAL  4 UL INJECTION

POST RUN:
SAVE FILE: RAW  CAT:3

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent Hexane Analytical Method SW8080

Instrument Varian 6000 #28 Pesticides

COLUMN

Type Glass

Length 6'

Diameter 4mm ID

Liquid Phase (% wt.) 1.5% SP2250 1.95% SP2401

Support Supelcoport

Mesh 100/120

CARRIER GAS Nitrogen

Rotameter NA

Inlet Pressure, psig 80

Flow Rate, mL/min. 60

CHART SPEED, cm/min. 0.5

DETECTOR Electron Capture

Range 10

Attenuation 16

TEMPERATURE, °C

Detector 300

Injection Port 220

Column

Initial 200 Isothermal

Program NA

Final NA

238082

CHART SPEED 0.5 CM/MIN
ATTEN: 16 ZERO: 10% 5 MIN/TICK

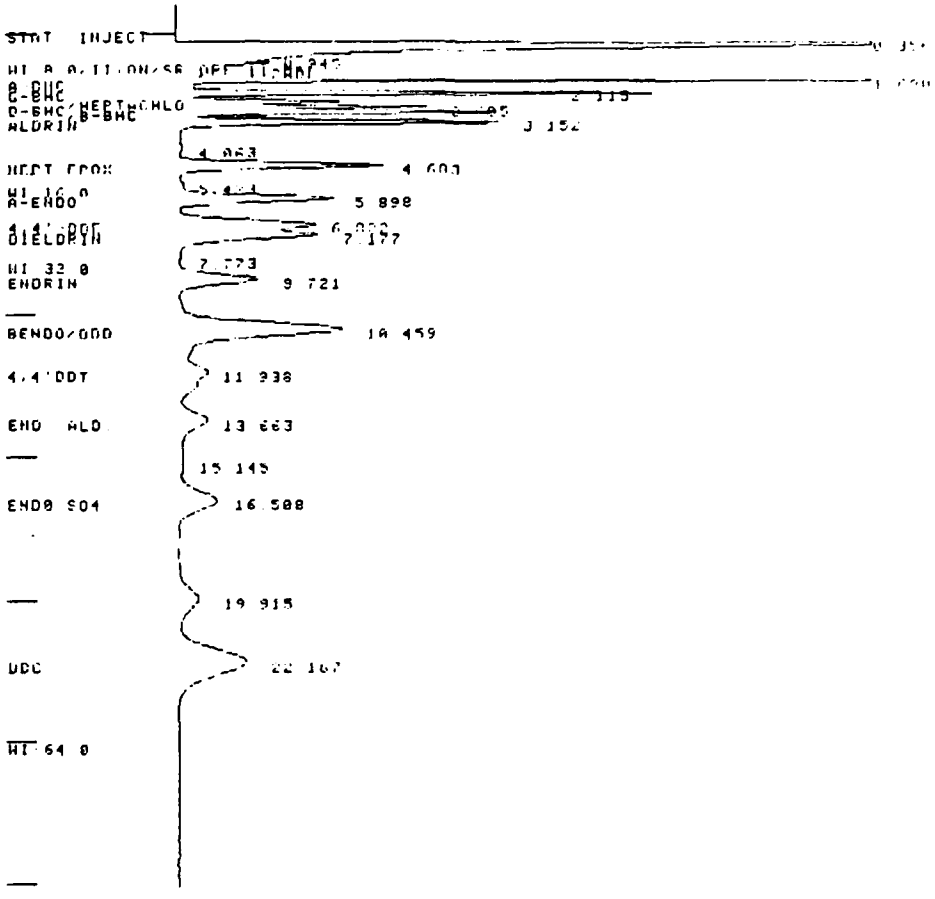
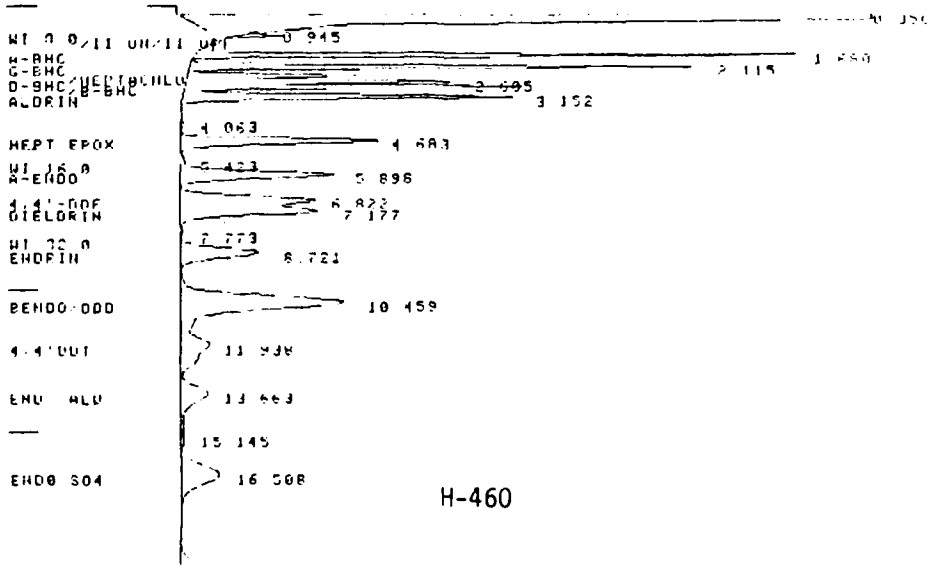
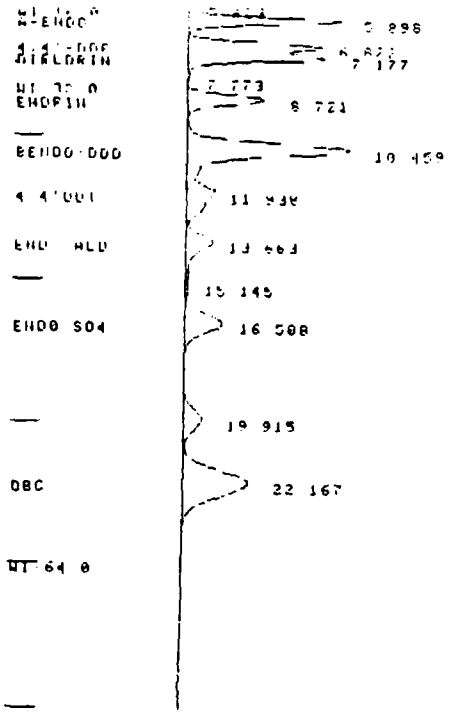



CHART SPEED 0.5 CM/MIN
ATTEN: 16 ZERO: 10% 5 MIN/TICK






CHANNEL: 1B - 1 TITLE: RUN# 2 10:16 9 JUL 86

SAMPLE: 4-158-10 METHOD: CONFB CALCULATION: ES - CALIB

| PEAK NO | PEAK NAME | RESULT FACTOR | TIME (MIN) | TIME OFFSET | AREA COUNTS | SEP CODE | WID (SEC) |
|---|---|---|---|---|---|---|---|
| 1 | A-BHC | 0.0002550 | 1.680 | 0.000 | 784744 | BV | 4.44 |
| 2 | G-BHC | 0.0003080 | 2.115 | 0.005 | 650188 | VV | 5.63 |
| 3 | HEPTACHLO | 0.0007720 | 2.408 | -0.002 | 258942 | VV | 7.06 |
| 4 | D-BHC | 0.0004730 | 2.605 | 0.005 | 422608 | VV | 7.44 |
| 5 | B-BHC | 0.0003410 | 2.805 | 0.005 | 586603 | VV | 7.75 |
| 6 | ALDRIN | 0.0003050 | 3.152 | 0.002 | 655517 | VB | 8.63 |
| 7 | HEPT EPOX | 0.0003310 | 4.683 | -0.007 | 605089 | BV | 12.88 |
| 8 | A-ENDO | 0.0003550 | 5.898 | 0.008 | 563309 | VV | 16.19 |
| 9 | 4,4'-DDE | 0.0003610 | 6.822 | -0.008 | 553493 | VV | ? 19.94 |
| 10 | DIELDRIN | 0.0003360 | 7.177 | -0.013 | 595009 | VV | ? 24.56 |
| 11 | ENDRIN | 0.0005050 | 8.721 | 0.001 | 395922 | VV | 22.94 |
| 12 | BENDO/DDD | 0.0003330 | 10.459 | -0.021 | 1199938 | VV | 30.63 |
| 13 | 4,4'DDT | 0.0006620 | 11.938 | -0.022 | 302184 | VV | 57.13 |
| 14 | END. ALD. | 0.0008410 | 13.663 | -0.027 | 237939 | VV | 38.06 |
| 15 | ENDO. SO4 @ | 16.51 | 15.145 | | 32565 | VV | ? 53.38 |
| 16 | | | 19.915 | | 212037 | BV | 54.06 |
| 17 | DBC | 0.0010790 | 22.167 | -0.043 | 926929 | VB | 62.31 |

TOTALS: -0.117 8992916

DETECTED PKS: 25 REJECTED PKS: 8

AMT STD: 1.00000

NOISE: 34.3 OFFSET: -6

NOTES:
NOTEBOOK:230-90 ANALYST: K.JUREK
SECURE AREA:D JOB# *U-3615*
INST: VARIAN 6000#2 8 ECD 10X1 ATT:16
COLUMN: 6' GLASS 4MM ID 100/120 SUPELCOPORT
PHASE:1.5% SP2250/1.95% SP2401
CARRIER GAS: N2 @ 60 ML/MIN.
DET:300 C INJ:220 C
200 C ISOTHERMAL 4 UL INJECTION

POST RUN:
SAVE FILE: RAW CB279

ecology and environment, inc.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent NA Analytical Method EPA 602

Instrument Varian 6000 #3 _____

COLUMN

Type Stainless Steel

Length 6'

Diameter 1/8"

Liquid Phase (% wt.) 5% SP1200 1.75% Bentone-34

Support Supelcoport

Mesh 100/120

CARRIER GAS Nitrogen

Rotameter NA

Inlet Pressure, psig 60

Flow Rate, mL/min. 40

CHART SPEED, cm/min. 0.5

DETECTOR Photometric Ionization(Tracor)

Range $10^{-12}$

Attenuation 128

TEMPERATURE, °C

Detector 300

Injection Port 220

Column

Initial 50 2 min.

Program 6/min.

Final 90

PURGE AND TRAP

Purge time 12 min. Temp. 30

Purge flow 40ml/min.

Desorb time 4 min. Temp. 180

Bake time 15 min. Temp. 200

238082

CHART SPEED 0.5 CM/MIN
ATTEN: 128 ZERO: 10% 5 MIN/TICK

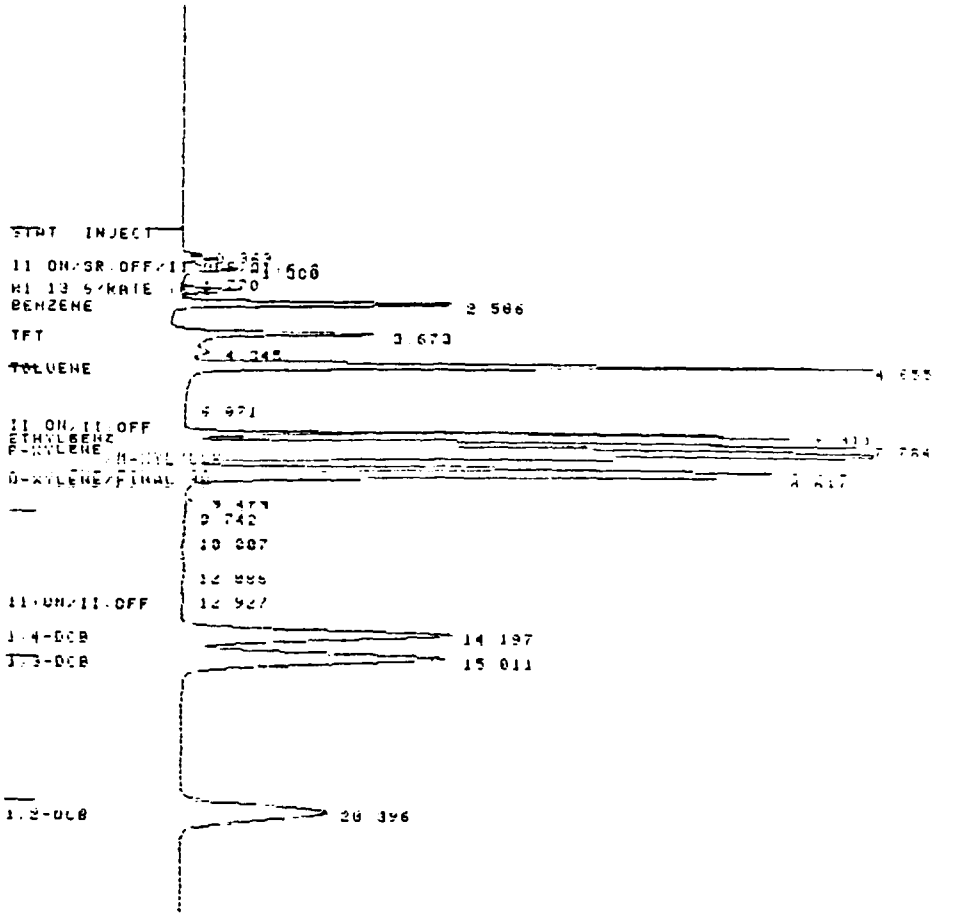
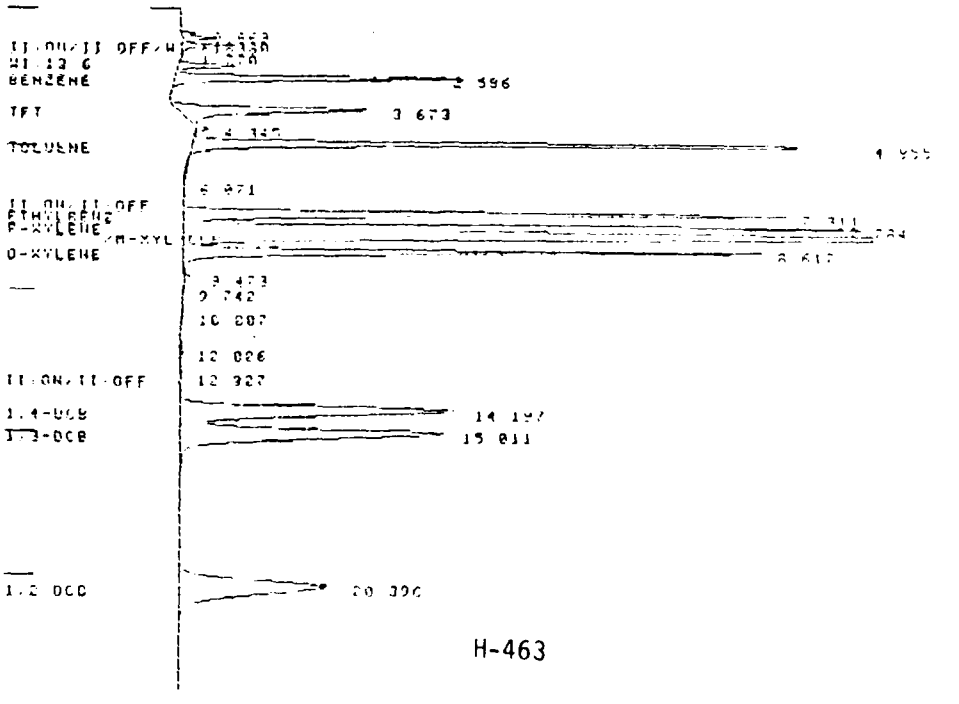
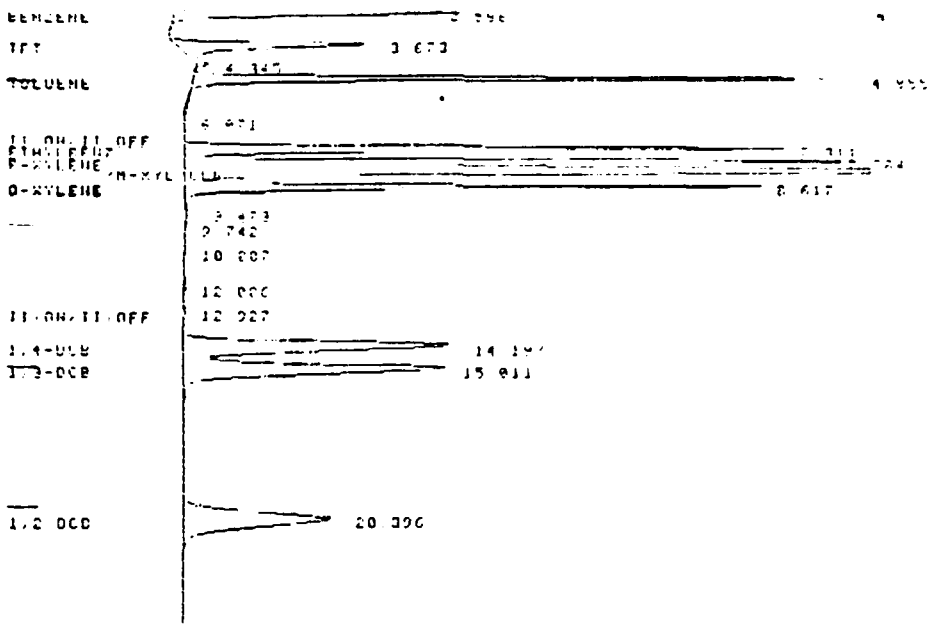



CHART SPEED 0.5 CM/MIN
ATTEN: 128 ZERO: 10% 5 MIN/TICK






*Continuing RT + Cal check OK*

CHANNEL: 3A - 1 TITLE: RUN# 11 15:55 30 JUN 86

SAMPLE: 5-158-62 *all at 50ng* METHOD: PURGRO CALCULATION: EC - ANALYS

| PEAK NO | PEAK NAME | RESULT ~~ppb~~ ng | TIME (MIN) | TIME OFFSET | AREA COUNTS | SEP CODE | WID (SEC) |
|---|---|---|---|---|---|---|---|
| 1 | | 0.0000 | 1.380 | | 63502 | BB | 5.56 |
| 2 | | 0.0000 | 2.130 | | 98766 | BV | 7.81 |
| 3 | BENZENE | 54.2760 | 2.586 | -0.004 | 452046 | VB | 7.81 |
| 4 | TET | 34.6020 | 3.673 | -0.057 | 398647 | BB | 10.94 |
| 5 | | 0.0000 | 4.345 | | 22298 | VV | V 25.63 |
| 6 | TOLUENE | 49.6718 | 4.855 | -0.025 | 1101133 | VV | 9.56 |
| 7 | ETHYLBENZ | 49.9130 | 7.311 | -0.009 | 1092438 | BV | 9.94 |
| 8 | P-XYLENE | 49.9268 | 7.784 | -0.006 | 1214070 | VV | 10.00 |
| 9 | M-XYL/OLB | 100.9507 | 8.067 | -0.013 | 2825019 | VV | 10.00 |
| 10 | O-XYLENE | 50.5219 | 8.617 | -0.003 | 1114023 | VV | 10.00 |
| 11 | | 0.0000 | 9.473 | | 13071 | I | 12.50 |
| 12 | | 0.0000 | 9.742 | | 2812 | I | V 47.25 |
| 13 | | 0.0000 | 10.807 | | 2225 | BB | 11.00 |
| 14 | | 0.0000 | 12.006 | | 9127 | BB | V 21.56 |
| 15 | 1,4-DCB | 50.4527 | 14.197 | -0.003 | 1030532 | BV | V 21.25 |
| 16 | 1,3-DCB | 50.4030 | 15.011 | -0.009 | 1112465 | VB | V 23.38 |
| 17 | 1,2-DCB | 50.4174 | 20.396 | 0.006 | 886027 | BB | V 33.94 |

TOTALS: 941.2243 -0.123 11519061

DETECTED PKS: 23 REJECTED PKS: 6

DIVISOR: 1.00000 MULTIPLIER: 1.00000

NOISE: 54.9 OFFSET: 41

NOTES:
NOTEBOOK:232-35 ANALYST:K. JUREK
SECURE AREA:E JOB# U-*3615*
INST:VARIAN 6000#3 PID 10-12 ATTN:128
COLUMN:6' SS 1/8" OD 100/120 SUPELCOPORT
PHASE:5% SP1200/1.75% BENTONE-34
CARRIER GAS: N2 @ 40 ML/MIN.
DET: 300 C INJ:220 C
INIT 50C HOLD 2MIN TO 90C 6MIN

POST RUN:
SAVE FILE: RAW FID000

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent NA Analytical Method EPA601/SW8010

Instrument Varian 3700 _____

COLUMN

Type Stainless Steel

Length 6'

Diameter 1/8" OD

Liquid Phase (% wt.) N-Octane

Support Porasil-C

Mesh 80/100

CARRIER GAS Nitrogen

Rotameter NA

Inlet Pressure, psig 60

Flow Rate, mL/min. 40

HALL DETECTOR

Mode Halogen

Solvent 1-Propanol

Solvent flow, mL/min. 0.5

Reactor tube temperature, °C 950

Reactor gas Hydrogen

Reactor gas flow, mL/min. 50

CHART SPEED, cm/min. 0.5

DETECTOR Hall Electrolytic Conductivity

Range 10

Attenuation 256

TEMPERATURE, °C

Detector 950

Injection Port 220

Column

Initial 50 3 min.

Program 6/min.

Final 170

PURGE AND TRAP

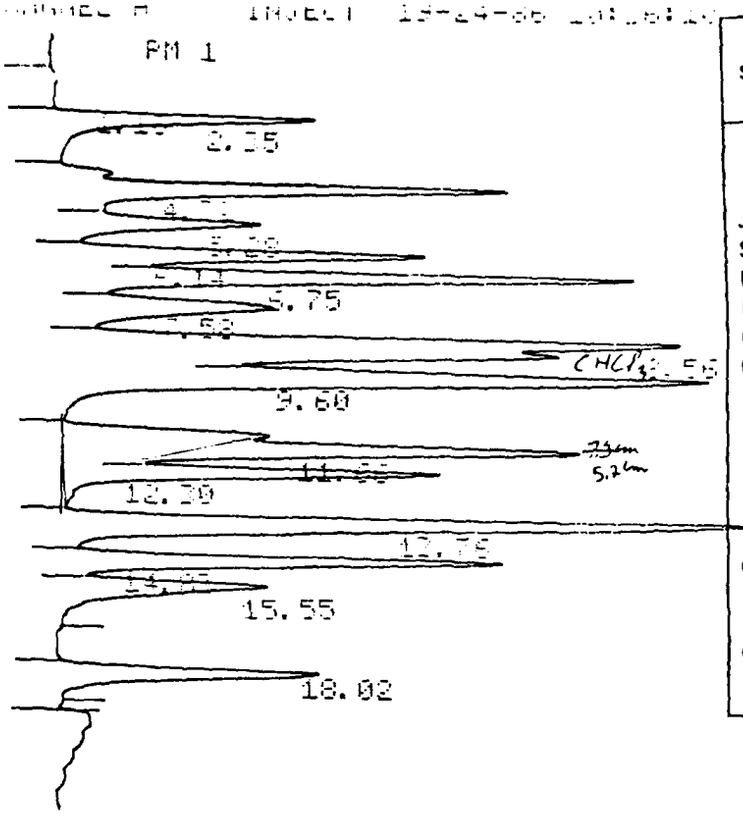
Purge time 11 min. Temp. 30

Purge flow 40 ml/min.

Desorb time 4 min. Temp. 180

Bake time 15 min. Temp. 220

238082




Lab Notebook 215 Page 106 Yes No
Security information for samples recorded in lab notebook? (If no, place discrepancy form in job file.)

## GAS CHROMATOGRAPHY CONDITIONS

U-3614

Job No.: ____ ID No.: ____
Secure Area Received From: E
Date: 7/7/86 Initials: PAB
Instrument: 3700B
Operator: P. Brutscher Date: 7/7/86
Column Detector: FID
Length: 6'55 Range: ____
Dia.: 1/8" O.D. Atten.: 256X
Liquid Phase: V-Octane
Wt. %: —
Support: Supelcoport Temperature, °C
Mesh: 80/100 Det.: 950 Inj.: 220
Carrier Gas: N2 Col. Initial: 50/3 min
Col. Back Press.: 33 psig. Col. Final: 170/2 min
Flow Rate: 40 ml/min. Col. Rate: 6°C/min
Chart Speed: 0.5 cm/min Solvent: ____
Amt. Injected: 5 ml pkt Concen.: ____

1-150-64 19-24-86 10:36:10 CH= "A" FS= 1.

FILE 1. METHOD 0. RUN 55 INDEX 54

ANALYST: P BRUTSCHER

| PEAK# | AREA% | RT | AREA BC |
|---|---|---|---|
| 1 | 0.152 | 1.18 | 88339 02 |
| 2 | 3.663 | 2.35 | 2129663 02 |
| 3 | 7.143 | 4.32 | 4152672 02 |
| 4 | 3.282 | 5.28 | 1907916 02 |
| 5 | 5.023 | 6.14 | 2920196 02 |
| 6 | 8.063 | 6.75 | 4687145 02 |
| 7 | 4.562 | 7.58 | 2651949 02 |
| 8 | 14.997 | 8.56 | 8718168 02 |
| 9 | 13.66 | 9.6 | 7940946 08 |
| 10 | 10.578 | 11.66 | 6149248 06 |
| 11 | 5.244 | 12.3 | 3048374 06 |
| 12 | 10.786 | 12.76 | 6270592 06 |
| 13 | 5.644 | 14.83 | 3281298 06 |
| 14 | 3.56 | 15.55 | 2069549 07 |
| 15 | 3.643 | 18.02 | 2117983 01 |
| TOTAL | 100. | | 58134044 |

FI= 1. FE= 1. MN= 0.
PRESS 'ENTER' TO SKIP ENTRY
FILE NAME=" BLANK
TIME FUNCTION VALUE
TT= 4.A FAULT 100: AT 9110

CHANNEL A INJECT 19-24-86 11:14:57 H-466

PM 1

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent NA Analytical Method SW8150

Instrument Varian 6000 #28 Herbicides Column

COLUMN

Type Glass

Length 6'

Diameter 4 mm ID

Liquid Phase (% wt.) 1.5% SP2250/ 1.95% SP2401

Support Supelcoport

Mesh 100/120

CARRIER GAS N2

Rotameter NA

Inlet Pressure, psig 60

Flow Rate, mL/min. 60

CHART SPEED, cm/min. 1.0

DETECTOR ECD

Range 10 x 1

Attenuation 16

TEMPERATURE, °C

Detector 300

Injection Port 220

Column

Initial 185 Isothermal

Program _____

Final _____

238082

ATTEN: 16 ZERO: 10% 1 MIN/TICK

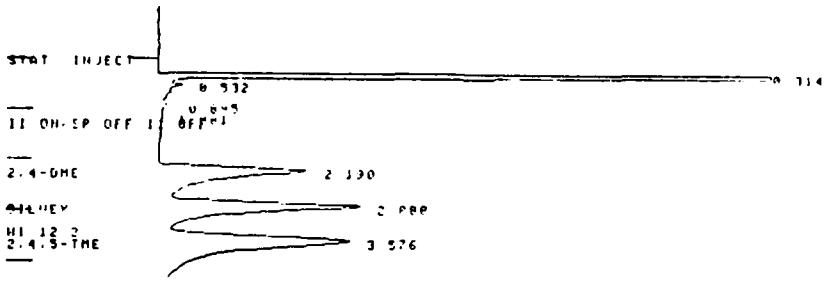
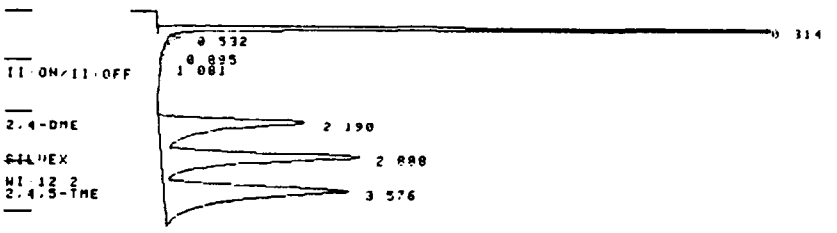



CHART SPEED 1.0 CM/MIN
ATTEN: 16 ZERO: 10% 1 MIN/TICK




CHANNEL: 1B - 1 TITLE: RUN# 2 17:09 8 AUG 86

SAMPLE: 2-158-2 METHOD: HERB CALCULATION: ES - CALIB

| PEAK NO | PEAK NAME | RESULT FACTOR | TIME (MIN) | TIME OFFSET | AREA COUNTS | SEP CODE | WI/2 (SEC) |
|---|---|---|---|---|---|---|---|
| 1 | 2,4-DME | 0.003705U | 2.190 | 0.010 | 539757 | BV | 12.75 |
| 2 | SILVEX | 0.000609U | 2.888 | -0.002 | 657323 | VV | ? 12.06 |
| 3 | 2,4,5-TME | 0.000602U | 3.576 | 0.016 | 810184 | VV | 15.88 |
| TOTALS: | | | | 0.024 | 2007264 | | |

DETECTED PKS: 8 REJECTED PKS: 5

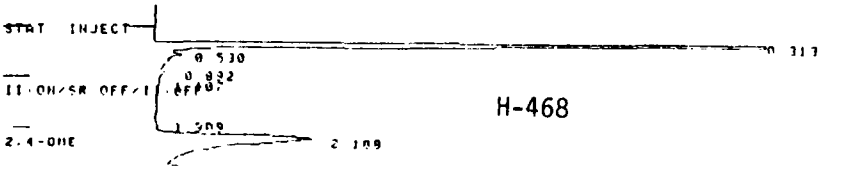
AMT STD: 1.00000

NOISE: 34.3 OFFSET: -5

NOTES:
NOTEBOOK:230-131 ANALST:RICHARD SAMSON
SECURE AREA:D JOB# 3825, 3826, 3788
INST. VARIAN 6000#28 ECD 10X1 ATT:16
COLUMN:6' GLASS 4MM ID 100/120 SUPELCOPORT
LIQUID PHASE:1.5% SP2250/1.95% SP2401
CARRIER GAS: N2 @ 60 ML/MIN.
DET: 300 C INJ: 220 C
185 C ISOTHERMAL 4 UL INJECTION

POST RUN:
SAVE FILE: RAW HERBIE119

CHART SPEED 1.0 CM/MIN
ATTEN: 16 ZERO: 10% 1 MIN/TICK



Reese.6

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent _____ Analytical Method SW8150

Instrument Varian 6000 #2B Herbicides Column

COLUMN

Type Glass

Length 6'

Diameter 4 mm ID

Liquid Phase (% wt.) 3% OV-1

Support Supelcoport

Mesh 100/120

CARRIER GAS N2

Rotameter NA

Inlet Pressure, psig 60

Flow Rate, mL/min. 60

CHART SPEED, cm/min. 1.0

DETECTOR ECD

Range 10 x 1

Attenuation 16

TEMPERATURE, °C

Detector 300

Injection Port 220

Column

Initial 175 Isothermal

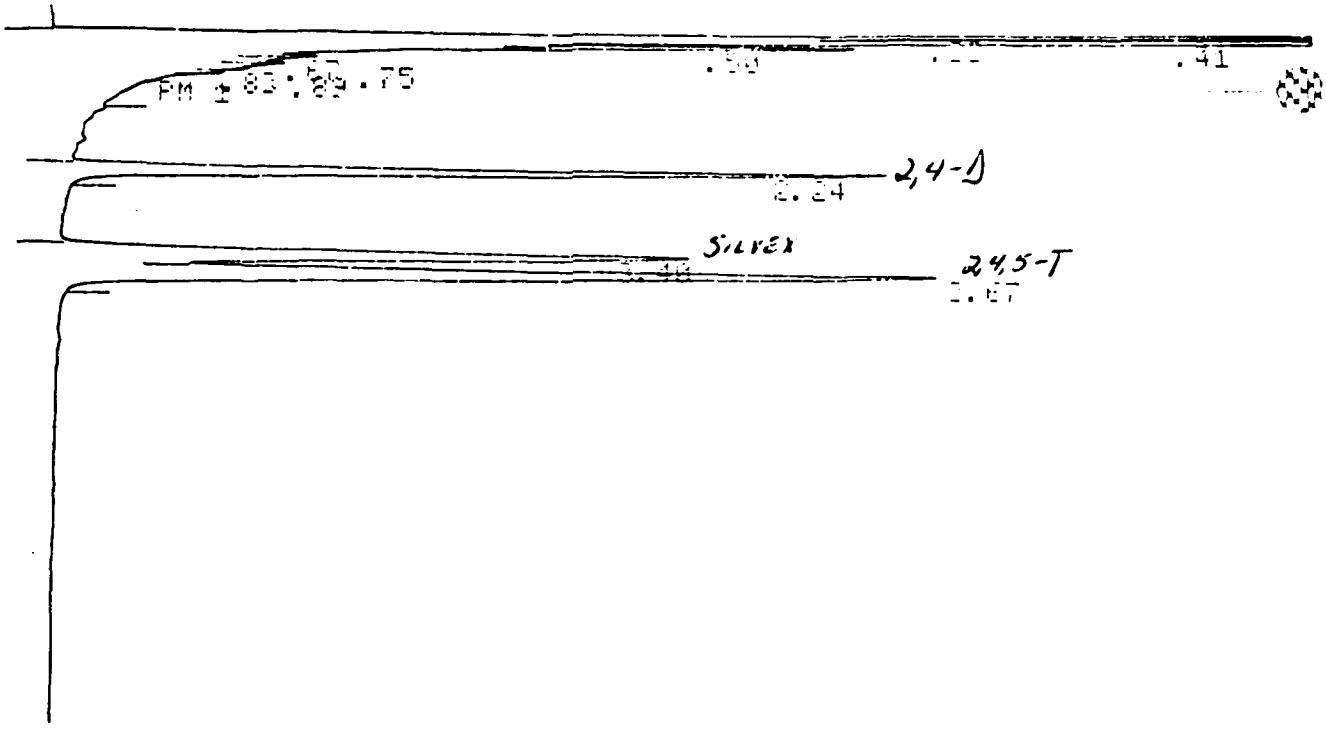
Program _____

Final _____

238082

CH= 1

CHANNEL A INJECT 08/15/86 10:26:02



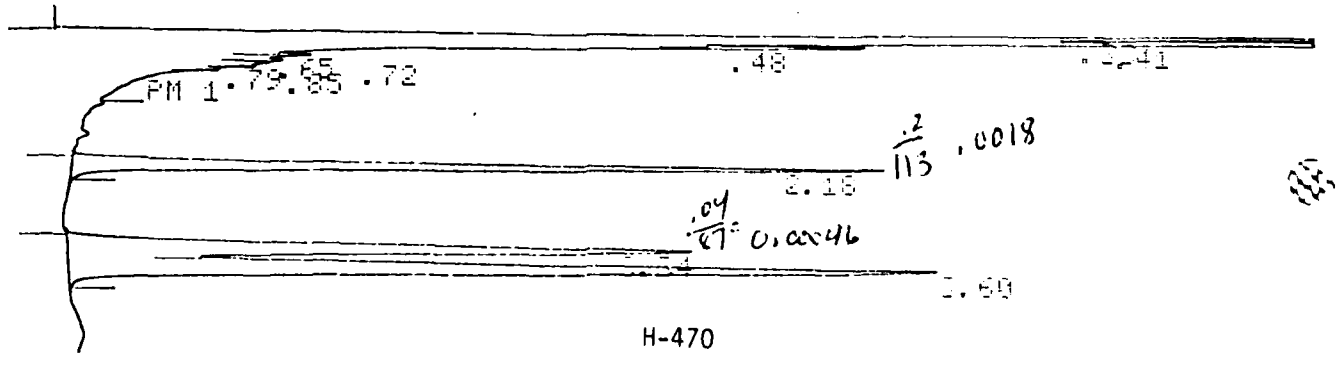

HERB STD. 2-158-2 08/15/86 10:26:02 CH= "A" PG= 1.

FILE 1. METHOD 0. RUN 3 INDEX 3

ANALYST: K. JUREK

| PEAK# | AREA% | RT | AREA 8C |
|---|---|---|---|
| 1 | 15.311 | 0.33 | 325358 02 |
| 2 | 55.278 | 0.41 | 1174687 02 |
| 3 | 5.089 | 0.5 | 108150 02 |
| 4 | 1.262 | 0.67 | 26823 02 |
| 5 | 1.05 | 0.75 | 22318 02 |
| 6 | 0.656 | 0.83 | 13939 02 |
| 7 | 1.603 | 0.89 | 34054 03 |
| 8 | 5.155 | 2.24 | 109556 01 |
| 9 | 5.824 | 3.4 | 123766 02 |
| 10 | 8.771 | 3.67 | 186395 03 |
| TOTAL | 100. | | 2125046 |

CHANNEL A INJECT 08/15/86 10:42:42



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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent _____ Analytical Method _____

Instrument Varian 6000A #1 Organophos

COLUMN

Type FCSS

Length 20m

Diameter 0.25 mm

Liquid Phase (% wt.) 0.25 DB-1

Support FSCC

*Mesh* _____

CARRIER GAS N2

Rotameter NA

Inlet Pressure, psig _____

Flow Rate, mL/min. 2

HALL DETECTOR

Mode _____

Solvent _____

Solvent flow, mL/min. _____

*Reactor tube temperature*, °C _____

Reactor gas _____

Reactor gas flow, mL/min. _____

FID GAS

Hydrogen, ml/min. _____

Air, ml/min. _____

CHART SPEED, cm/min. _____

DETECTOR FPD

*Range* $10^{-10}$

Attenuation 8

TEMPERATURE, °C

Detector 300

Injection Port 250

Column

Initial 100/2 min.

Program 8°/min.

Final 220

PURGE AND TRAP

Purge time _____ Temp. _____

Purge flow _____

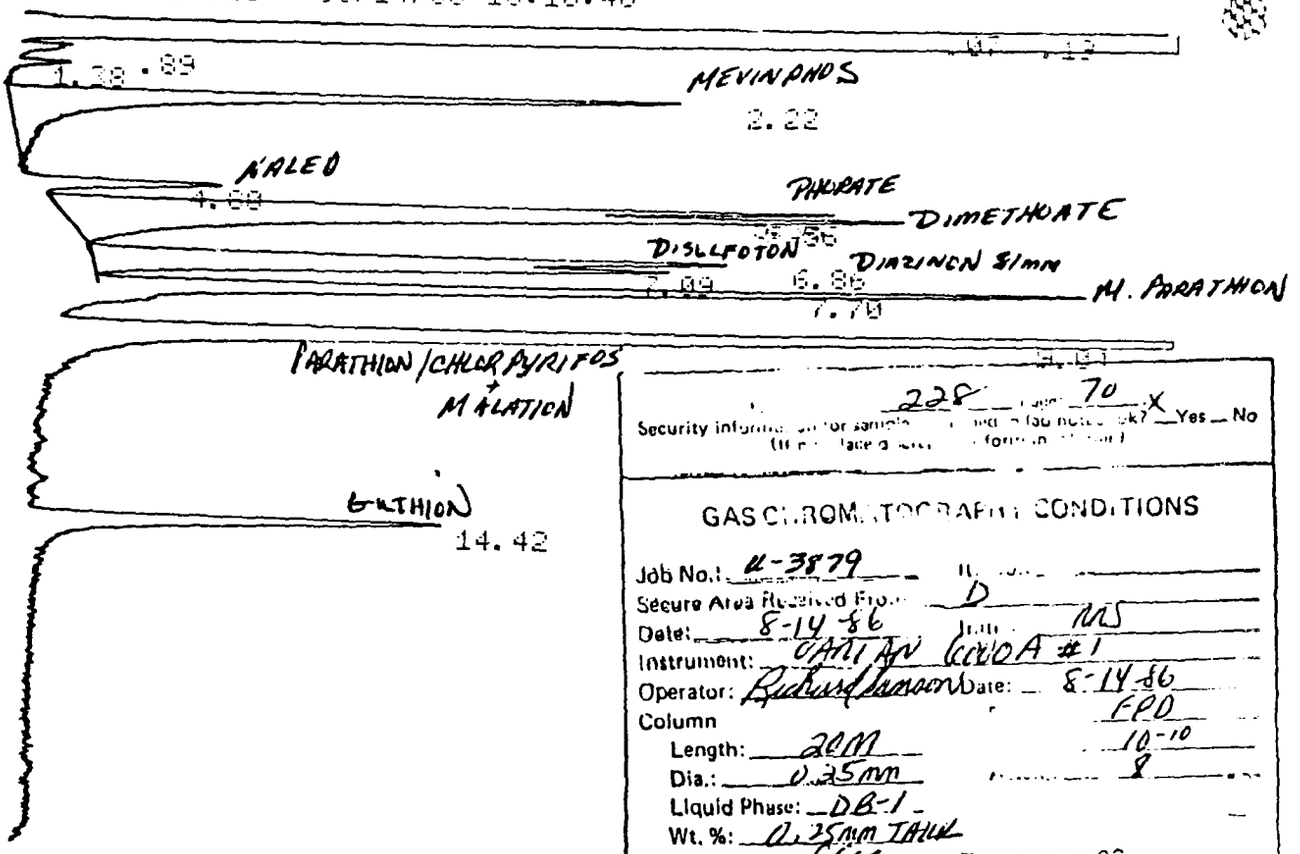
Desorb time _____ Temp. _____

Bake time _____ Temp. _____

238082

PRESS 'ENTER' TO SKIP ENTRY
FILE NAME=" ←3-158-66
TIME FUNCTION VALUE
TT= ←.A FAULT 100: AT 9110

CHANNEL A INJECT 08/14/86 18:10:46




228 70 X
Security information for sample ... (lab notebook)? Yes No
(If ... place a check ... form in ...)

GAS CHROMATOGRAPHY CONDITIONS

Job No.: U-3879
Secure Area Received From: D
Date: 8-14-86 Initials: MS
Instrument: GC/MS AN 6000A #1
Operator: Richard Samson Date: 8-14-86
Column FPD
Length: 20M 10-10
Dia.: 0.25mm 8
Liquid Phase: DB-1
Wt. %: 0.25um THICK
Support: FSCC Temperature °C
Mesh: Init: 300 Rate: 250
Carrier Gas: NITH= "A" Flow: 100cc 2min
Col. Back Press.: p.s.i. Final: 220
Flow Rate: 52 ml/min. Inj. Port Rate: @8°C/min
Chart Speed: 0.5cm/min
Amt. Inj. 2µl

3-158-66 08/14/86 18:10:46

FILE 1. METHOD 0. RUN 5

ANALYST: RICHARD SAMSON

| PEAK# | | AREA% | ug/ml | RT | AREA BC | | |
|---|---|---|---|---|---|---|---|
| 1 | | 90.05 | | 0.19 | 11056006 | 03 | |
| 2 | MEVINPHOS | 1.008 | 9.61 | 2.22 | 123701 | 01 | 95mm 0.101 |
| 3 | | 0.235 | | 4.8 | 28804 | 02 | |
| 4 | | 0.798 | | 5.38 | 97986 | 02 | |
| 5 | DIMETHOATE | 1.566 | 9.50 | 5.56 | 192327 | 03 | 120mm 0.079 |
| 6 | | 0.786 | | 6.86 | 96502 | 02 | |
| 7 | DIAZINON | 0.732 | 6.27 | 7.09 | 89818 | 02 | 8/MM 0.065 |
| 8 | | 1.275 | | 7.7 | 156544 | 03 | |
| 9 | P+M+C | 2.93 | 19.93 | 9.04 | 359716 | 01 | 5.54 |
| 10 | | 0.621 | | 14.42 | 76270 | 01 | |
| TOTAL | | 100. | | | 12277674 | | |

FI= 1. FE= 1. MN= 0.
PRESS 'ENTER' TO SKIP ENTRY
FILE NAME=" BLANK.168
TIME FUNCTION VALUE
TT= ←.A FAULT 100: AT 9110

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent _____ Analytical Method _____

Instrument HP5890A Phenol

COLUMN

Type Capillary

Length 30m

Diameter 0.32 mm

Liquid Phase (% wt.) 0.25 DB-5

Support FSCC

Mesh _____

CARRIER GAS He

Rotameter _____

Inlet Pressure, psig _____

Flow Rate, mL/min. 1.5

HALL DETECTOR

Mode _____

Solvent _____

Solvent flow, mL/min. _____

Reactor tube temperature, °C _____

Reactor gas _____

Reactor gas flow, mL/min. _____

FID GAS

Hydrogen, ml/min. 30

Air, ml/min. 400

CHART SPEED, cm/min. 0.5

DETECTOR FID

Range 2

Attenuation 2

TEMPERATURE, °C

Detector 300

Injection Port 250

Column

Initial 50/4 min.

Program 8°/min.

Final 300

PURGE AND TRAP

Purge time _____ Temp. _____

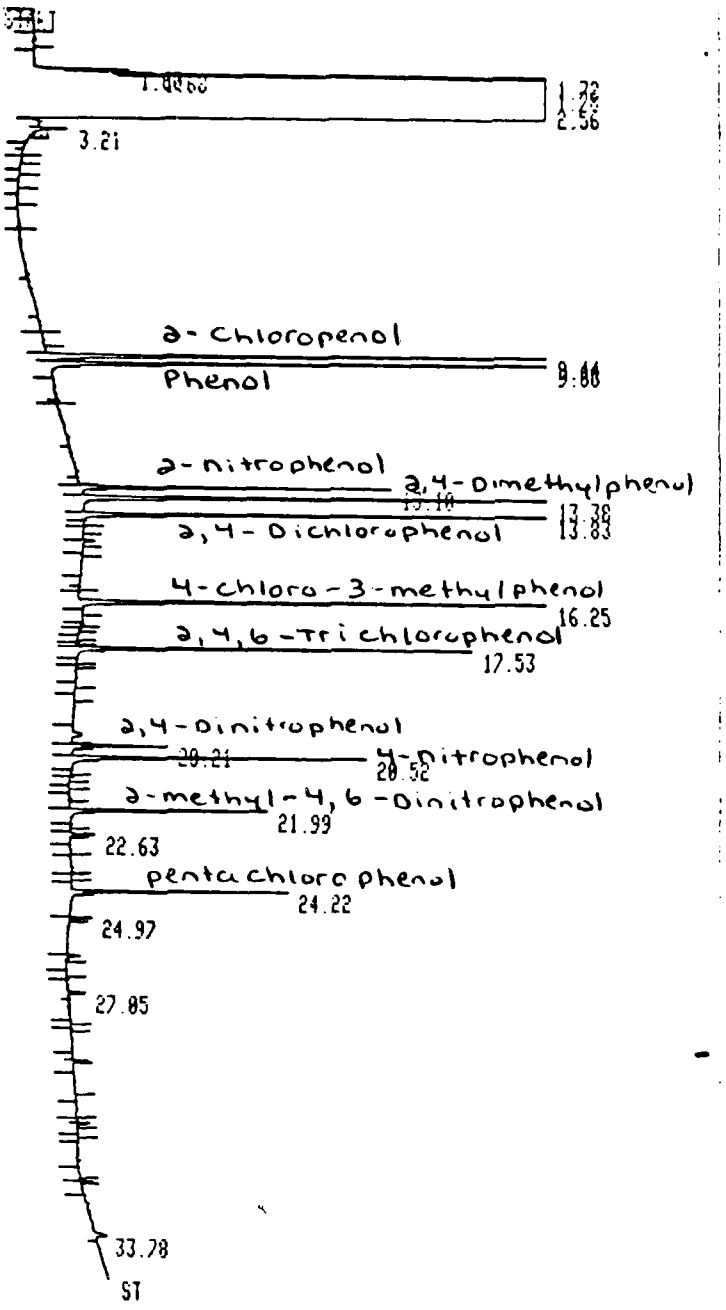
Purge flow _____

Desorb time _____ Temp. _____

Bake time _____ Temp. _____

238082

ID: 2-158-68




RUN # 2 AUG/29/86 10:27:25
WORKFILE ID: C
WORKFILE NAME:
ID: 2-158-68 PHENOL STD

AREA%

| RT | AREA | TYPE | AR/HT | AREA% |
|---|---|---|---|---|
| 1.60 | 10049 | D PV | 0.028 | 0.004 |
| 1.68 | 21778 | VV | 0.048 | 0.009 |
| 1.72 | 64351 | D VH | 0.021 | 0.028 |
| 1.78 | 2.2053E+08 | TSHH | 0.438 | 94.339 |
| 2.56 | 1.2419E+07 | SHB | 0.100 | 5.313 |
| 3.21 | 11634 | VB | 0.077 | 0.005 |
| 9.44 | 121050 | PB | 0.039 | 0.052 |
| 9.66 | 87683 | PB | 0.040 | 0.038 |
| 13.10 | 41146 | PB | 0.035 | 0.018 |
| 13.38 | 121550 | PB | 0.036 | 0.052 |
| 13.83 | 69586 | PB | 0.037 | 0.030 |

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent _____ Analytical Method _____

Instrument HP5890A Polynuclear Aromatic

COLUMN

Type FSCC

Length 30m

Diameter 0.32

Liquid Phase (% wt.) 0.25 DB-5

Support FSCC

Mesh _____

CARRIER GAS N2

Rotameter _____

Inlet Pressure, psig 60

Flow Rate, mL/min. 1.5

HALL DETECTOR

Mode _____

Solvent _____

Solvent flow, mL/min. _____

Reactor tube temperature, °C _____

Reactor gas _____

Reactor gas flow, mL/min. _____

FID GAS

Hydrogen, ml/min. 30

Air, ml/min. 400

CHART SPEED, cm/min. 0.5

DETECTOR FID

Range 3

Attenuation 4

TEMPERATURE, °C

Detector 300

Injection Port 300

Column

Initial 100°C 4 min.

Program 8°C/min.

Final 310°C

PURGE AND TRAP

Purge time _____ Temp. _____

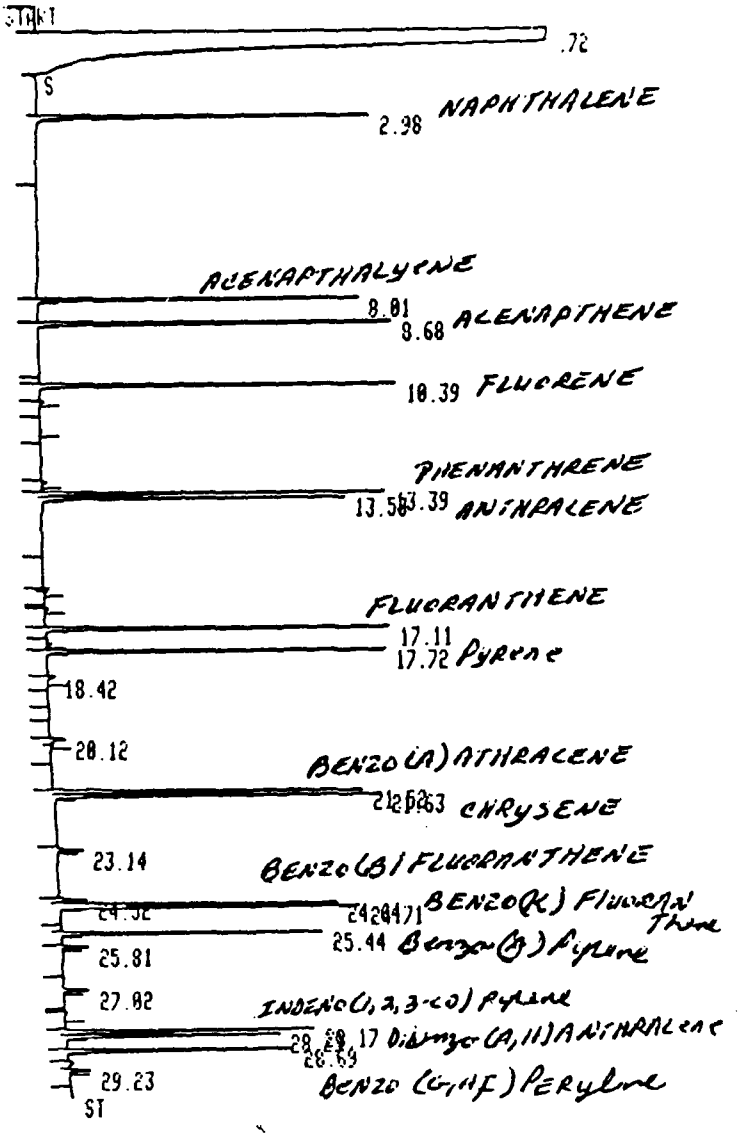
Purge flow _____

Desorb time _____ Temp. _____

Bake time _____ Temp. _____

238082

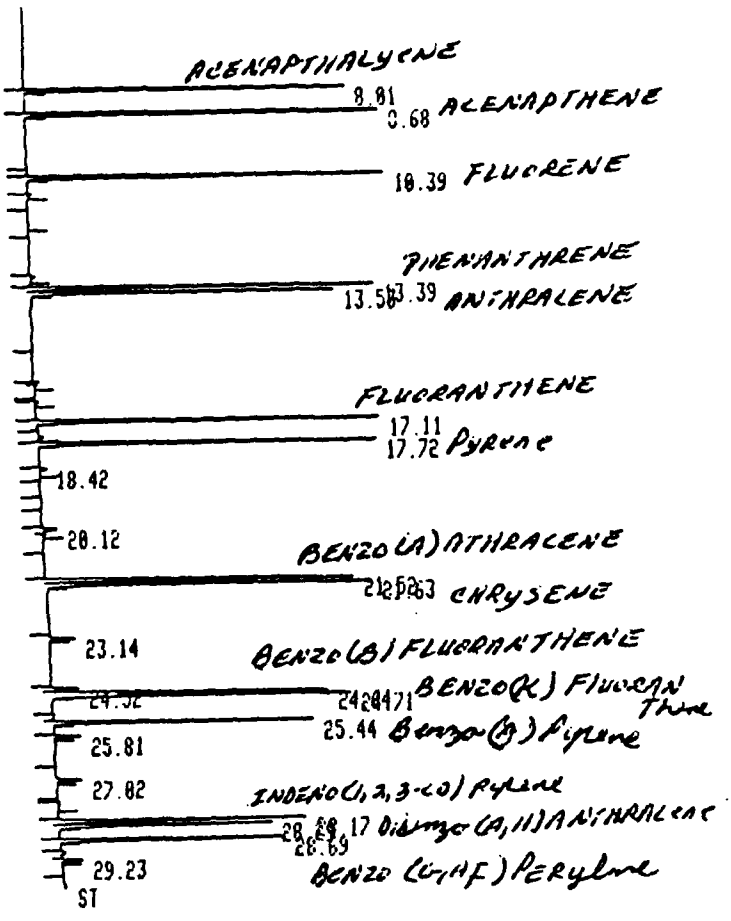
OP # 1 5 @
ID: 1 - 1 5 8 - 6 6 @




RUN # 11 AUG/13/86 10:09:57
WORKFILE ID: C
WORKFILE NAME:
ID: 1-158-66 PAH std 10ug/ml

AREA%

| RT | AREA | TYPE | AR/HT | AREA% |
|---|---|---|---|---|
| 0.72 | 9.2632E+07 | TSPB | 0.184 | 96.615 |
| 2.98 | 213730 | PB | 0.043 | 0.223 |
| 8.01 | 215520 | PB | 0.044 | 0.225 |
| 8.68 | 230440 | PB | 0.043 | 0.240 |
| 10.39 | 224590 | PB | 0.042 | 0.234 |
| 13.39 | 212490 | PV | 0.041 | 0.222 |
| 13.53 | 187440 | VB | 0.041 | 0.196 |
| 17.11 | 211280 | PB | 0.041 | 0.220 |
| 17.72 | 210740 | PB | 0.041 | 0.220 |
| 20.12 | 11842 | PP | 0.054 | 0.012 |
| 21.52 | 200180 | PV | 0.043 | 0.209 |
| 21.63 | 218910 | VB | 0.044 | 0.228 |
| 23.14 | 17932 | PB | 0.048 | 0.019 |
| 24.52 | 19232 | PP | 0.047 | 0.020 |
| 24.64 | 187790 | PV | 0.045 | 0.196 |




RUN # 11 AUG/13/86 10:09:57
WORKFILE ID: C
WORKFILE NAME:
ID: 1-158-66 PAH std 10ug/ml

AREA%

| RT | AREA | TYPE | AR/HT | AREA% |
|---|---|---|---|---|
| 0.72 | 9.2632E+07 | TSPB | 0.184 | 96.615 |
| 2.98 | 213730 | PB | 0.043 | 0.223 |
| 8.01 | 215520 | PB | 0.044 | 0.225 |
| 8.68 | 230440 | PB | 0.043 | 0.240 |
| 10.39 | 224590 | PB | 0.042 | 0.234 |
| 13.39 | 212490 | PV | 0.041 | 0.222 |
| 13.53 | 187440 | VB | 0.041 | 0.196 |
| 17.11 | 211280 | PB | 0.041 | 0.220 |
| 17.72 | 210740 | PB | 0.041 | 0.220 |
| 20.12 | 11842 | PP | 0.054 | 0.012 |
| 21.52 | 200180 | PV | 0.043 | 0.209 |
| 21.63 | 218910 | VB | 0.044 | 0.228 |
| 23.14 | 17932 | PB | 0.048 | 0.019 |
| 24.52 | 19232 | PP | 0.047 | 0.020 |
| 24.64 | 187790 | PV | 0.045 | 0.196 |
| 24.71 | 188360 | VB | 0.042 | 0.197 |
| 25.44 | 170780 | PB | 0.044 | 0.178 |
| 25.81 | 19854 | PB | 0.049 | 0.021 |
| 27.02 | 19555 | PB | 0.052 | 0.020 |
| 28.17 | 173010 | PV | 0.046 | 0.181 |
| 28.29 | 142850 | VB | 0.044 | 0.149 |
| 28.69 | 153680 | PB | 0.045 | 0.160 |
| 29.23 | 15486 | PB | 0.050 | 0.016 |

TOTAL AREA= 9.5877E+07
MUL FACTOR= 1.0000E+00

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent _____ Analytical Method 8080

Instrument Varian 3700B Pesticides

COLUMN

Type Glass

Length 6'

Diameter 4 mm

Liquid Phase (% wt.) 3% OV-1

Support Supelcoport

Mesh 100/120

CARRIER GAS N2

Rotameter _____

Inlet Pressure, psig _____

Flow Rate, mL/min. 60

HALL DETECTOR

Mode _____

Solvent _____

Solvent flow, mL/min. _____

Reactor tube temperature, °C _____

Reactor gas _____

Reactor gas flow, mL/min. _____

FID GAS

Hydrogen, ml/min. _____

Air, ml/min. _____

CHART SPEED, cm/min. _____

DETECTOR ECD

Range 10

Attenuation 16

TEMPERATURE, °C

Detector 300

Injection Port 220

Column

Initial _____

Program 190 isothermal

Final _____

PURGE AND TRAP

Purge time _____ Temp. _____

Purge flow _____

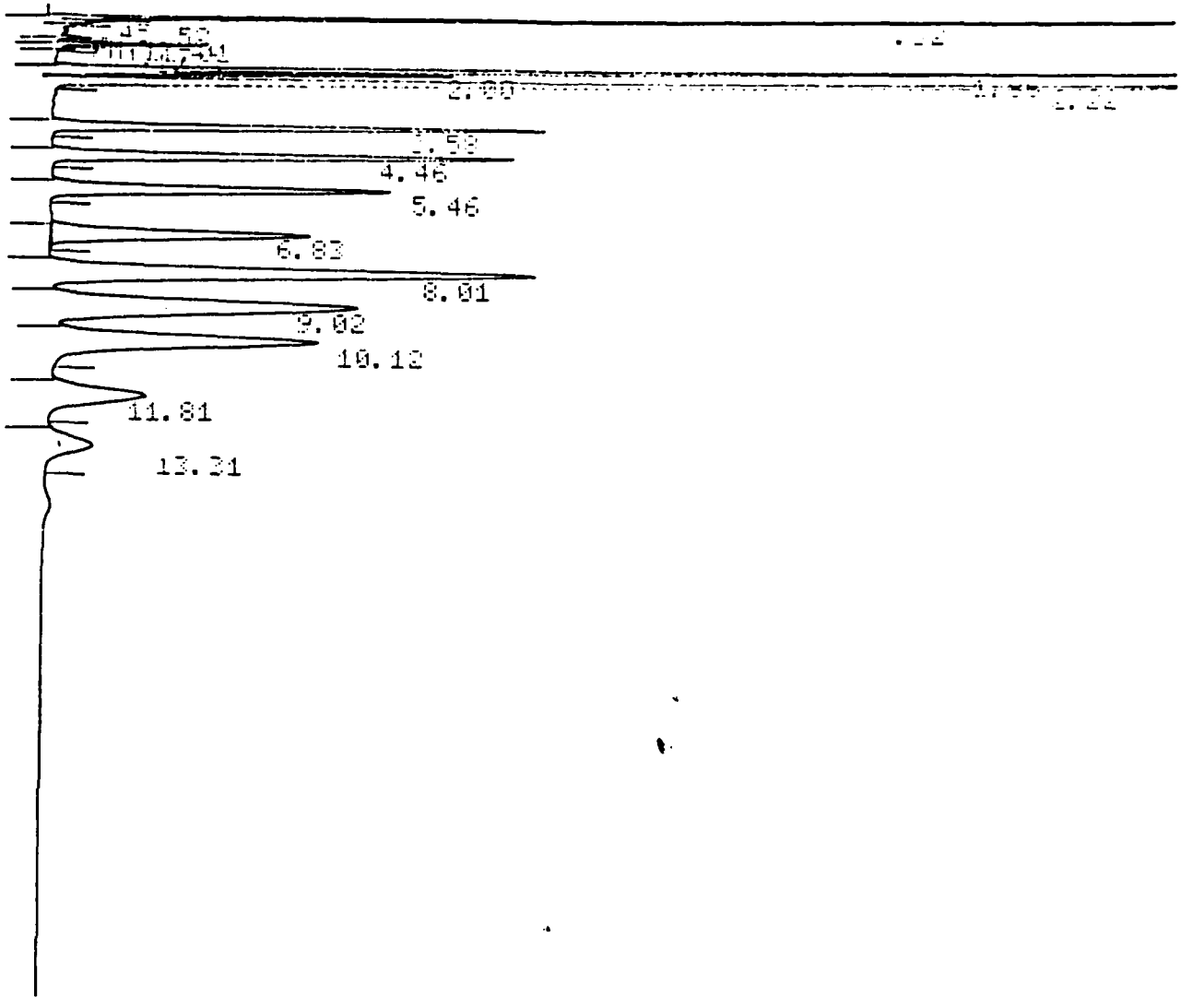
Desorb time _____ Temp. _____

Bake time _____ Temp. _____

238082

TT= *.A  FAULT  100: AT  9110

CHANNEL A  .INJECT  08/18/86 10:41:05




PEST MIX 4-158-73  08/18/86 10:41:05  CH= "A"  PS= 1.

FILE 1.  METHOD 0.  RUN 32  INDEX 32

ANALYST: K. JUREK

| PEAK# | | AREA% | RT | AREA BC |
|---|---|---|---|---|
| 1 | | 8.785 | 0.32 | 167518 03 |
| 2 | | 0.583 | 1.17 | 11123 01 |
| 3 | α-BHC | 8.898 | 1.86 | 169680 02 |
| 4 | β-BHC | 2.654 | 2. | 50610 02 |
| 5 | δ-&-BHC | 14.774 | 2.22 | 281721 03 |
| 6 | HEPT. | 5.922 | 3.58 | 112924 01 |
| 7 | ALDRIN | 6.869 | 4.46 | 130977 01 |
| 8 | HEPT. EPOX | 6.176 | 5.46 | 117778 01 |
| 9 | α-ENDOS | 5.911 | 6.83 | 112710 01 |
| 10 | DIELDRIN | 12.928 | 8.01 | 246528 02 |
| 11 | ENDO+β-ENDO4 | 287 | 9.02 | 215231 02 |
| 12 | END.ALD+DDD | 469 | 10.12 | 180559 03 |
| 13 | ENDO SO4 | 3.736 | 11.81 | 71238 01 |
| 14 | 4,4'-DDT | 2.01 | 13.31 | 38324 01 |

## CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent NA Analytical Method EPA 601

Instrument Varian 6000 #4 _____

COLUMN

Type Stainless Steel

Length 8'

Diameter 1/8"

Liquid Phase (% wt.) 1% SP1000

Support Carbopack B

Mesh 60/86

CARRIER GAS Nitrogen

Rotameter NA

Inlet Pressure, psig 60

Flow Rate, mL/min. 40

HALL DETECTOR

Mode Halogen

Solvent 1-Propanol

Solvent flow, mL/min. 0.5

Reactor tube temperature, °C 950

Reactor Gas Hydrogen

Reactor gas flow, mL/min. 50

CHART SPEED, cm/min. 0.5

DETECTOR Hall Electrolytic Conductivity

Range 10

Attenuation 256

TEMPERATURE, °C

Detector 950

Injection Port 220

Column

Initial 45/3 min.

Program 8/min.

Final 220

PURGE AND TRAP

Purge time 12 min. Temp. 30

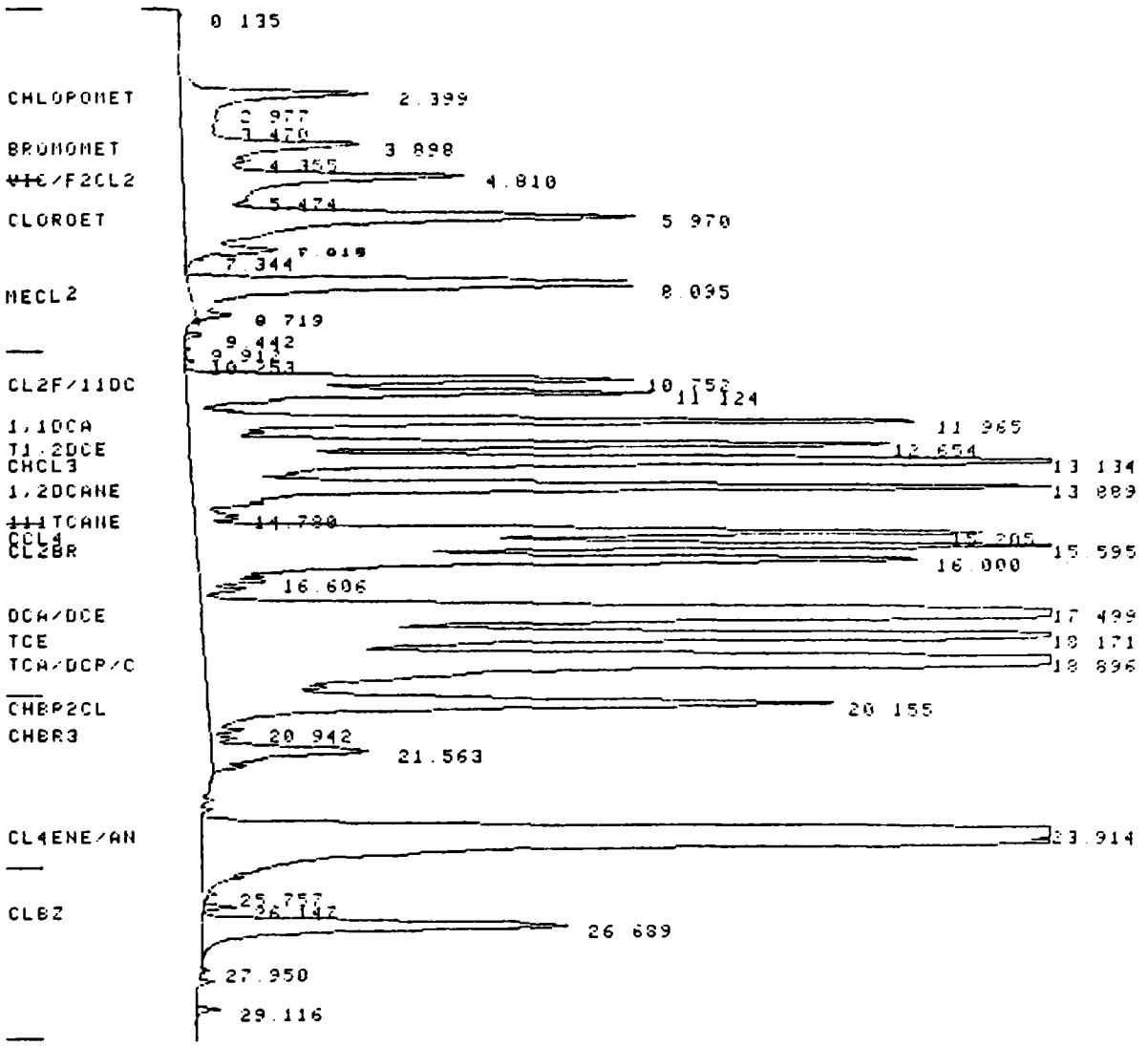
Purge flow 40ml/min.

Desorb time 4 min. Temp. 180

Bake time 15 min. Temp. 200

238082

CHART SPEED 0.5 CM/MIN
ATTEN: 128 ZERO: 5% 5 MIN/TICK




CHANNEL: 5A - 1 TITLE: RUN# 1 10:16 12 SEP 86

SAMPLE: 2-158-73 METHOD: HALL5A CALCULATION: ES - CALIB

| PEAK NO | PEAK NAME | RESULT FACTOR | TIME (MIN) | TIME OFFSET | AREA COUNTS | SEP CODE | W1/2 (SEC) |
|---|---|---|---|---|---|---|---|
| 1 | CHLOROMET | 0.097431U | 2.399 | -0.021 | 5131856 | BV | 14.00 |
| 2 | | | 2.977 | | 609296 | VV | ? 29.56 |
| 3 | | | 3.199 | | 743958 | VV | ? 21.88 |
| 4 | | | 3.470 | | 498294 | VV | ? 29.31 |
| 5 | BROMOMET | 0.087519U | 3.898 | -0.032 | 5713039 | VV | 20.00 |
| 6 | | | 4.355 | | 962101 | VV | ? 12.50 |
| 7 | VIC/F2CL2 | 0.103521U | 4.810 | -0.020 | 9659916 | VV | 18.31 |
| 8 | | | 5.474 | | 1126481 | VV | ? 27.50 |
| 9 | CLOROET | 0.032093U | 5.970 | -0.020 | 15579580 | VV | 18.13 |
| 10 | | | 7.015 | | 2168279 | VV | 16.44 |
| 11 | | | 7.344 | | 238084 | VV | ? 16.00 |

CHANNEL: SA - 1  TITLE: RUN# 1  10:16  12 SEP 86

SAMPLE: 2-158-73  METHOD: HALLSA  CALCULATION: ES - CALIB

| PEAK NO | PEAK NAME | RESULT FACTOR | TIME (MIN) | TIME OFFSET | AREA COUNTS | SEP CODE | | W1/2 (SEC) |
|---|---|---|---|---|---|---|---|---|
| 1 | CHLOROMET | 0.097431U | 2.399 | -0.021 | 5131856 | BV | | 14.00 |
| 2 | | | 2.977 | | 609296 | VV | ? | 29.56 |
| 3 | | | 3.199 | | 743958 | VV | ? | 21.88 |
| 4 | | | 3.470 | | 498294 | VV | ? | 29.31 |
| 5 | BROMOMET | 0.087519U | 3.898 | -0.032 | 5713039 | VV | | 20.00 |
| 6 | | | 4.355 | | 962101 | VV | ? | 12.50 |
| 7 | VIC/F2CL2 | 0.103521U | 4.810 | -0.020 | 9659916 | VV | | 18.31 |
| 8 | | | 5.474 | | 1126481 | VV | ? | 27.50 |
| 9 | CLOROET | 0.032093U | 5.970 | -0.020 | 15579580 | VV | | 18.13 |
| 10 | | | 7.015 | | 2168279 | VV | | 16.44 |
| 11 | | | 7.344 | | 238664 | VV | ? | 16.00 |
| 12 | MECL2 | 0.053566U | 8.095 | -0.025 | 9334318 | VV | | 13.50 |
| 13 | | | 8.719 | | 440351 | VB | ? | 11.50 |
| 14 | | | 9.442 | | 176380 | BV | | 8.00 |
| 15 | | | 10.253 | | 115136 | VV | | 7.31 |
| 16 | CL2F/11DC | 0.114835U | 10.752 | -0.018 | 8708131 | VV | | 13.63 |
| 17 | | | 11.124 | | 10034038 | VV | | 13.56 |
| 18 | 1,1DCA | 0.032359U | 11.965 | -0.025 | 15446681 | VV | | 13.00 |
| 19 | T1,2DCE | 0.035838U | 12.654 | -0.026 | 13951691 | VV | | 13.31 |
| 20 | CHCL3 | 0.018461U | 13.134 | -0.016 | 27084236 | VV | | 14.50 |
| 21 | 1,2DCANE | 0.023147U | 13.889 | -0.021 | 21601340 | VV | | 14.88 |
| 22 | | | 14.780 | | 739027 | VV | ? | 17.13 |
| 23 | 111TCANE | 0.030814U | 15.205 | -0.015 | 16226393 | VV | | 14.81 |
| 24 | CCL4 | 0.027202U | 15.595 | -0.015 | 18381030 | VV | | 14.44 |
| 25 | CL2BR | 0.025793U | 16.000 | -0.020 | 19385158 | VV | | 17.56 |
| 26 | | | 16.606 | | 997365 | VV | ? | 11.44 |
| 27 | | | 16.893 | | 582630 | VV | ? | 13.88 |
| 28 | DCA/DCE | 0.026633U | 17.499 | 0.019 | 37547632 | VV | | 30.56 |
| 29 | TCE | 0.016217U | 18.171 | -0.039 | 30831932 | VV | | 16.69 |
| 30 | TCA/DCP/C | 0.023861U | 18.896 | -0.034 | 62863352 | VV | | 17.31 |
| 31 | CHBR2CL | 0.025384U | 20.155 | -0.055 | 19697088 | VV | | 19.38 |
| 32 | | | 20.942 | | 402948 | VV | ? | 12.63 |
| 33 | | | 21.205 | | 273408 | VV | ? | 12.25 |
| 34 | CHBR3 | 0.111984U | 21.563 | -0.047 | 4464927 | VB | | 19.06 |
| 35 | CL4ENE/AN | 0.012476U | 23.914 | -0.056 | 80151934 | BV | | 15.88 |
| 36 | | | 25.757 | | 87160 | T | | 7.44 |
| 37 | | | 26.147 | | 235562 | T | | 5.94 |
| 38 | CLBZ | 0.048157U | 26.689 | -0.061 | 10382813 | VV | | 18.06 |
| 39 | | | 29.116 | | 212698 | BB | | 5.88 |
| TOTALS: | | | | -0.547 | 452786720 | | | |

DETECTED PKS: 42  REJECTED PKS: 3

AMT STD: 1.00000

NOISE: 880.0  OFFSET: 1601

NOTES:
NOTEBOOK: 233-140 ANALYST: K.JUREK
SECURE AREA: E JOB#:U-4081
INST:VARIAN 6000#4 HALL 10X1 ATTN:128
COLUMN:8'SS 1/8"OD CARBOPACK B

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 13 | | | 8.719 | | 440351 | VB | ? | 11.50 |
| 14 | | | 9.442 | | 176380 | BV | | 8.00 |
| 15 | | | 10.253 | | 115136 | VV | | 7.31 |
| 16 | CL2F/11DC | 0.114835U | 10.752 | -0.018 | 8708131 | VV | | 13.63 |
| 17 | | | 11.124 | | 10034038 | VV | | 13.56 |
| 18 | 1,1DCA | 0.032369U | 11.965 | -0.025 | 15446681 | VV | | 15.00 |
| 19 | T1,2DCE | 0.035838U | 12.654 | -0.026 | 13951691 | VV | | 13.31 |
| 20 | CHCL3 | 0.018461U | 13.134 | -0.016 | 27084236 | VV | | 14.50 |
| 21 | 1,2DCANE | 0.023147U | 13.889 | -0.021 | 21601340 | VV | | 14.88 |
| 22 | | | 14.780 | | 739027 | VV | ? | 17.13 |
| 23 | 111TCANE | 0.030814U | 15.205 | -0.015 | 16226393 | VV | | 14.81 |
| 24 | CCL4 | 0.027202U | 15.595 | -0.015 | 18381030 | VV | | 14.44 |
| 25 | CL2BR | 0.025793U | 16.000 | -0.020 | 19385158 | VV | | 17.56 |
| 26 | | | 16.606 | | 997365 | VV | ? | 11.44 |
| 27 | | | 16.893 | | 582530 | VV | ? | 13.88 |
| 28 | DCA/DCE | 0.026633U | 17.499 | 0.019 | 37547632 | VV | | 30.50 |
| 29 | TCE | 0.016217U | 18.171 | -0.039 | 30831932 | VV | | 16.69 |
| 30 | TCA/DCP/C | 0.023861U | 18.896 | -0.034 | 62863352 | VV | | 17.31 |
| 31 | CHBR2CL | 0.025384U | 20.155 | -0.055 | 19697088 | VV | | 19.38 |
| 32 | | | 20.942 | | 402948 | VV | ? | 12.63 |
| 33 | | | 21.205 | | 273408 | VV | ? | 12.25 |
| 34 | CHBR3 | 0.111984U | 21.563 | -0.047 | 4464927 | VB | | 19.06 |
| 35 | CL4ENE/AN | 0.012476U | 23.914 | -0.056 | 80151934 | BV | | 15.88 |
| 36 | | | 25.757 | | 87160 | T | | 7.44 |
| 37 | | | 26.147 | | 235562 | T | | 5.94 |
| 38 | CLBZ | 0.048157U | 26.689 | -0.061 | 10382813 | VV | | 18.06 |
| 39 | | | 29.116 | | 212698 | BB | | 5.88 |

TOTALS: -0.547 452786720

DETECTED PKS: 42 REJECTED PKS: 3

AMT STD: 1.00000

NOISE: 880.0 OFFSET: 1601

NOTES:
NOTEBOOK: 233-140 ANALYST: K.JUREK
SECURE AREA: E JOB#:U-4081
INST:VARIAN 6000#4 HALL 10X1 ATTN:128
COLUMN:8'SS 1/8"OD CARBOPACK B
LIQUID PHASE:1%SP-1000
CARRIER GAS N2@40ML/MIN
DET:950C INJ:220C
OVEN TEMP:45C/3MIN 8C/MIN 220C
5ML P&T

POST RUN:
SAVE FILE: RAW HAL0863

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A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent _____ Analytical Method 625/8270

Instrument HP - MSD _____

COLUMN

Type Capillary

Length 30m

Diameter 0.32mm

Liquid Phase (% wt.) DB-5

Support fused silica

Mesh NA

CARRIER GAS He

Rotameter NA

Inlet Pressure, psig 50

Flow Rate, mL/min. 0.5-0.75

DETECTOR Mass Spec

Mass Range 35-500

Attenuation _____

238082

QUANT REPORT

Operator ID: USER6 Quant Rev: 4 Quant Time: 860829 11:23
Output File: ^B2552::Q2 Injected at: 860829 10:10
Data File: >B2552::D4 Dilution Factor: 1.00
Name: B/N STD 50 NGS
Misc: 8/29/86MDS 1 UL INJ

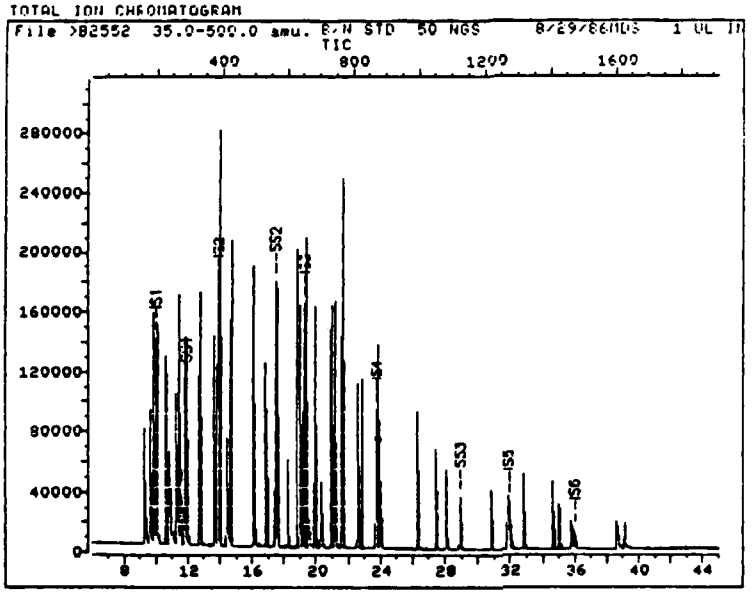
ID File: BNBI4::D2
Title: BN ID FILE FOR THE MSD (INITIAL CAL.)
Last Calibration: 860731 15:45

| | Compound | | R.T. | Scan# | Area | Conc | Units | q |
|---|---|---|---|---|---|---|---|---|
| 1) | *1,4-DICHLOROBENZENE-D4(IS) | | 152 | 9.98 | 195 | 56599 | 40.00 | UG/L | 86 |
| 2) | ANILINE | | 93 | 9.27 | 160 | 86546 | 40.15 | UG/L | 82 |
| 2) | ANILINE | | 93 | 9.63 | 178 | 77080 | 35.76 | UG/L | 15 |
| 3) | BIS(-2-CHLOROETHYL)ETHER | | 93 | 9.63 | 178 | 77080 | 43.93 | UG/L | 81 |
| 4) | 1,3-DICHLOROBENZENE | | 146 | 9.84 | 188 | 98540 | 50.36 | UG/L | 99 |
| 4) | 1,3-DICHLOROBENZENE | | 146 | 10.02 | 197 | 99987 | 51.10 | UG/L | 97 |
| 5) | 1,4-DICHLOROBENZENE | | 146 | 9.84 | 188 | 98540 | 50.92 | UG/L | 98 |
| 5) | 1,4-DICHLOROBENZENE | | 146 | 10.02 | 197 | 99987 | 51.66 | UG/L | 94 |
| 6) | BENZYL ALCOHOL | | 79 | 10.83 | 237 | 70526 | 46.17 | UG/L | 92 |
| 7) | 1,2-DICHLOROBENZENE | | 146 | 10.57 | 224 | 97620 | 48.31 | UG/L | 95 |
| 8) | BIS(2-CHLOROISOPROPYL)ETHER | | 45 | 11.30 | 260 | 177271 | 42.18 | UG/L | 100 |
| 9) | N-NITROSO-DI-N-PROPYLAMINE | | 70 | 11.75 | 282 | 75730 | 41.42 | UG/L | 97 |
| 9) | N-NITROSO-DI-N-PROPYLAMINE | | 70 | 11.87 | 288 | 15722 | 8.60 | UG/L | 86 |
| 10) | HEXACHLOROETHANE | | 117 | 11.46 | 268 | 46829 | 46.67 | UG/L | 92 |
| 11) | *NAPHTHALENE-D8 | (IS) | 136 | 13.88 | 387 | 195418 | 40.00 | UG/L | 100 |
| 12) | NITROBENZENE-D5 | (SURR) | 82 | 11.87 | 288 | 91481 | 46.71 | UG/L | 96 |
| 13) | NITROBENZENE | | 77 | 11.93 | 291 | 96573 | 47.12 | UG/L | 95 |
| 14) | ISOPHORONE | | 82 | 12.70 | 329 | 184428 | 46.61 | UG/L | 94 |
| 15) | BIS(-2-CHLOROETHOXY)METHANE | | 93 | 13.66 | 376 | 108144 | 48.57 | UG/L | 97 |
| 16) | 1,2,4-TRICHLOROBENZENE | | 180 | 13.84 | 385 | 93061 | 50.32 | UG/L | 99 |
| 17) | NAPHTHALENE | | 128 | 13.94 | 390 | 253998 | 52.80 | UG/L | 100 |
| 17) | NAPHTHALENE | | 128 | 13.98 | 392 | 1871 | .39 | UG/L | 100 |
| 17) | NAPHTHALENE | | 128 | 14.43 | 414 | 6562 | 1.36 | UG/L | 100 |
| 18) | 4-CHLOROANILINE | | 127 | 13.94 | 390 | 33921 | 17.60 | UG/L | 16 |
| 18) | 4-CHLOROANILINE | | 127 | 14.45 | 415 | 84265 | 43.71 | UG/L | 98 |
| 19) | HEXACHLOROBUTADIENE | | 225 | 14.66 | 425 | 66455 | 52.72 | UG/L | 97 |
| 20) | 2-METHYLNAPHTHALENE | | 142 | 16.08 | 495 | 146839 | 48.20 | UG/L | 96 |
| 20) | 2-METHYLNAPHTHALENE | | 142 | 16.38 | 510 | 3309 | 1.09 | UG/L | 86 |
| 21) | *ACENAPHTHENE-D10 | (IS) | 162 | 19.27 | 652 | 82600 | 40.00 | UG/L | 96 |
| 22) | HEXACHLOROCYCLOPENTADIENE | | 237 | 16.83 | 532 | 55052 | 58.72 | UG/L | 98 |
| 23) | 2-FLUOROBIPHENYL | (SURR) | 172 | 17.42 | 561 | 165695 | 60.30 | UG/L | 95 |
| 24) | 2-CHLORONAPHTHALENE | | 162 | 17.52 | 566 | 142486 | 57.11 | UG/L | 97 |
| 25) | 2-NITROANILINE | | 65 | 18.19 | 599 | 39390 | 43.46 | UG/L | 93 |
| 26) | DIMETHYL PHTHALATE | | 163 | 19.01 | 639 | 156683 | 52.80 | UG/L | 95 |
| 27) | 4-NITROANILINE | | 138 | 19.51 | 664 | 20434 | 38.07 | UG/L | 16 |
| 28) | DIBENZOFURAN | | 168 | 19.86 | 681 | 181158 | 54.32 | UG/L | 100 |
| 28) | DIBENZOFURAN | | 168 | 19.92 | 684 | 1518 | .46 | UG/L | 100 |
| 29) | ACENAPHTHYLENE | | 152 | 18.76 | 627 | 220285 | 59.14 | UG/L | 99 |
| 30) | FLUORENE | | 166 | 20.92 | 733 | 129836 | 52.65 | UG/L | 95 |
| 31) | 3-NITROANILINE | | 138 | 21.55 | 764 | 5758 | 18.04 | UG/L | 69 |
| 32) | ACENAPHTHENE | | 153 | 19.35 | 656 | 147398 | 60.13 | UG/L | 96 |
| 33) | 2,4-DINITROTOLUENE | | 165 | 20.29 | 702 | 28432 | 36.05 | UG/L | 100 |
| 34) | 2,6-DINITROTOLUENE | | 165 | 19.01 | 639 | 1469 | 2.03 | UG/L | 100 |
| 34) | 2,6-DINITROTOLUENE | | 165 | 19.13 | 645 | 32194 | 44.43 | UG/L | 100 |

| | Compound | | R.T. | Scan# | Area | Conc | Units | q |
|---|---|---|---|---|---|---|---|---|
| 36) | 4-CHLOROPHENYL-PHENYLETHER | 204 | 21.12 | 743 | 68049 | 52.70 | UG/L | 89 |
| 37) | *PHENANTHRENE-D10 (IS) | 188 | 23.70 | 870 | 96233 | 40.00 | UG/L | 97 |
| 38) | N-NITROSODIPHENYLAMINE | 169 | 21.12 | 743 | 5133 | 5.02 | UG/L | 80 |
| 38) | N-NITROSODIPHENYLAMINE | 169 | 21.57 | 765 | 43720 | 42.73 | UG/L | 99 |
| 39) | 4-BROMOPHENYL-PHENYL ETHER | 248 | 22.57 | 814 | 37191 | 57.99 | UG/L | 90 |
| 40) | HEXACHLOROBENZENE | 284 | 22.81 | 826 | 46582 | 56.79 | UG/L | 93 |
| 41) | PHENANTHRENE | 178 | 23.76 | 873 | 123977 | 52.71 | UG/L | 99 |
| 41) | PHENANTHRENE | 178 | 23.91 | 880 | 120147 | 51.09 | UG/L | 99 |
| 42) | ANTHRACENE | 178 | 23.76 | 873 | 123977 | 51.20 | UG/L | 99 |
| 42) | ANTHRACENE | 178 | 23.91 | 880 | 120147 | 49.62 | UG/L | 99 |
| 43) | DI-N-BUTYLPHTHALATE | 149 | 26.26 | 996 | 120896 | 44.58 | UG/L | 99 |
| 44) | FLUORANTHENE | 202 | 27.40 | 1052 | 83520 | 42.59 | UG/L | 94 |
| 45) | *CHRYSENE-D12 (IS) | 240 | 31.85 | 1271 | 33646 | 40.00 | UG/L | 100 |
| 47) | PYRENE | 202 | 28.03 | 1083 | 80430 | 59.69 | UG/L | 95 |
| 48) | TERPHENYL-D14 (SURR) | 244 | 28.91 | 1126 | 48907 | 52.36 | UG/L | 100 |
| 49) | BUTYLBENZYLPHTHALATE | 149 | 30.80 | 1219 | 28435 | 50.18 | UG/L | 91 |
| 50) | 3,3'DICHLOROBENZIDINE | 252 | 32.14 | 1285 | 6780 | 25.28 | UG/L | 100 |
| 51) | BENZO(A)ANTHRACENE | 228 | 31.81 | 1269 | 44495 | 47.21 | UG/L | 98 |
| 51) | BENZO(A)ANTHRACENE | 228 | 31.94 | 1275 | 52573 | 55.79 | UG/L | 96 |
| 52) | BIS(2-ETHYLHEXYL)PHTHALATE | 149 | 32.83 | 1319 | 39097 | 51.60 | UG/L | 89 |
| 53) | CHRYSENE | 228 | 31.81 | 1269 | 44495 | 46.95 | UG/L | 97 |
| 53) | CHRYSENE | 228 | 31.94 | 1275 | 52573 | 55.48 | UG/L | 97 |
| 54) | *PERYLENE-D12 (IS) | 264 | 35.94 | 1472 | 26600 | 40.00 | UG/L | 100 |
| 55) | DI-N-OCTYL PHTHALATE | 149 | 34.64 | 1408 | 54549 | 48.06 | UG/L | 100 |
| 56) | BENZO(B)FLUORANTHENE | 252 | 34.94 | 1423 | 40231 | 49.80 | UG/L | 100 |
| 56) | BENZO(B)FLUORANTHENE | 252 | 35.02 | 1427 | 46014 | 56.96 | UG/L | 100 |
| 57) | BENZO(K)FLUORANTHENE | 252 | 34.94 | 1423 | 40231 | 48.90 | UG/L | 100 |
| 57) | BENZO(K)FLUORANTHENE | 252 | 35.02 | 1427 | 46014 | 55.93 | UG/L | 100 |
| 58) | BENZO(A)PYRENE | 252 | 35.78 | 1464 | 36288 | 48.68 | UG/L | 100 |
| 59) | INDENO(1,2,3-CD)PYRENE | 276 | 38.52 | 1599 | 31582 | 45.60 | UG/L | 100 |
| 60) | DIBENZ(A,H)ANTHRACENE | 278 | 38.64 | 1605 | 35264 | 49.67 | UG/L | 100 |
| 60) | DIBENZ(A,H)ANTHRACENE | 278 | 39.05 | 1625 | 1513 | 2.13 | UG/L | 100 |
| 61) | BENZO(G,H,I)PERYLENE | 276 | 39.07 | 1626 | 41134 | 53.39 | UG/L | 64 |

* Compound is ISTD

TOTAL ION CHROMATOGRAM




Data File: >B2552::D4
Name: B/N STD 50 NGS
Misc: 8/29/86MDS 1 UL INJ

Id File: BNBI4::D2
Title: BN ID FILE FOR THE MSD (INITIAL CAL.)
Last Calibration: 860731 15:45

Operator ID: USER6
Quant Time: 860829 11:23
Injected at: 860829 10:10

QUANT REPORT

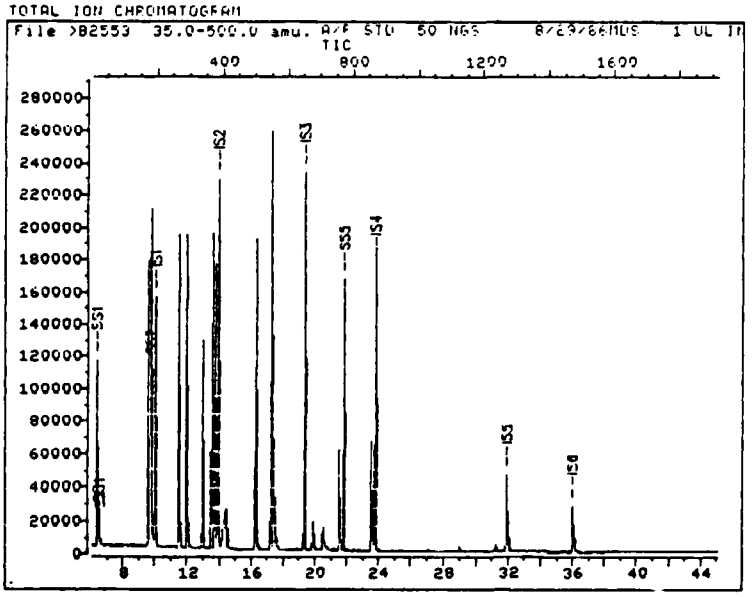
Operator ID: USER6 Quant Rev: 4 Quant Time: 860829 11:49
Output File: ^B2553::Q2 Injected at: 860829 11:02
Data File: >B2553::D4 Dilution Factor: 1.00
Name: A/P STD 50 NGS
Misc: 8/29/86MDS 1 UL INJ

ID File: APB14::D2
Title: BNA ID FILE FOR THE MSD (INITIAL CAL.)
Last Calibration: 860731 17:03

| | Compound | | R.T. | Scan# | Area | Conc | Units | q |
|---|---|---|---|---|---|---|---|---|
| 1) | *1,4-DICHLOROBENZENE-D4 | (IS) | 152 | 10.00 | 194 | 68445 | 40.00 UG/L | 86 |
| 2) | PHENOL-D5 | (SURR) | 99 | 9.73 | 181 | 129195 | 54.75 UG/L | 96 |
| 4) | 2-FLUOROPHENOL | (SURR) | 112 | 6.35 | 15 | 76427 | 51.39 UG/L | 97 |
| 4) | 2-FLUOROPHENOL | (SURR) | 112 | 6.48 | 21 | 5596 | 3.76 UG/L | 87 |
| 4) | 2-FLUOROPHENOL | (SURR) | 112 | 6.54 | 24 | 2277 | 1.53 UG/L | 59 |
| 5) | PHENOL | | 94 | 9.79 | 184 | 117087 | 53.57 UG/L | 60 |
| 6) | 2-METHYL PHENOL | | 108 | 11.48 | 267 | 93979 | 51.71 UG/L | 97 |
| 7) | 2-CHLOROPHENOL | | 128 | 9.55 | 172 | 110047 | 54.86 UG/L | 96 |
| 8) | 4-METHYL PHENOL | | 108 | 11.48 | 267 | 93979 | 51.38 UG/L | 73 |
| 8) | 4-METHYL PHENOL | | 108 | 11.99 | 292 | 95819 | 52.39 UG/L | 92 |
| 9) | *NAPHTHALENE-D8 | (IS) | 136 | 13.90 | 386 | 264444 | 40.00 UG/L | 100 |
| 10) | 2-NITROPHENOL | | 139 | 12.93 | 338 | 67659 | 52.94 UG/L | 92 |
| 11) | 2,4-DIMETHYLPHENOL | | 122 | 13.50 | 366 | 95457 | 51.75 UG/L | 91 |
| 12) | BENZOIC ACID | | 105 | 14.45 | 413 | 64161 | 40.57 UG/L | 94 |
| 13) | 2,4-DICHLOROPHENOL | | 162 | 13.74 | 378 | 85952 | 43.03 UG/L | 96 |
| 14) | 4-CHLORO-3-METHYLPHENOL | | 107 | 16.24 | 501 | 105102 | 48.03 UG/L | 97 |
| 15) | *ACENAPHTHENE-D10 | (IS) | 162 | 19.29 | 651 | 129459 | 40.00 UG/L | 98 |
| 16) | 2,4,6-TRICHLOROPHENOL | | 196 | 17.24 | 550 | 85057 | 59.03 UG/L | 95 |
| 16) | 2,4,6-TRICHLOROPHENOL | | 196 | 17.34 | 555 | 90877 | 63.07 UG/L | 98 |
| 17) | 2,4,5-TRICHLOROPHENOL | | 196 | 17.24 | 550 | 85057 | 50.55 UG/L | 97 |
| 17) | 2,4,5-TRICHLOROPHENOL | | 196 | 17.34 | 555 | 90877 | 54.01 UG/L | 99 |
| 18) | 2,4,6-TRIBROMOPHENOL | (SURR) | 330 | 21.77 | 723 | 56081 | 52.79 UG/L | 95 |
| 19) | 2,4-DINITROPHENOL | | 184 | 19.84 | 678 | 17532 | 33.46 UG/L | 100 |
| 20) | 4-NITROPHENOL | | 139 | 20.47 | 709 | 19963 | 38.00 UG/L | 100 |
| 20) | 4-NITROPHENOL | | 139 | 20.84 | 727 | 884 | 1.68 UG/L | 100 |
| 21) | *PHENANTHRENE-D10 | (IS) | 188 | 23.72 | 869 | 214524 | 40.00 UG/L | 93 |
| 22) | 4,6-DINITRO-2-METHYLPHENOL | | 198 | 21.49 | 759 | 31206 | 40.94 UG/L | 100 |
| 23) | PENTACHLOROPHENOL | | 266 | 23.54 | 860 | 41217 | 44.83 UG/L | 100 |
| 24) | *CHRYSENE-D12 | (IS) | 240 | 31.89 | 1271 | 81832 | 40.00 UG/L | 75 |
| 25) | *PERYLENE-D12 | (IS) | 264 | 35.96 | 1471 | 69008 | 40.00 UG/L | 100 |

* Compound is ISTD

TOTAL ION CHROMATOGRAM




Data File: >82553::D4
Name: A/P STD 50 NGS
Misc: 8/29/86MDS 1 UL INJ

Id File: APBI4::D2
Title: BNA ID FILE FOR THE MSD (INITIAL CAL.)
Last Calibration: 860731 17:03

Operator ID: USER6
Quant Time: 860829 11:49
Injected at: 860829 11:02

ecology and environment, inc.

A N A L Y T I C A L  S E R V I C E S  C E N T E R

CHROMATOGRAPHIC CONDITIONS

Operator _____ Date _____

Job Number _____ Sample Identification _____

Solvent _____ Analytical Method 625/8270

Instrument HP - MSD Phenol Confirmation

COLUMN

Type Capillary

Length 30m

Diameter 0.32mm

Liquid Phase (% wt.) DB-5

Support fused silica

Mesh NA

CARRIER GAS He

Rotameter NA

Inlet Pressure, psig 50

Flow Rate, mL/min. 0.5-0.75

SPLIT _____

HALL DETECTOR

Mode _____

Solvent _____

Solvent flow, ml/min. _____

Reactor tube temperature, °C _____

Reactor gas _____

Reactor gas flow, ml/min. _____

FID GAS

Hydrogen, ml/min. _____

Air, ml/min. _____

CHART SPEED, cm/min. _____

DETECTOR Mass Spec

Range 35-500

Attenuation _____

TEMPERATURE, °C

Detector _____

Injection Port _____

Column

Initial _____

Program _____

Final _____

PURGE AND TRAP

Purge time _____ Temp. _____

Purge flow _____

Desorb time _____ Temp. _____

Bake time _____ Temp. _____

238082

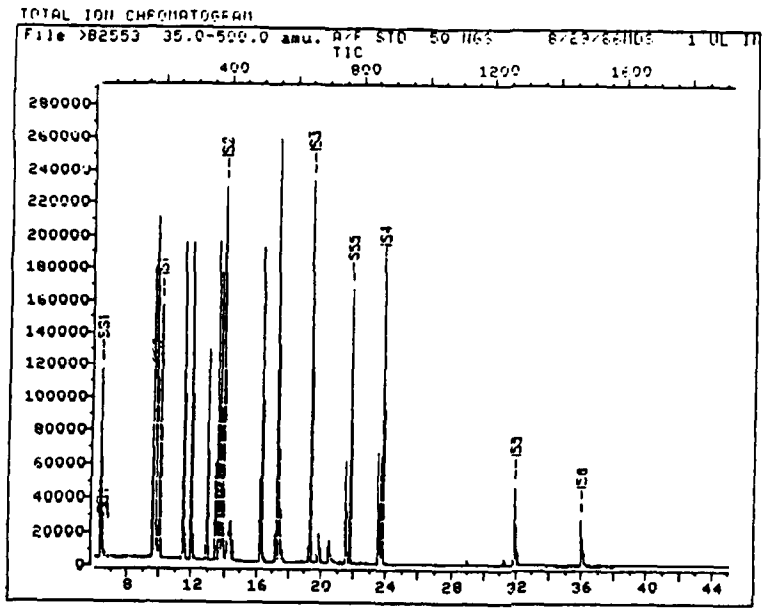
QUANT REPORT

Operator ID: USER6 Quant Rev: 4 Quant Time: 860829 11:49
Output File: ^B2553::Q2 Injected at: 860829 11:02
Data File: >B2553::D4 Dilution Factor: 1.00
Name: A/P STD 50 NGS
Misc: 8/29/86MDS 1 UL INJ

ID File: APB14::D2
Title: BNA ID FILE FOR THE MSD (INITIAL CAL.)
Last Calibration: 860731 17:03

| | Compound | | R.T. | Scan# | Area | Conc | Units | q |
|---|---|---|---|---|---|---|---|---|
| 1) | *1,4-DICHLOROBENZENE-D4 | (IS) | 152 | 10.00 | 194 | 68445 | 40.00 UG/L | 86 |
| 2) | PHENOL-D5 | (SURR) | 99 | 9.73 | 181 | 129195 | 54.75 UG/L | 96 |
| 4) | 2-FLUOROPHENOL | (SURR) | 112 | 6.35 | 15 | 76427 | 51.39 UG/L | 97 |
| 4) | 2-FLUOROPHENOL | (SURR) | 112 | 6.48 | 21 | 5596 | 3.76 UG/L | 87 |
| 4) | 2-FLUOROPHENOL | (SURR) | 112 | 6.54 | 24 | 2277 | 1.53 UG/L | 5? |
| 5) | PHENOL | | 94 | 9.79 | 184 | 117087 | 53.57 UG/L | 60 |
| 6) | 2-METHYL PHENOL | | 108 | 11.48 | 267 | 93979 | 51.71 UG/L | 97 |
| 7) | 2-CHLOROPHENOL | | 128 | 9.55 | 172 | 110047 | 54.86 UG/L | 96 |
| 8) | 4-METHYL PHENOL | | 108 | 11.48 | 267 | 93979 | 51.38 UG/L | 73 |
| 8) | 4-METHYL PHENOL | | 108 | 11.99 | 292 | 95819 | 52.39 UG/L | 92 |
| 9) | *NAPHTHALENE-D8 | (IS) | 136 | 13.90 | 386 | 264444 | 40.00 UG/L | 100 |
| 0) | 2-NITROPHENOL | | 139 | 12.93 | 338 | 67659 | 52.94 UG/L | 92 |
| 1) | 2,4-DIMETHYLPHENOL | | 122 | 13.50 | 366 | 95457 | 51.75 UG/L | 91 |
| 2) | BENZOIC ACID | | 105 | 14.45 | 413 | 64161 | 40.57 UG/L | 94 |
| 3) | 2,4-DICHLOROPHENOL | | 162 | 13.74 | 378 | 85952 | 43.03 UG/L | 96 |
| 4) | 4-CHLORO-3-METHYLPHENOL | | 107 | 16.24 | 501 | 105102 | 48.03 UG/L | 97 |
| 5) | *ACENAPHTHENE-D10 | (IS) | 162 | 19.29 | 651 | 129459 | 40.00 UG/L | 98 |
| 6) | 2,4,6-TRICHLOROPHENOL | | 196 | 17.24 | 550 | 85057 | 59.03 UG/L | 95 |
| 6) | 2,4,6-TRICHLOROPHENOL | | 196 | 17.34 | 555 | 90877 | 63.07 UG/L | 98 |
| 7) | 2,4,5-TRICHLOROPHENOL | | 196 | 17.24 | 550 | 85057 | 50.55 UG/L | 97 |
| 7) | 2,4,5-TRICHLOROPHENOL | | 196 | 17.34 | 555 | 90877 | 54.01 UG/L | 99 |
| 8) | 2,4,6-TRIBROMOPHENOL | (SURR) | 330 | 21.77 | 723 | 56081 | 52.79 UG/L | 95 |
| 9) | 2,4-DINITROPHENOL | | 184 | 19.84 | 678 | 17532 | 33.46 UG/L | 100 |
| 0) | 4-NITROPHENOL | | 139 | 20.47 | 709 | 19963 | 38.00 UG/L | 100 |
| 0) | 4-NITROPHENOL | | 139 | 20.84 | 727 | 884 | 1.68 UG/L | 100 |
| 1) | *PHENANTHRENE-D10 | (IS) | 188 | 23.72 | 869 | 214524 | 40.00 UG/L | 93 |
| 2) | 4,6-DINITRO-2-METHYLPHENOL | | 198 | 21.49 | 759 | 31206 | 40.94 UG/L | 100 |
| 3) | PENTACHLOROPHENOL | | 266 | 23.54 | 860 | 41217 | 44.83 UG/L | 100 |
| 4) | *CHRYSENE-D12 | (IS) | 240 | 31.89 | 1271 | 81832 | 40.00 UG/L | 75 |
| 5) | *PERYLENE-D12 | (IS) | 264 | 35.96 | 1471 | 69008 | 40.00 UG/L | 100 |

* Compound is ISTD




Data File: >82553::D4
Name: A/P STD 50 NGS
Misc: 8/29/86MDS 1 UL INJ

Id File: APB14::D2
Title: BNA ID FILE FOR THE MSD (INITIAL CAL.)
Last Calibration: 860731 17:03

Operator ID: USER6
Quant Time: 860829 11:49
Injected at: 860829 11:02

Ecology and Environment, Inc.

# CHROMATOGRAPHIC CONDITIONS

Operator _____

Job Number _____

Solvent _____

Instrument Varian 6000 #1

Date October 7, 1986

Sample Identification _____

Analytical Method EPA-602

_____

## COLUMN

Type Stainless Steel

Length 8 ft.

Diameter 1/8 inch

Liquid Phase (% wt.) % SP1000

Support Carbopack B

Mesh 60/80

CARRIER GAS Nitrogen

Rotameter NA

Inlet Pressure, psig 60

Flow Rate, ml/min. 40

## FID GAS

Hydrogen, ml/min. 30

Air, ml/min. 300

CHART SPEED, cm/min. 0.5

DETECTOR PID

Range $10^{-11}$

Attenuation 8

## TEMPERATURE, °C

Detector 300

Injection Port 220

Column

Initial 45 3 minutes

Program 10/min.

Final 220

## PURGE AND TRAP

Purge time 11 min. Temp. 30°C

Purge flow 40 ml/min.

Desorb time 4 min. Temp. 180°C

Bake time 15 min. Temp. 200 °C

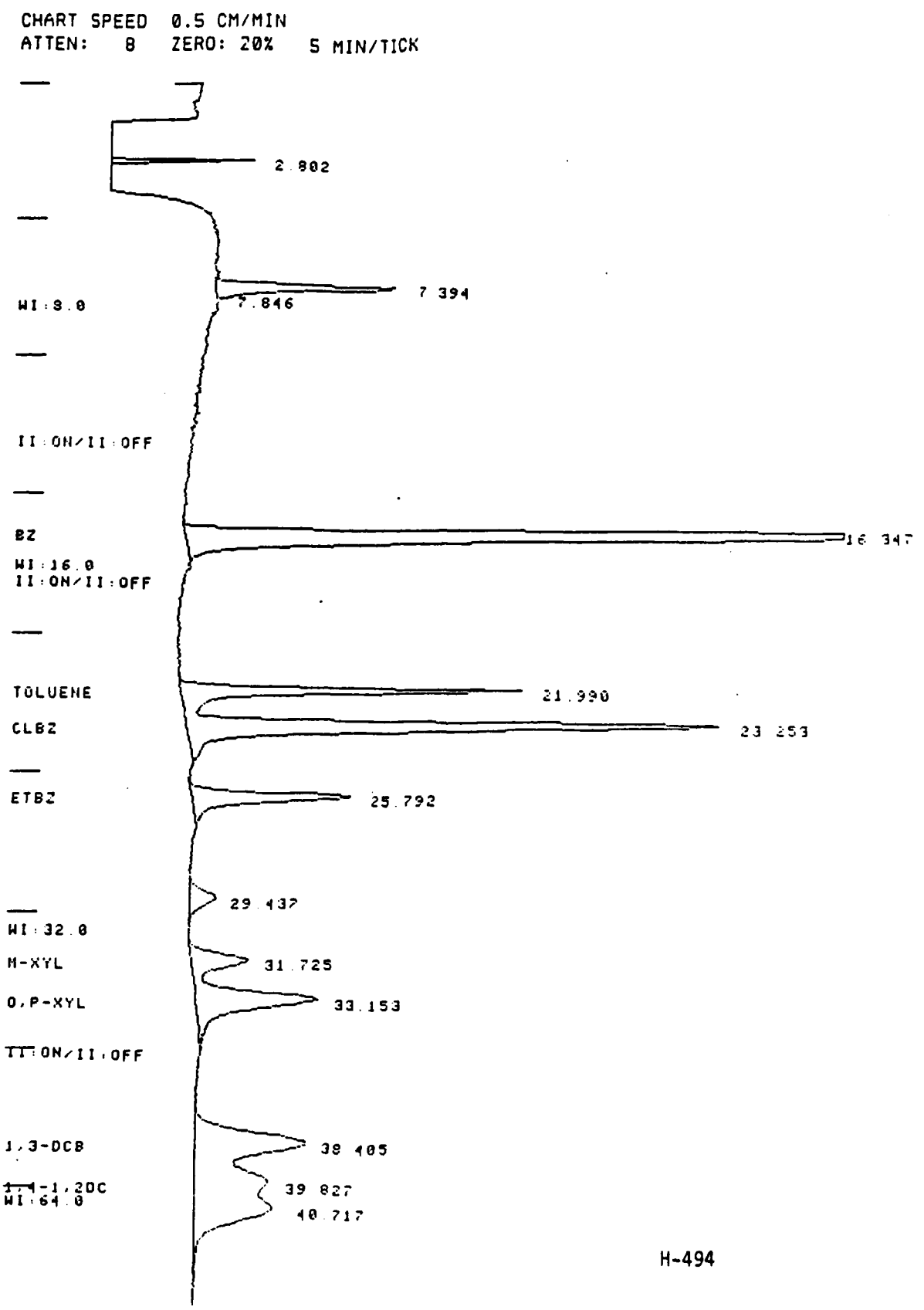
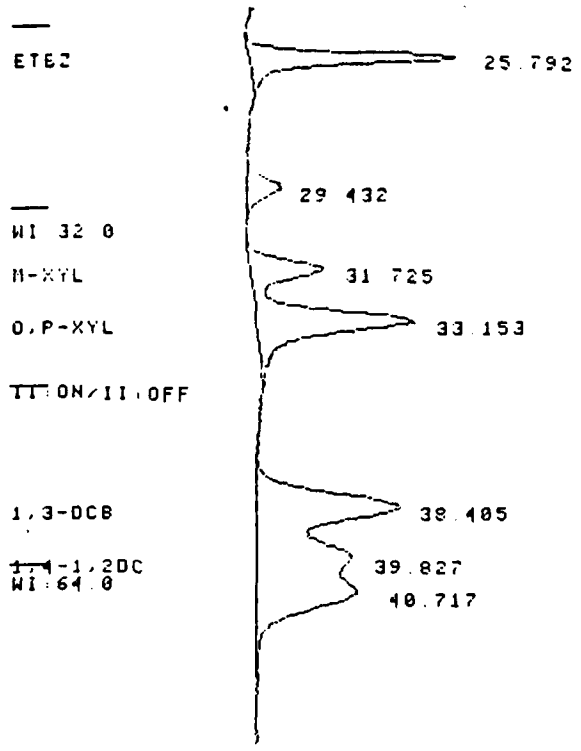


CHART SPEED 0.5 CM/MIN
ATTEN: 8 ZERO: 20% 5 MIN/TICK
2.802
7.394
7.846
WI:8.0
II:ON/II:OFF
BZ
16.347
WI:16.0
II:ON/II:OFF
TOLUENE
21.990
CLBZ
23.253
ETBZ
25.792
29.437
WI:32.0
M-XYL
31.725
O,P-XYL
33.153
II:ON/II:OFF
1,3-DCB
38.405
1,4-1,2DC
39.827
WI:64.0
40.717




RECALCULATE ON FILE: FY1139 /

CHANNEL: 2B - 1  TITLE: RUN#  19:45  25 SEP 86

SAMPLE: 2-158-82  METHOD: AROCONF  CALCULATION: ES - CALIB

| PEAK NO | PEAK NAME | RESULT FACTOR | TIME (MIN) | TIME OFFSET | AREA COUNTS | SEP CODE | WI/2 (SEC) |
|---|---|---|---|---|---|---|---|
| 1 | BZ | 0.195024U | 16.347 | -0.003 | 2563789 | BB | 18.13 |
| 2 | TOLUENE | 0.769792U | 21.990 | 0.000 | 649526 | BV | 14.13 |
| 3 | CLBZ | 0.386111U | 23.253 | 0.003 | 1294963 | VB | 19.31 |
| 4 | ETBZ | 1.195312U | 25.792 | 0.002 | 418301 | BB | 21.25 |
| 5 | | | 29.432 | | 110441 | BB | ? 36.88 |
| 6 | M-XYL | 2.231017U | 31.725 | -0.005 | 224113 | BV | 34.56 |
| 7 | O,P-XYL | 1.713740U | 33.153 | 0.003 | 583519 | VB | 39.50 |
| 8 | 1,3-DCB | 0.749118U | 38.405 | -0.005 | 667452 | BV | 53.31 |
| 9 | 1,4-1,2DC | 2.262996U | 39.827 | -0.003 | 441892 | VV | ? 68.81 |
| 10 | | | 40.717 | | 537510 | VB | ? 83.38 |
| TOTALS: | | | | -0.008 | 7491506 | | |

DETECTED PKS: 13  REJECTED PKS: 3

AMT STD: 1.00000

NOISE: 125.7  OFFSET: -625

NOTES:
NOTEBOOK:228-93 ANALYST:RICHARD SAMSON
SECURE AREA: E JOB#U-4164
INST:VARIAN 6000#1 PID 10X1 ATTN:8
COLUMN:8'SS 1/8" OD

# APPENDIX I

## GEOPHYSICAL DATA

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data

| X | Y | MAG | EM |
|---|---|---|---|
| 0, | 0, | 52164 | 0.42 |
| 0, | 25, | 53021 | 0.39 |
| 0, | 50, | 51560 | 0.28 |
| 0, | 75, | 51800 | 0.34 |
| 0, | 100, | 51873 | 0.35 |
| 0, | 125, | 51932 | 0.32 |
| 0, | 150, | 52039 | 0.32 |
| 0, | 175, | 52335 | 0.33 |
| 0, | 200, | 52377 | 0.44 |
| 0, | 225, | 51714 | 0.49 |
| 0, | 250, | 52068 | 0.46 |
| 0, | 275, | 52006 | 0.55 |
| 0, | 300, | 51257 | 0.40 |
| 0, | 325, | 51654 | 0.30 |
| 0, | 350, | 51810 | 0.28 |
| 0, | 375, | 51867 | 0.32 |
| 0, | 400, | 51880 | 0.32 |
| 50, | 400, | 51841 | 0.29 |
| 50, | 375, | 51787 | 0.25 |
| 50, | 350, | 51664 | 0.30 |
| 50, | 325, | 51776 | 0.35 |
| 50, | 300, | 51829 | 0.39 |
| 50, | 275, | 51674 | 0.44 |
| 50, | 250, | 51294 | 0.60 |
| 50, | 225, | 54938 | 0.41 |
| 50, | 200, | 52001 | 0.30 |
| 50, | 175, | 51618 | 0.32 |
| 50, | 150, | 51733 | 0.39 |
| 50, | 125, | 51671 | 0.38 |
| 50, | 100, | 51410 | 0.43 |
| 50, | 75, | 51178 | 0.50 |
| 50, | 50, | 52265 | 0.38 |
| 50, | 25, | 52219 | 0.33 |
| 50, | 0, | 51966 | 0.39 |
| 100, | 0, | 51945 | 0.43 |
| 100, | 25, | 52214 | 0.46 |
| 100, | 50, | 52046 | 0.37 |
| 100, | 75, | 53399 | 0.42 |
| 100, | 100, | 52087 | 0.61 |
| 100, | 125, | 51166 | 0.53 |
| 100, | 150, | 51554 | 0.44 |
| 100, | 175, | 52419 | 0.48 |
| 100, | 200, | 51548 | 0.46 |
| 100, | 225, | 50932 | 0.37 |
| 100, | 250, | 51597 | 0.34 |
| 100, | 275, | 51781 | 0.34 |
| 100, | 300, | 52171 | 0.33 |
| 100, | 325, | 51654 | 0.32 |
| 100, | 350, | 51715 | 0.36 |
| 100, | 400, | 51601 | 0.3 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 100, | 425, | 51603 | 0.29 |
| 100, | 450, | 51737 | 0.28 |
| 100, | 475, | 51828 | 0.33 |
| 150, | 500, | 51826 | 0.37 |
| 150, | 475, | 51745 | 0.33 |
| 150, | 450, | 51568 | 0.28 |
| 150, | 425, | 51372 | 0.32 |
| 150, | 400, | 52342 | 0.39 |
| 150, | 375, | 52201 | 0.33 |
| 150, | 350, | 51178 | 0.34 |
| 150, | 325, | 51240 | 0.37 |
| 150, | 300, | 51200 | 0.44 |
| 150, | 275, | 50464 | 0.47 |
| 150, | 250, | 51778 | 0.66 |
| 150, | 225, | 52950 | 0.54 |
| 150, | 200, | 52345 | 0.46 |
| 150, | 175, | 51945 | 0.50 |
| 150, | 150, | 52548 | 0.46 |
| 150, | 125, | 52495 | 0.38 |
| 150, | 100, | 52249 | 0.34 |
| 150, | 75, | 51984 | 0.43 |
| 150, | 50, | 52377 | 0.35 |
| 150, | 25, | 52357 | 0.54 |
| 150, | 0, | 52018 | 0.44 |
| 200, | 0, | 52350 | 0.45 |
| 200, | 25, | 52644 | 0.46 |
| 200, | 50, | 51525 | 0.39 |
| 200, | 100, | 51901 | 0.34 |
| 200, | 125, | 51761 | 0.37 |
| 200, | 150, | 52015 | 0.34 |
| 200, | 175, | 52171 | 0.31 |
| 200, | 200, | 52861 | 0.40 |
| 200, | 225, | 52862 | 0.60 |
| 200, | 250, | 51819 | 0.80 |
| 200, | 275, | 51667 | 0.51 |
| 200, | 300, | 53239 | 0.43 |
| 200, | 325, | 51806 | 0.55 |
| 200, | 350, | 50680 | 0.47 |
| 200, | 375, | 51379 | 0.34 |
| 200, | 400, | 51846 | 0.38 |
| 200, | 425, | 51650 | 0.37 |
| 200, | 450, | 52347 | 0.43 |
| 200, | 475, | 51099 | 0.47 |
| 200, | 500, | 51150 | 0.46 |
| 200, | 525, | 51624 | 0.40 |
| 200, | 550, | 51783 | 0.41 |
| 250, | 600, | 51849 | 0.43 |
| 250, | 575, | 51768 | 0.39 |
| 250, | 550, | 51707 | 0.41 |
| 250, | 525, | 51371 | 0.42 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 250, | 500, | 51119 | 0.54 |
| 250, | 475, | 52123 | 0.56 |
| 250, | 450, | 52316 | 0.43 |
| 250, | 425, | 51742 | 0.33 |
| 250, | 400, | 51313 | 0.32 |
| 250, | 375, | 51163 | 0.36 |
| 250, | 350, | 51824 | 0.43 |
| 250, | 325, | 52278 | 0.44 |
| 250, | 300, | 50846 | 0.43 |
| 250, | 275, | 50704 | 0.54 |
| 250, | 250, | 53548 | 0.33 |
| 250, | 225, | 53164 | 0.40 |
| 250, | 200, | 52380 | 0.31 |
| 250, | 175, | 52122 | 0.31 |
| 250, | 150, | 52004 | 0.33 |
| 250, | 125, | 51961 | 0.36 |
| 250, | 100, | 51932 | 0.28 |
| 250, | 75, | 51910 | 0.22 |
| 250, | 50, | 51812 | 0.36 |
| 250, | 25, | 52286 | 0.43 |
| 250, | 0, | 51962 | 0.43 |
| 300, | 0, | 51926 | 0.39 |
| 300, | 25, | 51873 | 0.33 |
| 300, | 50, | 51882 | 0.33 |
| 300, | 75, | 51905 | 0.31 |
| 300, | 100, | 51924 | 0.25 |
| 300, | 125, | 51930 | 0.27 |
| 300, | 150, | 51945 | 0.33 |
| 300, | 200, | 51964 | 0.36 |
| 300, | 225, | 52061 | 0.34 |
| 300, | 250, | 52141 | 0.33 |
| 300, | 275, | 52425 | 0.33 |
| 300, | 300, | 53130 | 0.39 |
| 300, | 325, | 52918 | 0.50 |
| 300, | 350, | 51953 | 0.50 |
| 300, | 375, | 51746 | 0.41 |
| 300, | 400, | 52485 | 0.44 |
| 300, | 425, | 52060 | 0.55 |
| 300, | 450, | 50902 | 0.52 |
| 300, | 475, | 51419 | 0.53 |
| 300, | 500, | 51994 | 0.32 |
| 300, | 525, | 52768 | 0.37 |
| 300, | 550, | 51264 | 0.52 |
| 300, | 575, | 51060 | 0.42 |
| 300, | 600, | 51584 | 0.35 |
| 300, | 625, | 51763 | 0.38 |
| 300, | 650, | 51836 | 0.41 |
| 300, | 675, | 51856 | 0.69 |
| 350, | 700, | 51871 | |
| 350, | 675, | 51862 | 0.38 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 350, | 650, | 51799 | 0.30 |
| 350, | 625, | 51691 | 0.30 |
| 350, | 600, | 51345 | 0.33 |
| 350, | 625, | 51691 | 0.30 |
| 350, | 600, | 51345 | 0.33 |
| 350, | 575, | 50980 | 0.47 |
| 350, | 550, | 52386 | 0.54 |
| 350, | 525, | 52171 | 0.40 |
| 350, | 500, | 51164 | 0.39 |
| 350, | 475, | 50693 | 0.50 |
| 350, | 450, | 52335 | 0.56 |
| 350, | 425, | 52830 | 0.50 |
| 350, | 400, | 52168 | 0.50 |
| 350, | 375, | 52243 | 0.55 |
| 350, | 350, | 52835 | 0.46 |
| 350, | 325, | 52384 | 0.36 |
| 350, | 300, | 52100 | 0.33 |
| 350, | 275, | 52024 | 0.30 |
| 350, | 250, | 51987 | 0.30 |
| 350, | 225, | 51970 | 0.29 |
| 350, | 200, | 51932 | 0.32 |
| 350, | 175, | 51905 | 0.31 |
| 350, | 150, | 51917 | 0.26 |
| 350, | 125, | 51925 | 0.23 |
| 350, | 100, | 51897 | 0.25 |
| 350, | 75, | 51904 | 0.26 |
| 350, | 50, | 51913 | 0.35 |
| 350, | 25, | 51825 | 0.34 |
| 350, | 0, | 51893 | 0.42 |
| 400, | 0, | 51960 | 0.40 |
| 400, | 25, | 52179 | 0.33 |
| 400, | 50, | 51823 | 0.55 |
| 400, | 75, | 51860 | 0.37 |
| 400, | 100, | 51930 | 0.31 |
| 400, | 125, | 51913 | 0.25 |
| 400, | 150, | 51914 | 0.27 |
| 400, | 175, | 51898 | 0.30 |
| 400, | 200, | 51926 | 0.33 |
| 400, | 225, | 51920 | 0.36 |
| 400, | 250, | 51905 | 0.37 |
| 400, | 275, | 51933 | 0.33 |
| 400, | 300, | 51934 | 0.31 |
| 400, | 325, | 51948 | 0.33 |
| 400, | 350, | 52054 | 0.36 |
| 400, | 375, | 52438 | 0.36 |
| 400, | 400, | 53089 | 0.42 |
| 400, | 425, | 52167 | 0.52 |
| 400, | 450, | 51583 | 0.41 |
| 400, | 475, | 53094 | 0.46 |
| 400, | 500, | 52337 | 0.59 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 400, | 525, | 50786 | 0.58 |
| 400, | 550, | 51321 | 0.45 |
| 400, | 575, | 53254 | 0.34 |
| 400, | 600, | 51803 | 0.56 |
| 400, | 625, | 51894 | 0.32 |
| 400, | 650, | 51612 | 0.32 |
| 400, | 675, | 51789 | 0.34 |
| 400, | 700, | 51826 | 0.36 |
| 400, | 725, | 51852 | 0.50 |
| 450, | 775, | 51891 | 0.79 |
| 450, | 750, | 51886 | 0.44 |
| 450, | 725, | 51847 | 0.32 |
| 450, | 700, | 51797 | 0.28 |
| 450, | 675, | 51720 | 0.30 |
| 450, | 650, | 51442 | 0.45 |
| 450, | 625, | 52506 | 0.54 |
| 450, | 600, | 51262 | 0.48 |
| 450, | 575, | 50835 | 0.53 |
| 450, | 550, | 52146 | 0.76 |
| 450, | 525, | 53474 | 0.47 |
| 450, | 500, | 51526 | 0.52 |
| 450, | 475, | 53167 | 0.59 |
| 450, | 450, | 53238 | 0.38 |
| 450, | 425, | 52436 | 0.36 |
| 450, | 400, | 52128 | 0.33 |
| 450, | 375, | 51987 | 0.33 |
| 450, | 350, | 51932 | 0.31 |
| 450, | 325, | 51987 | 0.30 |
| 450, | 300, | 51930 | 0.34 |
| 450, | 275, | 51913 | 0.38 |
| 450, | 250, | 51925 | 0.37 |
| 450, | 225, | 51933 | 0.28 |
| 450, | 200, | 51923 | 0.31 |
| 450, | 175, | 51898 | 0.30 |
| 450, | 150, | 51914 | 0.26 |
| 450, | 125, | 51908 | 0.31 |
| 450, | 100, | 51927 | 0.32 |
| 450, | 75, | 51883 | 0.32 |
| 450, | 50, | 51748 | 0.37 |
| 450, | 25, | 52250 | 0.48 |
| 450, | 0, | 51963 | 0.43 |
| 500, | 0, | 51937 | 0.41 |
| 500, | 25, | 51980 | 0.40 |
| 500, | 50, | 51891 | 0.36 |
| 500, | 75, | 51894 | 0.34 |
| 500, | 100, | 51884 | 0.40 |
| 500, | 125, | 51887 | 0.42 |
| 500, | 150, | 51873 | 0.33 |
| 500, | 175, | 51889 | 0.29 |
| 500, | 200, | 51927 | 0.24 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 500, | 225, | 51895 | 0.32 |
| 500, | 250, | 51883 | 0.33 |
| 500, | 250, | 51869 | 0.40 |
| 500, | 275, | 51890 | 0.42 |
| 500, | 275, | 51901 | 0.40 |
| 500, | 300, | 51882 | 0.38 |
| 500, | 325, | 51907 | 0.32 |
| 500, | 350, | 51938 | 0.27 |
| 500, | 375, | 51995 | 0.29 |
| 500, | 400, | 52116 | 0.31 |
| 500, | 425, | 52501 | 0.34 |
| 500, | 450, | 53015 | 0.46 |
| 500, | 475, | 52019 | 0.57 |
| 500, | 500, | 51692 | 0.12 |
| 500, | 525, | 53092 | 0.51 |
| 500, | 550, | 52612 | 0.62 |
| 500, | 575, | 51513 | 0.60 |
| 500, | 600, | 50897 | 0.46 |
| 500, | 625, | 51480 | 0.33 |
| 500, | 650, | 51664 | 0.29 |
| 500, | 675, | 51765 | 0.26 |
| 500, | 700, | 51844 | 0.31 |
| 500, | 725, | 51839 | 0.33 |
| 500, | 750, | 51866 | 0.50 |
| 550, | 825, | 51868 | 0.46 |
| 550, | 800, | 51826 | 0.31 |
| 550, | 775, | 51813 | 0.28 |
| 550, | 750, | 51704 | 0.28 |
| 550, | 725, | 51499 | 0.32 |
| 550, | 700, | 51074 | 0.33 |
| 550, | 675, | 51099 | 0.42 |
| 550, | 650, | 52074 | 0.51 |
| 550, | 625, | 52595 | 0.54 |
| 550, | 600, | 51546 | 0.63 |
| 550, | 575, | 51577 | 0.63 |
| 550, | 550, | 52603 | 0.50 |
| 550, | 525, | 52201 | 0.42 |
| 550, | 500, | 52094 | 0.37 |
| 550, | 475, | 51918 | 0.33 |
| 550, | 450, | 51904 | 0.33 |
| 550, | 425, | 51876 | 0.31 |
| 550, | 400, | 51886 | 0.37 |
| 550, | 375, | 51879 | 0.41 |
| 550, | 350, | 51844 | 0.44 |
| 550, | 325, | 51873 | 0.42 |
| 550, | 300, | 51910 | 0.44 |
| 550, | 275, | 51897 | 0.41 |
| 550, | 250, | 51897 | 0.32 |
| 550, | 225, | 51899 | 0.28 |
| 550, | 200, | 51903 | 0.27 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 550, | 175, | 51915 | 0.33 |
| 550, | 150, | 51910 | 0.41 |
| 550, | 125, | 51897 | 0.46 |
| 550, | 100, | 51894 | 0.48 |
| 550, | 50, | 51896 | 0.41 |
| 550, | 25, | 52037 | 0.36 |
| 550, | 0, | 51934 | 0.41 |
| 600, | 0, | 51900 | 0.42 |
| 600, | 25, | 51893 | 0.36 |
| 600, | 50, | 51888 | 0.33 |
| 600, | 75, | 51898 | 0.37 |
| 600, | 100, | 51867 | 0.38 |
| 600, | 125, | 51867 | 0.37 |
| 600, | 150, | 51880 | 0.35 |
| 600, | 175, | 51885 | 0.30 |
| 600, | 200, | 51878 | 0.28 |
| 600, | 225, | 51872 | 0.30 |
| 600, | 250, | 51873 | 0.33 |
| 600, | 275, | 51863 | 0.36 |
| 600, | 300, | 51852 | 0.37 |
| 600, | 325, | 51848 | 0.40 |
| 600, | 350, | 51845 | 0.42 |
| 600, | 375, | 51829 | 0.49 |
| 600, | 400, | 51805 | 0.48 |
| 600, | 425, | 51799 | 0.42 |
| 600, | 450, | 51717 | 0.37 |
| 600, | 475, | 51688 | 0.39 |
| 600, | 500, | 51719 | 0.40 |
| 600, | 525, | 52076 | 0.55 |
| 600, | 550, | 51717 | 0.56 |
| 600, | 575, | 52106 | 0.70 |
| 600, | 600, | 52041 | 0.74 |
| 600, | 625, | 51353 | 0.52 |
| 600, | 650, | 52747 | 0.50 |
| 600, | 675, | 52365 | 0.55 |
| 600, | 700, | 50892 | 0.52 |
| 600, | 725, | 51350 | 0.40 |
| 600, | 750, | 51562 | 0.34 |
| 600, | 775, | 51736 | 0.30 |
| 600, | 800, | 51826 | 0.32 |
| 600, | 825, | 51862 | 0.33 |
| 600, | 850, | 51840 | 0.5. |
| 650, | 900, | 51870 | 0.45 |
| 650, | 875, | 51819 | 0.37 |
| 650, | 850, | 51796 | 0.39 |
| 650, | 825, | 51598 | 0.30 |
| 650, | 800, | 51161 | 0.40 |
| 650, | 775, | 50807 | 0.51 |
| 650, | 750, | 52248 | 0.56 |
| 650, | 725, | 52267 | 0.51 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 650, | 700, | 50925 | 0.57 |
| 650, | 675, | 52622 | 0.69 |
| 650, | 650, | 53257 | 0.53 |
| 650, | 625, | 52060 | 0.44 |
| 650, | 600, | 52389 | 0.49 |
| 650, | 575, | 52420 | 0.54 |
| 650, | 550, | 52014 | 0.55 |
| 650, | 525, | 51621 | 0.48 |
| 650, | 500, | 52252 | 0.54 |
| 650, | 475, | 51837 | 0.52 |
| 650, | 450, | 51730 | 0.50 |
| 650, | 425, | 51651 | 0.50 |
| 650, | 400, | 51717 | 0.48 |
| 650, | 375, | 51783 | 0.46 |
| 650, | 350, | 51823 | 0.42 |
| 650, | 325, | 51839 | 0.39 |
| 650, | 300, | 51849 | 0.39 |
| 650, | 275, | 51867 | 0.42 |
| 650, | 250, | 51876 | 0.38 |
| 650, | 225, | 51877 | 0.39 |
| 650, | 200, | 51884 | 0.33 |
| 650, | 175, | 51886 | 0.32 |
| 650, | 150, | 51887 | 0.34 |
| 650, | 125, | 51822 | 0.33 |
| 650, | 100, | 51897 | 0.36 |
| 650, | 75, | 51897 | 0.42 |
| 650, | 50, | 51897 | 0.43 |
| 650, | 25, | 51918 | 0.41 |
| 650, | 0, | 51882 | 0.43 |
| 700, | 0, | 51900 | 0.36 |
| 700, | 25, | 51873 | 0.36 |
| 700, | 50, | 51873 | 0.29 |
| 700, | 75, | 51886 | 0.28 |
| 700, | 100, | 51874 | 0.31 |
| 700, | 125, | 51879 | 0.34 |
| 700, | 150, | 51860 | 0.38 |
| 700, | 175, | 51850 | 0.35 |
| 700, | 200, | 51859 | 0.36 |
| 700, | 225, | 51844 | 0.34 |
| 700, | 250, | 51852 | 0.32 |
| 700, | 275, | 51822 | 0.36 |
| 700, | 300, | 51823 | 0.43 |
| 700, | 325, | 51769 | 0.45 |
| 700, | 350, | 51724 | 0.49 |
| 700, | 375, | 51791 | 0.50 |
| 700, | 400, | 52197 | 0.51 |
| 700, | 425, | 52101 | 0.58 |
| 700, | 450, | 51841 | 0.60 |
| 700, | 475, | 52008 | 0.60 |
| 700, | 500, | 52023 | 0.66 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 700, | 525, | 52193 | 0.62 |
| 700, | 550, | 51999 | 0.54 |
| 700, | 575, | 51573 | 0.43 |
| 700, | 600, | 51273 | 0.41 |
| 700, | 625, | 51766 | 0.43 |
| 700, | 650, | 51955 | 0.47 |
| 700, | 675, | 52116 | 0.44 |
| 700, | 700, | 52877 | 0.40 |
| 700, | 725, | 52053 | 0.67 |
| 700, | 750, | 51011 | 0.34 |
| 700, | 775, | 52363 | 0.51 |
| 700, | 800, | 52058 | 0.74 |
| 700, | 825, | 50810 | 0.61 |
| 700, | 850, | 51297 | 0.43 |
| 700, | 875, | 51699 | 0.38 |
| 700, | 900, | 51799 | 0.35 |
| 700, | 925, | 51345 | 0.36 |
| 700, | 950, | 51656 | 0.42 |
| 750, | 950, | 51835 | 0.32 |
| 750, | 925, | 51771 | 0.31 |
| 750, | 900, | 51536 | 0.36 |
| 750, | 875, | 50772 | 0.56 |
| 750, | 850, | 53596 | 0.68 |
| 750, | 825, | 51115 | 0.62 |
| 750, | 800, | 52510 | 0.63 |
| 750, | 775, | 52518 | 0.45 |
| 750, | 750, | 51987 | 0.38 |
| 750, | 725, | 51770 | 0.33 |
| 750, | 700, | 51714 | 0.37 |
| 750, | 675, | 51438 | 0.18 |
| 750, | 650, | 51241 | 0.48 |
| 750, | 625, | 52062 | 0.39 |
| 750, | 600, | 52226 | 0.63 |
| 750, | 575, | 51900 | 0.48 |
| 750, | 550, | 51670 | 0.47 |
| 750, | 525, | 52076 | 0.53 |
| 750, | 500, | 52334 | 0.39 |
| 750, | 475, | 52439 | 0.64 |
| 750, | 450, | 52218 | 0.59 |
| 750, | 425, | 52293 | 0.69 |
| 750, | 400, | 51706 | 0.54 |
| 750, | 375, | 51992 | 0.54 |
| 750, | 350, | 51753 | 0.45 |
| 750, | 325, | 51759 | 0.36 |
| 750, | 300, | 51824 | 0.42 |
| 750, | 275, | 51662 | 0.36 |
| 750, | 250, | 51841 | 0.39 |
| 750, | 200, | 51858 | 0.40 |
| 750, | 175, | 51867 | 0.44 |
| 750, | 150, | 51873 | 0.40 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 750, | 125, | 51885 | 0.40 |
| 750, | 100, | 51884 | 0.33 |
| 750, | 75, | 51899 | 0.29 |
| 750, | 50, | 51877 | 0.30 |
| 750, | 25, | 51906 | 0.36 |
| 750, | 0, | 51840 | 0.42 |
| 800, | 0, | 51999 | 0.49 |
| 800, | 25, | 51831 | 0.42 |
| 800, | 50, | 51871 | 0.43 |
| 800, | 75, | 51854 | 0.42 |
| 800, | 100, | 51871 | 0.44 |
| 800, | 125, | 51856 | 0.43 |
| 800, | 150, | 51844 | 0.39 |
| 800, | 175, | 51891 | 0.38 |
| 800, | 200, | 51822 | 0.44 |
| 800, | 225, | 51789 | 0.44 |
| 800, | 250, | 51670 | 0.44 |
| 800, | 275, | 51505 | 0.57 |
| 800, | 300, | 51849 | 0.53 |
| 800, | 325, | 52343 | 0.51 |
| 800, | 350, | 51695 | 0.55 |
| 800, | 375, | 51944 | 0.58 |
| 800, | 400, | 52290 | 0.61 |
| 800, | 425, | 52029 | 0.59 |
| 800, | 450, | 51970 | 0.55 |
| 800, | 475, | 51849 | 0.51 |
| 800, | 500, | 52023 | 0.54 |
| 800, | 525, | 52487 | 0.61 |
| 800, | 550, | 51761 | 0.50 |
| 800, | 575, | 51761 | 0.47 |
| 800, | 600, | 52369 | 0.58 |
| 800, | 625, | 52200 | 0.55 |
| 800, | 650, | 51288 | 0.45 |
| 800, | 675, | 51349 | 0.45 |
| 800, | 700, | 51675 | 0.50 |
| 800, | 725, | 51431 | 0.32 |
| 800, | 750, | 51952 | 0.68 |
| 800, | 775, | 52373 | 0.82 |
| 800, | 800, | 52396 | 0.69 |
| 800, | 825, | 51850 | 0.53 |
| 800, | 850, | 51672 | 0.48 |
| 800, | 875, | 51862 | 0.43 |
| 800, | 900, | 51860 | 0.39 |
| 850, | 850, | 51839 | 0.43 |
| 850, | 825, | 51832 | 0.40 |
| 850, | 800, | 51777 | 0.39 |
| 850, | 775, | 51739 | 0.45 |
| 850, | 750, | 51807 | 0.66 |
| 850, | 725, | 52152 | 0.89 |
| 850, | 700, | 51949 | 0.51 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 830, | 675, | 51978 | 0.48 |
| 850, | 650, | 51865 | 0.50 |
| 850, | 625, | 51969 | 0.45 |
| 850, | 600, | 51730 | 0.39 |
| 850, | 575, | 51673 | 0.53 |
| 850, | 550, | 52729 | 0.63 |
| 850, | 525, | 51816 | 0.54 |
| 850, | 500, | 52035 | 0.57 |
| 850, | 475, | 52342 | 0.57 |
| 850, | 450, | 52137 | 0.60 |
| 850, | 425, | 51575 | 0.32 |
| 850, | 400, | 51829 | 0.49 |
| 850, | 375, | 52207 | 0.56 |
| 850, | 350, | 51913 | 0.55 |
| 850, | 325, | 51934 | 0.60 |
| 850, | 300, | 51732 | 0.49 |
| 850, | 275, | 52173 | 0.55 |
| 850, | 250, | 52199 | 0.52 |
| 850, | 225, | 51944 | 0.45 |
| 850, | 200, | 51804 | 0.47 |
| 850, | 175, | 51842 | 0.42 |
| 850, | 150, | 51867 | 0.41 |
| 850, | 125, | 51840 | 0.39 |
| 850, | 100, | 51880 | 0.41 |
| 850, | 75, | 51875 | 0.44 |
| 850, | 50, | 51885 | 0.44 |
| 850, | 25, | 51881 | 0.45 |
| 850, | 0, | 51858 | 0.44 |
| 900, | 0, | 51888 | 0.40 |
| 900, | 25, | 51860 | 0.30 |
| 900, | 50, | 51869 | 0.31 |
| 900, | 75, | 51870 | 0.39 |
| 900, | 100, | 51863 | 0.43 |
| 900, | 125, | 51854 | 0.46 |
| 900, | 150, | 51838 | 0.43 |
| 900, | 175, | 51858 | 0.40 |
| 900, | 200, | 51984 | 0.39 |
| 900, | 225, | 52023 | 0.39 |
| 900, | 250, | 51810 | 0.43 |
| 900, | 275, | 51835 | 0.52 |
| 900, | 300, | 52341 | 0.58 |
| 900, | 325, | 52129 | 0.53 |
| 900, | 350, | 51566 | 0.51 |
| 900, | 375, | 51703 | 0.57 |
| 900, | 400, | 52197 | 0.71 |
| 900, | 425, | 52475 | 0.80 |
| 900, | 450, | 51730 | 0.61 |
| 900, | 475, | 51755 | 0.53 |
| 900, | 500, | 52061 | 0.58 |
| 900, | 525, | 51743 | 0.50 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 900, | 550, | 51944 | 0.53 |
| 900, | 575, | 52296 | 0.54 |
| 900, | 600, | 52013 | 0.43 |
| 900, | 625, | 52364 | 0.47 |
| 900, | 650, | 52347 | 0.46 |
| 900, | 675, | 52126 | 0.46 |
| 900, | 700, | 51937 | 0.52 |
| 900, | 725, | 51714 | 0.50 |
| 900, | 750, | 51706 | 0.29 |
| 900, | 775, | 51742 | 0.34 |
| 900, | 800, | 51778 | 0.36 |
| 900, | 825, | 51805 | 0.44 |
| 950, | 800, | 51824 | 0.43 |
| 950, | 775, | 51810 | 0.37 |
| 950, | 750, | 51769 | 0.28 |
| 950, | 725, | 51747 | 0.30 |
| 950, | 700, | 51732 | 0.26 |
| 950, | 675, | 51759 | 0.30 |
| 950, | 650, | 51819 | 0.35 |
| 950, | 625, | 52062 | 0.42 |
| 950, | 600, | 52404 | 0.46 |
| 950, | 575, | 52080 | 0.46 |
| 950, | 550, | 51858 | 0.43 |
| 950, | 525, | 52189 | 0.50 |
| 950, | 500, | 51941 | 0.54 |
| 950, | 475, | 51797 | 0.48 |
| 950, | 450, | 52692 | 0.62 |
| 950, | 425, | 52193 | 0.54 |
| 950, | 400, | 51850 | 0.56 |
| 950, | 375, | 51982 | 0.56 |
| 950, | 350, | 52046 | 0.69 |
| 950, | 325, | 51935 | 0.57 |
| 950, | 300, | 51771 | 0.50 |
| 950, | 275, | 52015 | 0.59 |
| 950, | 250, | 52520 | 0.46 |
| 950, | 225, | 52270 | 0.53 |
| 950, | 200, | 51999 | 0.51 |
| 950, | 175, | 51784 | 0.36 |
| 950, | 150, | 51940 | 0.37 |
| 950, | 125, | 51896 | 0.51 |
| 950, | 100, | 51904 | 0.43 |
| 950, | 75, | 51896 | 0.35 |
| 950, | 50, | 51875 | 0.30 |
| 950, | 25, | 51902 | 0.34 |
| 950, | 0, | 51894 | 0.30 |
| 1000, | 0, | 51906 | 0.39 |
| 1000, | 25, | 51902 | 0.29 |
| 1000, | 50, | 51888 | 0.28 |
| 1000, | 75, | 51897 | 0.33 |
| 1000, | 100, | 51894 | 0.48 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 1000, | 125, | 51879 | 0.51 |
| 1000, | 150, | 51920 | 0.49 |
| 1000, | 175, | 51890 | 0.51 |
| 1000, | 200, | 51913 | 0.47 |
| 1000, | 225, | 51876 | 0.45 |
| 1000, | 250, | 51877 | 0.49 |
| 1000, | 275, | 52330 | 0.62 |
| 1000, | 300, | 52835 | 0.75 |
| 1000, | 325, | 52069 | 0.72 |
| 1000, | 350, | 52394 | 0.68 |
| 1000, | 375, | 52179 | 0.59 |
| 1000, | 400, | 52045 | 0.64 |
| 1000, | 425, | 51874 | 0.58 |
| 1000, | 450, | 52476 | 0.56 |
| 1000, | 475, | 52391 | 0.67 |
| 1000, | 500, | 51792 | 0.56 |
| 1000, | 525, | 52350 | 0.50 |
| 1000, | 550, | 52502 | 0.51 |
| 1000, | 575, | 51533 | 0.39 |
| 1000, | 600, | 51750 | 0.36 |
| 1000, | 625, | 51754 | 0.31 |
| 1000, | 650, | 51749 | 0.29 |
| 1000, | 675, | 51768 | 0.31 |
| 1000, | 700, | 51807 | 0.32 |
| 1000, | 725, | 51789 | 0.33 |
| 1050, | 650, | 51806 | 0.33 |
| 1050, | 625, | 51774 | 0.33 |
| 1050, | 600, | 51748 | 0.32 |
| 1050, | 575, | 51749 | 0.31 |
| 1050, | 550, | 51739 | 0.34 |
| 1050, | 525, | 52021 | 0.40 |
| 1050, | 500, | 52631 | 0.56 |
| 1050, | 475, | 52541 | 0.67 |
| 1050, | 450, | 51900 | 0.69 |
| 1050, | 425, | 51625 | 0.66 |
| 1050, | 400, | 51755 | 0.72 |
| 1050, | 375, | 51479 | 0.70 |
| 1050, | 350, | 54495 | 0.71 |
| 1050, | 325, | 53793 | 0.81 |
| 1050, | 300, | 52115 | 0.35 |
| 1050, | 275, | 52240 | 0.64 |
| 1050, | 250, | 52134 | 0.61 |
| 1050, | 225, | 52184 | 0.46 |
| 1050, | 200, | 51853 | 0.45 |
| 1050, | 175, | 51877 | 0.49 |
| 1050, | 150, | 51833 | 0.51 |
| 1050, | 125, | 51895 | 0.44 |
| 1050, | 100, | 51868 | 0.41 |
| 1050, | 75, | 51889 | 0.32 |
| 1050, | 50, | 51899 | 0.36 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 1050, | 25, | 51898 | 0.33 |
| 1050, | 0, | 51912 | 0.41 |
| 1050, | 0, | 51945 | 0.37 |
| 1100, | 25, | 51914 | 0.35 |
| 1100, | 50, | 51918 | 0.35 |
| 1100, | 75, | 51913 | 0.40 |
| 1100, | 100, | 51899 | 0.42 |
| 1100, | 125, | 51879 | 0.51 |
| 1100, | 150, | 51888 | 0.47 |
| 1100, | 175, | 51971 | 0.43 |
| 1100, | 200, | 52237 | 0.38 |
| 1100, | 225, | 52232 | 0.39 |
| 1100, | 250, | 52038 | 0.43 |
| 1100, | 275, | 51915 | 0.43 |
| 1100, | 300, | 51876 | 0.46 |
| 1100, | 325, | 51859 | 0.50 |
| 1100, | 350, | 51711 | 0.49 |
| 1100, | 375, | 51692 | 0.47 |
| 1100, | 400, | 52379 | 0.44 |
| 1100, | 425, | 52716 | 0.57 |
| 1100, | 450, | 52532 | 0.49 |
| 1100, | 500, | 51878 | 0.41 |
| 1100, | 525, | 51727 | 0.40 |
| 1100, | 550, | 51755 | 0.38 |
| 1100, | 575, | 51763 | 0.34 |
| 1100, | 600, | 51802 | 0.33 |
| 1100, | 625, | 51806 | 0.34 |
| 1150, | 525, | 51822 | 0.37 |
| 1150, | 500, | 51811 | 0.39 |
| 1150, | 475, | 51790 | 0.42 |
| 1150, | 450, | 51784 | 0.42 |
| 1150, | 425, | 51836 | 0.38 |
| 1150, | 400, | 52718 | 0.43 |
| 1150, | 375, | 53185 | 0.57 |
| 1150, | 350, | 52776 | 0.38 |
| 1150, | 325, | 51870 | 0.40 |
| 1150, | 300, | 51864 | 0.40 |
| 1150, | 275, | 51878 | 0.39 |
| 1150, | 250, | 51874 | 0.40 |
| 1150, | 225, | 51924 | 0.42 |
| 1150, | 200, | 51936 | 0.41 |
| 1150, | 175, | 51919 | 0.42 |
| 1150, | 150, | 51913 | 0.41 |
| 1150, | 125, | 51917 | 0.48 |
| 1150, | 100, | 51914 | 0.46 |
| 1150, | 75, | 51892 | 0.40 |
| 1150, | 50, | 51915 | 0.37 |
| 1150, | 25, | 51920 | 0.34 |
| 1150, | 0, | 51929 | 0.42 |
| 1200, | 0, | 51939 | 0.36 |

D-1 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 1200, | 25, | 51928 | 0.35 |
| 1200, | 50, | 51906 | 0.42 |
| 1200, | 75, | 51914 | 0.41 |
| 1200, | 100, | 51934 | 0.40 |
| 1200, | 125, | 51891 | 0.43 |
| 1200, | 150, | 51925 | 0.37 |
| 1200, | 175, | 51900 | 0.38 |
| 1200, | 200, | 51903 | 0.45 |
| 1200, | 225, | 51964 | 0.40 |
| 1200, | 250, | 51976 | 0.36 |
| 1200, | 275, | 52340 | 0.36 |
| 1200, | 300, | 52750 | 0.42 |
| 1200, | 325, | 52272 | 0.43 |
| 1200, | 350, | 51983 | 0.42 |
| 1200, | 375, | 51837 | 0.45 |
| 1200, | 400, | 51828 | 0.42 |
| 1200, | 425, | 51842 | 0.41 |

D-4 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data

| X | Y | MAG | EM |
|---|---|---|---|
| 0, | 0, | 52225, | 0.24 |
| 0, | 25, | 52867, | 0.36 |
| 0, | 50, | 51750 | 0.3[illegible] |
| 0, | 75, | 52073, | 0.26 |
| 0, | 100, | 51798, | 0.27 |
| 0, | 125, | 51840, | 0.2[illegible] |
| 0, | 150, | 51861, | 0.31 |
| 0, | 175, | 51552, | 0.3[illegible] |
| 0, | 200, | 51750, | 0.[illegible] |
| 0, | 225, | 51875, | 0.34 |
| 0, | 250, | 51877, | 0.28 |
| 0, | 275, | 51881, | 0.2[illegible] |
| 0, | 300, | 51884, | 0.25 |
| 0, | 325, | 51900 | 0.24 |
| 0, | 350, | 52151, | 0.2[illegible] |
| 0, | 375, | 52412, | 0.28 |
| 0, | 400, | 52145, | 0.24 |
| 0, | 425 | 52269, | [illegible] |
| 0, | 450, | 51847, | 0.23 |
| 0, | 475, | 51893, | 0.22 |
| 0, | 500, | 51891, | 0.22 |
| 50, | 500, | 51941, | -- |
| 50, | 475, | 51938, | 0.20 |
| 50, | 450, | 51945, | 0.23 |
| 50, | 425, | 51900, | 0.25 |
| 50, | 400, | 51865, | 0.26 |
| 50, | 375, | 51927, | 0.24 |
| 50, | 350, | 51933, | 0.22 |
| 50, | 325, | 51934, | 0.22 |
| 50, | 300, | 51930, | 0.23 |
| 50, | 275, | 51928, | 0.24 |
| 50, | 250, | 51921, | 0.29 |
| 50, | 225, | 51904, | 0.43 |
| 50, | 200, | 51854, | 0.36 |
| 50, | 175, | 51972, | 0.32 |
| 50, | 150, | 51756, | 0.[illegible]1 |
| 50, | 125, | 51632, | 0.41 |
| 50, | 100, | 51938, | 0.[illegible]0 |
| 50, | 75, | 51767, | [illegible].30 |
| 50, | 50, | 51684, | [illegible].32 |
| 50, | 25, | 51618, | 0.40 |
| 50, | 0, | 52483, | 0.29 |
| 50, | -25, | 51968, | 0.24 |
| 100, | -25, | 51927, | 0.22 |
| 100, | 0, | 52057, | 0.26 |
| 100, | 25, | 51798, | 0.29 |
| 100, | 50, | 51798, | 0.34 |
| 100, | 75, | 51877, | 0.3[illegible] |

D-4 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 100, | 100, | 51865, | 0.42 |
| 100, | 125, | 51713, | 0.30 |
| 100, | 150, | 52018, | 0.28 |
| 100, | 175, | 51627, | 0.33 |
| 100, | 200, | 51772 | 0.34 |
| 100, | 225, | 51878, | 0.36 |
| 100, | 250, | 51677, | 0.28 |
| 100, | 275, | 52221, | 0.26 |
| 100, | 300, | 54963, | 0.22 |
| 100, | 325, | 54804, | 0.24 |
| 100, | 350, | 52070, | 0.24 |
| 100, | 375, | 51877, | 0.24 |
| 100, | 400, | 51874, | 0.26 |
| 100, | 425, | 51887, | 0.24 |
| 150, | 425, | 51929, | 0.24 |
| 150, | 400, | 51929, | 0.24 |
| 150, | 375, | 51931, | 0.24 |
| 150, | 350, | 51933, | 0.23 |
| 150, | 325, | 51925, | 0.24 |
| 150, | 300, | 51910, | 0.27 |
| 150, | 275, | 51906, | 0.30 |
| 150, | 250, | 51908, | 0.32 |
| 150, | 225, | 51898, | 0.40 |
| 150, | 200, | 51862, | 0.31 |
| 150, | 175, | 51702, | 0.30 |
| 150, | 150, | 52155, | 0.26 |
| 150, | 125, | 51931, | 0.25 |
| 150, | 100, | 52022, | 0.32 |
| 150, | 75, | 51960, | 0.46 |
| 150, | 50, | 51657, | -- |
| 150, | 25, | 52436, | 0.33 |
| 150, | 0, | 52008, | 0.26 |
| 150, | -25, | 51766, | 0.24 |
| 200, | -25, | 51848, | 0.26 |
| 200, | 0, | 52428, | 0.30 |
| 200, | 25, | 52200, | 0.32 |
| 200, | 50, | 51653, | 0.43 |
| 200, | 75, | 51868, | 0.33 |
| 200, | 100, | 51714, | 0.30 |
| 200, | 125, | 51877, | 0.26 |
| 200, | 150, | 51863, | 0.28 |
| 200, | 175, | 52298, | 0.24 |
| 200, | 200, | 52307, | 0.30 |
| 200, | 225, | 52333, | 0.33 |
| 200, | 250, | 52037, | 0.42 |
| 200, | 275, | 51702. | 0.32 |
| 200, | 300, | 51963. | 0.28 |
| 200, | 325. | 52236, | 0.26 |
| 200, | 350, | 51914, | 0.22 |

D-4 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 200, | 375, | 51871, | 0.20 |
| 200, | 400, | 52133, | 0.20 |
| 200, | 425, | 51882, | 0.20 |
| 250, | 425, | 51921, | 0.20 |
| 250, | 400, | 51921, | 0.21 |
| 250, | 375, | 51927, | 0.21 |
| 250, | 350, | 51843, | 0.22 |
| 250, | 325, | 51846, | 0.24 |
| 250, | 300, | 51833, | 0.27 |
| 250, | 275, | 52172, | 0.36 |
| 250, | 250, | 51907, | 0.44 |
| 250, | 225, | 51837, | 0.40 |
| 250, | 200, | 52014, | 0.34 |
| 250, | 175, | 51930, | 0.29 |
| 250, | 150, | 51857, | 0.26 |
| 250, | 125, | 51746, | 0.30 |
| 250, | 100, | 51911, | 0.27 |
| 250, | 75, | 51834, | 0.32 |
| 250, | 50, | 51677, | 0.36 |
| 250, | 25, | 32509, | --- |
| 250, | 0, | 52026, | 0.31 |
| 300, | 0, | 51744, | 0.46 |
| 300, | 25, | 52250, | 0.33 |
| 300, | 50, | 51922, | 0.30 |
| 300, | 75, | 52495, | 0.30 |
| 300, | 100, | 52435, | 0.33 |
| 300, | 125, | 54547, | 0.32 |
| 300, | 150, | 54755, | 0.34 |
| 300, | 175, | 52541, | 0.39 |
| 300, | 200, | 52128, | 0.40 |
| 300, | 225, | 51455, | 0.44 |
| 300, | 250, | 51909, | 0.38 |
| 300, | 275, | 51935, | 0.28 |
| 300, | 300, | 52046, | 0.24 |
| 300, | 325, | 52011, | 0.12 |
| 300, | 350, | 51857, | 0.24 |
| 300, | 375, | 51858, | 0.22 |
| 300, | 400, | 51886, | 0.21 |
| 300, | 400, | 51853, | 0.20 |
| 350, | 375, | 52460, | 0.16 |
| 350, | 350, | 51914, | 0.20 |
| 350, | 325, | 51852, | 0.24 |
| 350, | 300, | 51897, | 0.32 |
| 350, | 275, | 51776, | 0.27 |
| 350, | 250, | 51756, | 0.35 |
| 350, | 225, | 52532, | 0.46 |
| 350, | 200, | 52033, | 0.35 |
| 350, | 175, | 52254, | 0.36 |
| 350, | 150, | 51809, | 0.34 |
| 350, | 125, | 52085, | 0.36 |

D-4 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 350, | 100, | 51976, | 0.34 |
| 350, | 75, | 52221, | 0.41 |
| 350, | 50, | 51842, | 0.38 |
| 350, | 25, | 52044, | 0.40 |
| 350, | 0, | 51829, | 0.40 |
| 400, | 0, | 51804, | 0.31 |
| 400, | 25, | 52068, | 0.36 |
| 400, | 50, | 52817, | 0.34 |
| 400, | 75, | 53842, | 0.42 |
| 400, | 100, | 52006, | 0.43 |
| 400, | 125, | 52086, | 0.38 |
| 400, | 150, | 51929, | 0.34 |
| 400, | 175, | 51640, | 0.36 |
| 400, | 200, | 51892, | 0.39 |
| 400, | 225, | 52062, | 0.44 |
| 400, | 250, | 52038, | 0.30 |
| 400, | 275, | 51982, | 0.30 |
| 400, | 300, | 52180, | 0.27 |
| 400, | 325, | 51857, | 0.26 |
| 400, | 350, | 51931, | 0.23 |
| 400, | 375, | 51928, | 0.23 |
| 400, | 400, | 51858, | 0.13 |
| 430, | 400, | 52209, | 0.20 |
| 450, | 375, | 51865, | 0.20 |
| 450, | 350, | 51949, | 0.21 |
| 450, | 325, | 51728, | 0.24 |
| 450, | 300, | 51755, | 0.28 |
| 450, | 275, | 51971, | 0.27 |
| 450, | 250, | 51953, | 0.30 |
| 450, | 225, | 51941, | 0.40 |
| 450, | 200, | 51882, | 0.34 |
| 450, | 175, | 51922, | 0.35 |
| 450, | 150, | 51816, | 0.40 |
| 450, | 125, | 51799, | 0.32 |
| 450, | 100, | 51660, | 0.27 |
| 450, | 75, | 51805, | 0.32 |
| 450, | 50, | 51890, | 0.28 |
| 450, | 25, | 51759, | 0.26 |
| 450, | 0, | 51873, | 0.30 |
| 500, | 0, | 52533, | 0.29 |
| 500, | 25, | 53605, | 0.41 |
| 500, | 50, | 53393, | 0.40 |
| 500, | 75, | 52586, | 0.34 |
| 500, | 100, | 51866, | 0.30 |
| 500, | 125, | 51882, | 0.33 |
| 500, | 150, | 51797, | 0.36 |
| 500, | 175, | 51884, | 0.33 |
| 500, | 200, | 53453, | 0.37 |
| 500, | 225, | 51927, | 0.37 |
| 500, | 250, | 52480, | 0.32 |

D-4 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 500, | 275, | 51857, | 0.26 |
| 500, | 300; | 52133, | 0.24 |

D-3 LANDFILL GEOPGYSICAL SURVEY
Magnetometer and EM Data

| X | Y | MAG | EM |
|---|---|---|---|
| 0, | 0, | 51879 | 0.32 |
| 0, | 25, | 51930 | 0.46 |
| 0, | 50, | 51999 | 0.92 |
| 0, | 75, | 52006 | 2.16 |
| 0, | 100, | 51938 | 0.[illegible] |
| 0, | 125, | 51803 | [illegible] |
| 0, | 150, | 51847 | 0.[illegible] |
| 0, | 175, | 51861 | 0.43 |
| 0, | 200, | 51862 | 0.[illegible] |
| 0, | 225, | 51860 | 0.[illegible] |
| 0, | 250, | 51874 | 0.41 |
| 0, | 275, | 51776 | 0.[illegible] |
| 0, | 300, | 53379 | 0.05 |
| 0, | 325, | 51895 | 1.40 |
| 0, | 350, | 52106 | 1.20 |
| 0, | 375, | 51967 | 0.39 |
| 0, | 400, | 51892 | 0.43 |
| 0, | 425, | 51849 | 0.[illegible] |
| 0, | 450, | 51851 | 0.[illegible] |
| 50, | 0, | 51887 | 0.[illegible] |
| 50, | 25, | 51900 | 0.[illegible] |
| 50, | 50, | 51900 | 0.[illegible] |
| 50, | 75, | 51890 | 0.73 |
| 50, | 100, | 51975 | 0.10 |
| 50, | 125, | 51883 | 0.[illegible] |
| 50, | 150, | 51911 | 0.42 |
| 50, | 175, | 51914 | 0.[illegible] |
| 50, | 200, | 51905 | 0.[illegible] |
| 50, | 225, | 51905 | 0.[illegible] |
| 50, | 250, | 51905 | 0.[illegible] |
| 50, | 275, | 51905 | 0.41 |
| 50, | 300, | 51218 | 0.[illegible] |
| 50, | 325, | 51895 | 0.73 |
| 50, | 350, | 51901 | 0.30 |
| 50, | 375, | 51890 | 0.38 |
| 50, | 400, | 51926 | 0.38 |
| 50, | 425, | 51952 | 0.32 |
| 50, | 450, | 51830 | 0.34 |
| 100, | 0, | 51883 | 0.[illegible] |
| 100, | 25, | 51884 | 0.[illegible] |
| 100, | 50, | 51928 | 0.[illegible] |
| 100, | 75, | 51865 | 0.[illegible] |
| 100, | 100, | 50853 | 0.[illegible] |
| 100, | 125, | 51727 | 0.[illegible] |
| 100, | 150, | 51843 | 0.[illegible] |
| 100, | 175, | 51851 | 0.[illegible] |
| 100, | 200, | 51890 | 0.33 |
| 100, | 225, | 51879 | 0.[illegible] |
| 100, | 250, | 51886 | 0.[illegible] |
| 100, | 275, | 51857 | 0.[illegible] |

D-3 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 100, | 300, | 51410 | 0.02 |
| 100, | 325, | 51986 | 0.37 |
| 100, | 350, | 51852 | [illegible] |
| 100, | 375, | 51913 | 0.33 |
| 100, | 400, | 51902 | 0.36 |
| 100, | 425, | 51903 | 0.34 |
| 100, | 450, | 51897 | 0.33 |
| 150, | 0, | 51875 | [illegible] |
| 150, | 25, | 51877 | [illegible] |
| 150, | 50, | 51866 | [illegible] |
| 150, | 75, | 51939 | [illegible] |
| 150, | 100, | 50347 | [illegible] |
| 150, | 125, | 51863 | [illegible] |
| 150, | 150, | 52035 | [illegible] |
| 150, | 175, | 51872 | 0.37 |
| 150, | 200, | 51864 | 0.33 |
| 150, | 225, | 51873 | [illegible] |
| 150, | 250, | 51883 | 0.37 |
| 150, | 275, | 51884 | [illegible] |
| 150, | 300, | 51897 | [illegible] |
| 150, | 325, | 51903 | 0.31 |
| 150, | 350, | 51895 | 0.73 |
| 150, | 375, | 51877 | 0.30 |
| 150, | 400, | 51894 | 0.31 |
| 150, | 425, | 51881 | 0.30 |
| 150, | 450, | 51877 | 0.30 |
| 200, | 0, | 51874 | 0.59 |
| 200, | 25, | 51864 | 0.19 |
| 200, | 50, | 51868 | 0.51 |
| 200, | 75, | 51849 | 0.62 |
| 200, | 100, | 51247 | [illegible] |
| 200, | 125, | 51561 | 0.38 |
| 200, | 150, | 51875 | 0.54 |
| 200, | 175, | 52407 | 0.32 |
| 200, | 200, | 51834 | [illegible] |
| 200, | 225, | 51849 | [illegible] |
| 200, | 250, | 51897 | 0.34 |
| 200, | 275, | 51897 | [illegible] |
| 200, | 300, | 51436 | [illegible] |
| 200, | 325, | 51902 | [illegible] |
| 200, | 350, | 51882 | [illegible] |
| 200, | 375, | 51873 | [illegible] |
| 200, | 400, | 51275 | [illegible] |
| 200, | 425, | 51892 | [illegible] |
| 200, | 450, | 51885 | [illegible] |
| 250, | 25, | 51915 | 0.40 |
| 250, | 50, | 51906 | 0.45 |
| 250, | 75, | 51897 | 0.46 |
| 250, | 100, | 51554 | [illegible] |
| 250, | 125, | 51873 | [illegible] |

D-3 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 250, | 150, | 51903 | 0.41 |
| 250, | 175, | 51915 | 0.34 |
| 250, | 200, | 51754 | [illegible] |
| 250, | 225, | 51711 | [illegible] |
| 250, | 250, | 51868 | [illegible] |
| 250, | 275, | 51913 | [illegible] |
| 250, | 300, | 51929 | [illegible] |
| 250, | 325, | 51926 | [illegible] |
| 250, | 350, | 51929 | [illegible] |
| 250, | 375, | 51961 | [illegible] |
| 250, | 400, | 51923 | [illegible] |
| 250, | 425, | 51926 | [illegible] |
| 250, | 450, | 51917 | [illegible] |
| 300, | 0, | 51870 | [illegible] |
| 300, | 25, | 51905 | [illegible] |
| 300, | 50, | 52816 | [illegible] |
| 300, | 75, | 51964 | [illegible] |
| 300, | 100, | 51869 | [illegible] |
| 300, | 125, | 51870 | [illegible] |
| 300, | 150, | 51861 | [illegible] |
| 300, | 175, | 51871 | [illegible] |
| 300, | 200, | 51845 | 0.55 |
| 300, | 225, | 51845 | 0.34 |
| 300, | 250, | 51820 | 0.67 |
| 300, | 275, | 51619 | 1.40 |
| 300, | 300, | 51850 | [illegible] |
| 300, | 325, | 51859 | [illegible] |
| 300, | 350, | 51831 | [illegible] |
| 300, | 375, | 51890 | [illegible] |
| 300, | 400, | 51857 | [illegible] |
| -50, | 0, | 52130 | [illegible] |
| -50, | 25, | 51951 | [illegible] |
| -50, | 50, | 51879 | [illegible] |
| -50, | 75, | 51860 | [illegible] |
| -50, | 100, | 51337 | [illegible] |
| -50, | 125, | 51848 | [illegible] |
| -50, | 150, | 51931 | [illegible] |
| -50, | 175, | 51897 | [illegible] |
| -50, | 200, | 51906 | [illegible] |
| -50, | 225, | 51877 | [illegible] |
| -50, | 250, | 51899 | [illegible] |
| -50, | 275, | 51884 | [illegible] |
| -50, | 300, | 51434 | [illegible] |
| -50, | 325, | 51860 | [illegible] |
| -50, | 350, | 51908 | [illegible] |
| -50, | 375, | 51849 | [illegible] |
| -50, | 400, | 51974 | [illegible] |
| -50, | 425, | 52046 | [illegible] |
| -50, | 450, | 51902 | [illegible] |
| -100, | 0, | 51845 | [illegible] |

D-3 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| -100, | 25, | 51842 | 0.33 |
| -100, | 50, | 51831 | 0.53 |
| -100, | 75, | 51806 | 0.69 |
| -100, | 100, | 51885 | 0.40 |
| 100, | 125, | 51865 | 0.75 |
| -100, | 150, | 51833 | 0.52 |
| -100, | 175, | 51845 | 0.69 |
| -100, | 200, | 51842 | 0.60 |
| -100, | 225, | 51840 | 0.62 |
| -100, | 250, | 51833 | 1.33 |
| -100, | 275, | 51640 | 1.82 |
| -100, | 300, | 51935 | 0.46 |
| -100, | 325, | 51823 | 0.43 |
| -100, | 350, | 51805 | 0.72 |
| -100, | 375, | 51823 | 0.55 |
| -100, | 400, | 51695 | 0.23 |
| -100, | 450, | 51768 | 0.4 |
| -100, | 475, | 51843 | 0.1 |

D-11 LANDFILL GEOPHYSICAL SURVEY
EM Data

| X | Y | EM |
|---|---|---|
| 0, | 0, | 0.13 |
| 0, | 13, | 0.16 |
| 0, | 33, | 0.15 |
| 0, | 45, | 0.16 |
| 0, | 32, | 0.15 |
| 0, | 92, | 0.15 |
| 0, | 147, | 0.13 |
| 0, | 175, | 0.17 |
| 0, | 187, | 0.20 |
| 0, | 200, | 0.18 |
| 0, | 204, | 0.20 |
| 0, | 219, | 0.21 |
| 0, | 228, | 0.22 |
| 0, | 247, | 0.24 |
| 0, | 263, | 0.23 |
| 0, | 272, | 0.22 |
| 0, | 287, | 0.20 |
| 0, | 298, | 0.17 |
| 0, | 319, | 0.18 |
| 0, | 363, | 0.19 |
| 0, | 389, | 0.20 |
| 0, | 378, | 0.18 |
| 0, | 384, | 0.16 |
| 0, | 394, | 0.19 |
| 0, | 400, | 0.16 |
| 0, | 416, | 0.17 |
| 0, | 427, | 0.18 |
| 0, | 435, | 0.16 |
| 0, | 500, | 0.13 |
| 0, | 523, | 0.14 |
| 0, | 545, | 0.13 |
| 0, | 556, | 0.14 |
| 0, | 589, | 0.16 |
| 0, | 605, | 0.15 |
| 0, | 610, | 0.11 |
| 0, | 625, | 0.10 |
| 0, | 640, | 0.14 |
| 0, | 800, | 0.14 |
| 30, | 800, | 0.16 |
| 50, | 789, | 0.13 |
| 50, | 776, | 0.14 |
| 50, | 635, | 0.10 |
| 50, | 614, | 0.16 |
| 50, | 601, | 0.12 |
| 50, | 523, | 0.16 |
| 50, | 500, | 0.18 |
| 50, | 492, | 0.17 |
| 50, | 484, | 0.15 |
| 50, | 474, | 0.16 |
| 50, | 456, | 0.17 |

D-11 LANDFILL GEOPHYSICAL SURVEY
EM Data (cont.)

| X | Y | EM |
|---|---|---|
| 50, | 453, | 0.20 |
| 50, | 445, | 0.19 |
| 50, | 435, | 0.20 |
| 50, | 395, | 0.19 |
| 50, | 382, | 0.18 |
| 50, | 368, | 0.17 |
| 50, | 357, | 0.18 |
| 50, | 351, | 0.17 |
| 50, | 347, | 0.16 |
| 50, | 336, | 0.18 |
| 50, | 328, | 0.17 |
| 50, | 322, | 0.16 |
| 50, | 315, | 0.18 |
| 50, | 301, | 0.20 |
| 50, | 239, | 0.22 |
| 50, | 230, | 0.20 |
| 50, | 205, | 0.19 |
| 50, | 191, | 0.18 |
| 50, | 138, | 0.17 |
| 50, | 177, | 0.16 |
| 50, | 88, | 0.15 |
| 50, | 80, | 0.16 |
| 50, | 72, | 0.15 |
| 50, | 64, | 0.14 |
| 50, | 0, | 0.14 |
| -100, | 0, | 0.17 |
| -100, | 9, | 0.16 |
| -100, | 20, | 0.17 |
| -100, | 31, | 0.16 |
| -100, | 55, | 0.15 |
| -100, | 96, | 0.15 |
| -100, | 104, | 0.14 |
| -100, | 119, | 0.13 |
| -100, | 142, | 0.16 |
| -100, | 161, | 0.15 |
| -100, | 179, | 0.16 |
| -100, | 200, | 0.15 |
| -100, | 223, | 0.17 |
| -100, | 232, | 0.16 |
| -100, | 248, | 0.18 |
| -100, | 261, | 0.16 |
| -100, | 286, | 0.18 |
| 100, | 298, | 0.17 |
| -100, | 313, | 0.16 |
| -100, | 326, | 0.20 |
| -100, | 340, | 0.19 |
| -100, | 357, | 0.21 |
| -100, | 381, | 0.13 |
| -100, | 388, | 0.17 |
| -100, | 400, | 0.17 |

D-11 LANDFILL GEOPHYSICAL SURVEY
EM Data (cont.)

| X | Y | EM |
|---|---|---|
| -100, | 507, | 0.18 |
| -100, | 520, | 0.17 |
| -100, | 525, | 0.16 |
| -100, | 546, | 0.17 |
| -100, | 560, | 0.18 |
| -100, | 600, | 0.16 |
| -100, | 617, | 0.18 |
| -100, | 627, | 0.19 |
| -100, | 633, | 0.18 |
| -100, | 639, | 0.19 |
| -100, | 671, | 0.18 |
| -100, | 679, | 0.21 |
| -100, | 700, | 0.19 |
| -100, | 727, | 0.18 |
| -100, | 765, | 0.17 |
| -100, | 771, | 0.18 |
| -50, | 785, | 0.18 |
| -50, | 564, | 0.19 |
| -50, | 500, | 0.18 |
| -50, | 460, | 0.18 |
| -50, | 400, | 0.17 |
| -50, | 380, | 0.18 |
| -50, | 360, | 0.19 |
| -50, | 350, | 0.20 |
| -50, | 300, | 0.18 |
| -50, | 280, | 0.20 |
| -50, | 250, | 0.16 |
| -50, | 215, | 0.18 |
| -50, | 175, | 0.19 |
| -50, | 150, | 0.20 |
| 50, | 140, | 0.17 |
| -50, | 125, | 0.19 |
| -50, | 100, | 0.14 |

D-7 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data

| X | Y | MAG | EM |
|---|---|---|---|
| 0, | 0, | 51794 | 0.43 |
| 0, | 20, | 51864 | 0.44 |
| 0, | 40, | 51906 | 0.47 |
| 0, | 60, | 51917 | 0.41 |
| 0, | 80, | 51883 | 0.44 |
| 0, | 100, | 51744 | 0.46 |
| 0, | 120, | 51823 | 0.46 |
| 0, | 140, | 51838 | 0.46 |
| 0, | 160, | 51830 | 0.44 |
| 0, | 180, | 51838 | 0.43 |
| 0, | 200, | 51798 | 0.40 |
| 0, | 220, | 51889 | 0.42 |
| 0, | 240, | 51796 | 0.38 |
| 0, | 260, | 51660 | 0.36 |
| 0, | 290, | 51676 | 0.35 |
| 0, | 310, | 51620 | 0.33 |
| 0, | 330, | 51194 | 0.36 |
| 0, | 350, | 50870 | 0.42 |
| 0, | 370, | 52349 | 0.40 |
| 0, | 390, | 52947 | 0.41 |
| 0, | 410, | 52278 | 0.40 |
| 0, | 430, | 51769 | 0.40 |
| 0, | 450, | 51853 | 0.43 |
| 0, | 470, | 51881 | 0.44 |
| 0, | 490, | 51829 | 0.46 |
| 0, | 510, | 51900 | 0.48 |
| 0, | 530, | 51846 | 0.30 |
| 50, | 0, | 51866 | 0.60 |
| 50, | 20, | 51870 | 0.55 |
| 50, | 40, | 51865 | 0.50 |
| 50, | 60, | 51901 | 0.53 |
| 50, | 80, | 51867 | 0.56 |
| 50, | 100, | 51856 | 0.73 |
| 50, | 120, | 51868 | 0.69 |
| 50, | 140, | 51864 | 1.0 |
| 50, | 160, | 51861 | 1.15 |
| 50, | 180, | 51861 | 1.33 |
| 50, | 200, | 51854 | 1.55 |
| 50, | 220, | 51836 | 1.33 |
| 50, | 240, | 51854 | 1.12 |
| 50, | 260, | 51857 | 1.05 |
| 50, | 280, | 51848 | 1.00 |
| 50, | 300, | 51840 | 1.10 |
| 50, | 320, | 51816 | 1.00 |
| 50, | 340, | 51764 | 0.93 |
| 50, | 360, | 51649 | 0.85 |
| 50, | 380, | 51688 | 0.70 |
| 50, | 400, | 51672 | 0.55 |
| 50, | 420, | 51596 | 0.52 |

D-7 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 50, | 440, | 51823 | 0.49 |
| 50, | 460, | 51836 | 0.50 |
| 50, | 480, | 51996 | 0.51 |
| 50, | 500, | 51852 | 0.52 |
| 50, | 520, | 51856 | 0.48 |
| 50, | 530, | 51859 | 0.46 |
| 100, | 0, | 51393 | 0.38 |
| 100, | 20, | 52051 | 0.51 |
| 100, | 40, | 51784 | 0.63 |
| 100, | -20 | 51512 | 0.38 |
| 100, | 60, | 51779 | 0.80 |
| 100, | 80, | 51812 | 0.51 |
| 100, | 100, | 51838 | 0.70 |
| 100, | 120, | 51836 | 0.80 |
| 100, | 140, | 51847 | 1.40 |
| 100, | 160, | 51853 | 1.25 |
| 100, | 180, | 51858 | 0.70 |
| 100, | 200, | 51859 | [illegible] |
| 100, | 220, | 51934 | [illegible] |
| 100, | 240, | 51875 | 1.57 |
| 100, | 260, | 51844 | 1.75 |
| 100, | 280, | 51822 | 2.00 |
| 100, | 300, | 52074 | 1.30 |
| 100, | 320, | 51829 | 1.60 |
| 100, | 340, | 51803 | 1.70 |
| 100, | 360, | 52120 | 1.80 |
| 100, | 380, | 52029 | 2.00 |
| 100, | 400, | 51769 | 1.80 |
| 100, | 420, | 51793 | 1.30 |
| 100, | 440, | 51769 | 1.20 |
| 100, | 460, | 51826 | 0.80 |
| 100, | 480, | 52024 | 0.65 |
| 100, | 500, | 51869 | 0.62 |
| 100, | 520, | 51870 | 0.70 |
| 100, | 530, | 51875 | 0.76 |
| 150, | 530, | 51863 | 0.85 |
| 150, | 520, | 51858 | 0.73 |
| 150, | 500, | 51809 | 0.80 |
| 150, | 480, | 51892 | 1.00 |
| 150, | 460, | 51836 | 1.05 |
| 150, | 440, | 51883 | 1.00 |
| 150, | 420, | 51877 | 0.95 |
| 150, | 400, | 52054 | 0.80 |
| 150, | 380, | 51826 | 0.10 |
| 150, | 360, | 51930 | 0.80 |
| 150, | 340, | 51891 | 0.75 |
| 150, | 320, | 51868 | 1.00 |
| 150, | 300, | 51872 | 1.10 |
| 150, | 280, | 51875 | 1.10 |
| 150, | 260, | 51870 | 1.11 |

D-7 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 150, | 240, | 51873 | 1.35 |
| 150, | 220, | 51870 | 1.15 |
| 150, | 200, | 51862 | 0.90 |
| 150, | 180, | 51847 | 0.80 |
| 150, | 160, | 51793 | 0.75 |
| 150, | 140, | 51727 | 0.57 |
| 150, | 120, | 51703 | 0.50 |
| 150, | 100, | 51976 | 0.40 |
| 150, | 80, | 51982 | 0.48 |
| 150, | 60, | 52310 | 0.42 |
| 150, | 40, | 51754 | 0.46 |
| 150, | 20, | 51878 | 0.52 |
| 150, | -20, | 51784 | 0.60 |
| 200, | 0, | 51957 | 0.54 |
| 200, | 20, | 51956 | 0.44 |
| 200, | 40, | 51948 | 0.39 |
| 200, | 60 , | 51937 | 0.36 |
| 200, | 80, | 51755 | 0.32 |
| 200, | 100, | 51585 | 0.44 |
| 200, | 120, | 51956 | 0.52 |
| 200, | 140, | 51911 | 0.66 |
| 200, | 160, | 51881 | 0.62 |
| 200, | 180, | 51878 | 0.70 |
| 200, | 200, | 51880 | 0.85 |
| 200, | 220, | 51884 | 1.00 |
| 200, | 240, | 51884 | 0.95 |
| 200, | 260, | 51782 | 0.90 |
| 200, | 280, | 51884 | 0.75 |
| 200, | 300, | 51884 | 0.70 |
| 200, | 320, | 51885 | 0.70 |
| 200, | 340, | 51880 | 0.66 |
| 200, | 360, | 51878 | 0.80 |
| 200, | 380, | 51869 | 0.85 |
| 200, | 400, | 51250 | 0.94 |
| 200, | 420, | 52465 | 0.75 |
| 200, | 440, | 51878 | 0.70 |
| 200, | 460, | 51897 | 0.70 |
| 200, | 480, | 51980 | 0.65 |
| 200, | 500, | 51644 | 0.50 |
| 200, | 520, | 51899 | 0.74 |
| 200, | 530, | 51977 | 0.70 |
| 250, | 500, | 51818 | 0.80 |
| 250, | 480, | 51966 | 0.50 |
| 250, | 460, | 51876 | 0.90 |
| 250, | 440, | 51976 | 0.50 |
| 250, | 420, | 51886 | 0.85 |
| 250, | 400, | 51878 | 0.30 |
| 250, | 380, | 51884 | 0.65 |
| 250, | 360, | 51887 | 0.70 |
| 250, | 340, | 51890 | 0.70 |

D-7 LANDFILL GEOPHYSICAL SURVEY
Magnetometer and EM Data (cont.)

| X | Y | MAG | EM |
|---|---|---|---|
| 250, | 320, | 51887 | 0.30 |
| 250, | 300, | 51885 | 0.85 |
| 250, | 280, | 51879 | 0.95 |
| 250, | 260, | 51895 | 1.10 |
| 250, | 240, | 51892 | 1.25 |
| 250, | 220, | 51891 | 0.95 |
| 250, | 200, | 51890 | 0.70 |
| 250, | 180, | 51891 | 0.57 |
| 250, | 160, | 51893 | 0.47 |
| 250, | 140, | 51922 | 0.46 |
| 250, | 120, | 51897 | 0.43 |
| 250, | 100, | 51892 | 0.44 |
| 250, | 80, | 51895 | 0.44 |
| 250, | 60, | 51898 | 0.48 |
| 250, | 40, | 51911 | 0.40 |
| 250, | 20, | 51921 | 0.38 |
| 250, | 0, | 51907 | 0.44 |
| 300, | 0, | 51893 | 0.37 |
| 300, | 20, | 51899 | 0.38 |
| 300, | 40, | 51873 | 0.40 |
| 300, | 60, | 51891 | 0.40 |
| 300, | 80, | 51881 | 0.38 |
| 300, | 100, | 51897 | 0.35 |
| 300, | 120, | 51883 | 0.38 |
| 300, | 140, | 51883 | 0.38 |
| 300, | 160, | 51890 | 0.40 |
| 300, | 180, | 51868 | 0.40 |
| 300, | 200, | 51896 | 0.42 |
| 300, | 220, | 51873 | 0.42 |
| 300, | 240, | 51872 | 0.42 |
| 300, | 260, | 51879 | 0.43 |
| 300, | 280, | 51885 | 0.44 |
| 300, | 300, | 51886 | 0.48 |
| 300, | 320, | 51887 | 0.50 |
| 300, | 340, | 51886 | 0.60 |
| 300, | 360, | 51857 | 0.56 |
| 300, | 380, | 51874 | 0.55 |
| 300, | 400, | 51884 | 0.60 |
| 300, | 420, | 51891 | 0.57 |
| 300, | 440, | 51889 | 0.61 |
| 300, | 460, | 51886 | 0.64 |
| 300, | 480, | 51886 | 0.66 |
| 300, | 500, | 51886 | 0.67 |
| 300, | 520, | 51876 | 0.70 |
| 300, | 530, | 51879 | 0.71 |

# APPENDIX J

# REFERENCES

# REFERENCES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# APPENDIX K

# BIOGRAPHIES

**MICHAEL E. BENNER, CPG** **Hydrogeologist**

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**EDUCATION:**

B.S., Geology, Waynesburg College

**EXPERIENCE:**

With 20 years' experience as a hydrogeologist, Mr. Benner has extensive background in evaluating water resources throughout the United States. A Certified Professional Geologist (CPG), American Institute of Professional Geologists, he has been E & E project manager for a variety of geologic and groundwater evaluations.

Mr. Benner has directed and performed 42 preliminary assessments/site inspections, 12 projects involving development and implementation of groundwater monitoring activities and subcontractor acquisition and oversight; 15 investigations involving ground- and surface water and soil sampling; and 14 projects requiring the planning for and application of various geophysical survey techniques to delineate the extent of contamination. He is responsible for coordinating E & E's Dallas office geophysical equipment logistics and procedures and has developed standard operating procedures for geophysical exploration surveys that currently are being used throughout the United States. Mr. Benner planned and managed E & E's remedial investigation for the Gurley Pits hazardous waste site, including an extensive site background study, multimedia sampling, geophysical surveys to identify off-site contaminated areas, and soil boring and groundwater monitoring. For E & E's extensive geophysical surveys of the IWC hazardous waste site in Fort Smith, Arkansas, he managed the remote-sensing surveys to identify waste disposal areas, define potential subsurface contaminant migration pathways, and provide predrilling safety clearance; provided expert geotechnical support for the development of the seismic refraction investigation; and conducted a magnetometer survey to provide safety clearance for the drilling operations. He also has developed and conducted classroom and field training programs in the application, performance, and interpretation of geophysical surveys.

He was E & E's site manager for a groundwater contamination study at a fiber plant in Odenton, Maryland, and for groundwater contamination monitoring programs at three sites in Iowa and at sites in New York and Pennsylvania. He conducted hydrogeological studies at the National Wood Preservers federal Superfund site in Haverford Township, Pennsylvania. At the McClintic Wildlife Refuge in West Virginia, he investigated the extent of subsurface contamination by DNT and ordnance manufacturing process waste; mapped the locations of wells, wastewater pipelines, and manholes; and determined the locations for core borings and monitoring wells. Mr. Benner also designed and supervised the installation of groundwater monitoring systems for waste site investigations in Rochester, New York.

**WILLIAM C. PARK** **Biologist**

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**EDUCATION:**

B.S., Biology, Texas Christian University

**EXPERIENCE:**

Mr. Park recently conducted sampling and surveying on two low-level radioactive waste sites: Fansteel Metals in Muskogee, Oklahoma; and Kerr McGee in Cusking, Oklahoma. He also is in charge of drum disposal for hazardous waste site investigation-derived waste generated by E & E Dallas operations.

In addition, during his two years as a team member for E & E investigations of hazardous waste sites, Mr. Park has performed extensive background data searches and participated in preliminary assessments, site inspections, and full-field investigations; collected samples of biota, soil, sediment, groundwater, and surface water; and monitored the activities of site contractors to ensure their compliance with client specifications. In addition, he has assisted in the development of site safety plans and assessed the impacts of hazardous and toxic materials on the vegetation and aquatic life surrounding contaminated areas. He has participated in the preparation of cost estimates for site cleanup and remedial activities.

Mr. Park has performed environmental sampling of soils and water, conducted air characterizations, and low-level radioactive materials sampling at several sites located in Texas and Oklahoma. He has also done air monitoring work for an asbestos abatement program.

**DONALD M. SMITH** **Chemist**

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## EDUCATION:

B.S., Chemistry/Biology, East Texas State University

## EXPERIENCE:

For E & E investigations of hazardous waste sites, Mr. Smith conducts multimedia environmental sampling, soil gas surveys, ambient air monitoring, and contractor monitoring for cost-effectiveness and work plan compliance. He interprets the results of field and laboratory analyses to characterize on-site contaminants, define the magnitude and extent of contamination, and assist in the development of appropriate mitigative measures.

During one year as a chemist with an environmental research laboratory in Dallas, Texas, Mr. Smith conducted metal analyses and drug-screening assignments.

He has several years' experience as an instructor of chemistry and as a university research assistant involved in microbiological research.

As a member of the Field Investigation Team working under the USEPA, Mr. Smith performed environmental sampling, conducted air quality characterizations, and performed routine field analytical tests on soil and water samples at several sites including four industrial waste sites located in New Mexico, Oklahoma, and Arkansas, and a landfill near Dallas, Texas. He served as field chemist for investigations at two radiation sites in Oklahoma.

In addition to his field-related duties, Mr. Smith is responsible for review of analytical data and technical report preparation. In this capacity, he has completed projects involving investigations at various industrial facilities, landfills, and abandoned waste sites in Texas, Oklahoma, Arkansas, and Louisiana.

**PAUL BRODZIK** **Chemical Engineer**

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**EDUCATION:**

B.S., Chemical Engineering, University of Rochester

**EXPERIENCE:**

Mr. Brodzik applies his chemical engineering expertise to E & E investigations and remediation of hazardous waste sites. He participates in preliminary assessments and full-field investigations; plans and conducts environmental sampling of soils, leachate, groundwater, and surface water; and takes part in the design, siting, and installation of groundwater monitoring-well systems. He evaluates the results of laboratory analyses in order to determine the nature, origin, and extent of contamination. He also provides chemical engineering support for the design and evaluation of appropriate feasible remedial measures and remedial action plans to contain, control, and clean up hazardous substances; and he monitors the activities of on-site remedial contractors.

His extensive participation in the planning stages of E & E's work at the Bridgeport Rental and Oil Services federal Superfund site included design of sampling plans and the quality assurance management plan. His responsibilities for this project also have included on-site sampling, data analysis, and remedial design of site incineration and wastewater treatment options. He also has determined subcontracting requirements to provide specifications for waste removal.

Mr. Brodzik has conducted environmental audits at chemical and fertilizer manufacturing facilities in Mexico, Costa Rica, Colombia, and Brazil. To complete the audits, he evaluated each plant's chemical handling, use, and storage procedures and waste production quantities in order to determine the environmental contamination potential. He interviewed plant personnel, local contractors, and government officials and assisted in developing work plans for groundwater studies. For the City of Rochester, New York, Mr. Brodzik developed an evaluation program to be used for the siting of a new industrial complex.

As a product assurance engineer for the United States Army Armament Research and Development Center in New Jersey, Mr. Brodzik provided extensive production and field support for on-site evaluations, development of test plans for suspect munitions, coordination of program development, scheduling and monitoring of program milestones, evaluation of test program data, and provision of recommendations concerning stockpile disposition.

**GERALD L. WEINSTEIN** **Toxicologist**

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## EDUCATION:

M.S., Environmental Science (Health), George Washington University
B.S., Chemistry, Carnegie-Mellon University

## EXPERIENCE:

With 18 years' experience in toxicology, chemistry, and the interpretation of pertinent federal and state regulations, Mr. Weinstein specializes in toxicological risk and endangerment assessment. For E & E investigations of hazardous waste sites, he interprets data concerning chemical characteristics, migration routes, and concentrations to determine exposure media, the human population at risk and potential impacts on sensitive environmental receptors.

For the Sapp Battery federal Superfund site in Florida, Mr. Weinstein conducted a comprehensive multimedia human health and environmental risk assessment for lead and other heavy metals to evaluate potential exposure to the public and to aquatic life. Human exposure routes evaluated included ingestion and inhalation of contaminated soil particles and ingestion of contaminated drinking water and fish. Based on the assessment, Mr. Weinstein developed media-specific cleanup criteria that were used for the selection, screening, and design of remedial alternatives for the site. Mr. Weinstein also has performed risk assessments for the remediation of human health risks posed by dioxins, polychlorinated biphenyls, and other chemicals at the Hyde Park, New York, federal Superfund site.

Mr. Weinstein worked for five years as an industrial hygienist with the Occupational Health and Safety Administration (OSHA) in Washington, DC. As project manager responsible for the development and promulgation of regulations designed to protect workers exposed to carcinogens, he critically evaluated toxicological and epidemiological studies assessing the toxic effects and associated risks of chemicals on humans; and wrote technical analyses representing OSHA determinations concerning the severity of health hazards, feasibility of control technology for reducing exposures, and derivation of the maximum permissible exposure limits.

**Gerald L. Weinstein (Cont.)**

As a toxicologist in Cambridge, Massachusetts, for two years Mr. Weinstein assisted in the assessment of human health risks associated with multimedia control strategies for six widely used chlorinated solvents (carbon tetrachloride, trichloroethylene, perchloroethylene, methylene chloride, 1,1,1-trichloroethane, and CFC-113). He analyzed toxicological effects, sources, and quantities of each solvent emitted; as well as intermedia transfers, ultimate fate, environmental risk, and human exposure factors. He was the manager and senior author for the preparation of two documents summarizing available data concerning environmental releases of 97 chemicals to air, water, and land.

**ANDREW P. CLIFTON** **Director, Analytical Services Center**

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**EDUCATION:**

B.S., Chemistry, cum laude, University of Sussex, Great Britain

**EXPERIENCE:**

As director of E & E's Analytical Services Center (ASC), Mr. Clifton has overall responsibility for the facility's operation as a multi-functional, high-quality environmental laboratory. He directs a staff of over 30 professional chemists and ensures that the laboratory quality assurance/quality control (QA/QC) program, laboratory and field sample chain-of-custody documentation and reporting procedures, and laboratory safety protocol are continually reviewed to incorporate the most current methodologies.

Mr. Clifton was instrumental in attaining the ASC's certification for the United States Environmental Protection Agency Contract Laboratory Program for the organic analysis of Superfund site samples. For this contract, Mr. Clifton is responsible for maintaining the ASC's state-of-the-art capabilities in gas chromatograph/mass spectrometer (GC/MS) and GC/electron capture detection instrumentation, and for insuring that the laboratory produces data that will withstand scrutiny in administrative and judicial proceedings.

With 18 years' experience as an analytical chemist, Mr. Clifton has managed and performed analyses of environmental samples for routine indicators of pollution as well as for specific pollutants such as pesticides, polychlorinated biphenyls and other toxic organics, and heavy metals. He was the manager of the environmental and analytical laboratory operated by E & E for the Royal Commission for Jubail and Yanbu at Madinat Yanbu Al-Sinaiyah, Saudi Arabia, where he was responsible for the analysis of seawater, groundwater, sanitary and industrial wastewater, and drinking water using atomic absorption, autoanalysis, gas chromatography/mass spectrometry, and classical laboratory techniques.

After earning his degree in chemistry, Mr. Clifton worked in marine research with the University College of Swansea (Wales, Great Britain) Oceanography Department, developing methods for trace metal analysis. In particular, he developed and implemented a method for detecting mercury in seawater, sediments, and animal tissue, using atomic absorption and atomic fluorescence spectrophotometry. His studies were published in British scientific journals. Working with a municipal authority in Brighton, England, he used autoanalysis, gas chromatography, atomic absorption, and fluorescence spectroscopy to analyze samples of river water, seawater, groundwater, and sewage for a spectrum of possible pollutants, including bacteria and trace metals.

**ROBERT A. MARSZALKOWSKI** **Environmental Engineer**

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**EDUCATION:**

M.S., Environmental Engineering, Polytechnical University of Warsaw, Poland
B.S., Civil Engineering, State University of New York at Buffalo

**EXPERIENCE:**

Mr. Marszalkowski has been a hazardous and toxic substance project manager with E & E for three years. He is presently program technical coordinator for E & E's work in support of the United States Air Force Installation Restoration Program, at various installations nationwide. In particular, Mr. Marszalkowski manages the presurvey and survey activities, including the preparation of work plans and detailed cost estimates for multiple-site remedial investigations (RIs). In other project management assignments for which he was responsible for logistics, timeliness, and technical quality, Mr. Marszalkowski led special investigations in Oregon at five suspected hazardous waste sites, including three municipal/industrial landfills, a munitions factory, and a wood-preserving chemical plant.

Mr. Marszalkowski held responsibility for the development of sampling specifications and estimation of manpower schedules, equipment, and associated costs for waste tank sampling, analysis, decontamination, removal, and disposal at the Bridgeport Rental and Oil Services National Priorities List (NPL) site in New Jersey, which involves the single largest Superfund allocation to date (over $55 million). He assisted in delineating the complex groundwater situation that exists beneath the site (i.e., three separate groundwater zones with areas of verticle migration between the upper and middle zone and the middle and deep zone); helped define potential contaminant migration pathways; and used this information to resolve engineering questions related to the design of the most appropriate remedial measures.

Mr. Marszalkowski designed remedial action strategies, completed a detailed feasibility evaluation of alternatives, and provided environmental engineering input to the preparation of a community relations presentation describing the selected remedial alternative for the Whitehouse Oil Pits NPL site. He was project manager for RI support activities conducted for the Commonwealth of Pennsylvania at the Welsh Road hazardous waste site, for which he wrote the remedial action master plan and work plan. He also assisted in the engineering review of remedial action plans during E & E's extensive investigative work at the Hyde Park NPL site in Niagara Falls, New York.

# APPENDIX L

# OVERVIEW OF RISK ASSESSMENT AND THE DEVELOPMENT OF STANDARDS AND CRITERIA

## L.1 INTRODUCTION

This appendix discusses development of standards and criteria used in the evaluation of concentration data of chemicals in soils and groundwater and surface water at or associated with the Reese Air Force Base.

As a first step in identifying criteria, E & E has prepared brief one- or two-page toxicological profiles for contaminants of potential concern defined as those reported in groundwater samples above levels of detection and the subject of at least one of the following drinking water standards or criteria: EPA primary drinking water standards or EPA Health Advisories. These profiles, found in Appendix M of this report, present short overviews of the toxicological effects. In addition, based upon the relevant potential route of human exposure (oral) and exposure medium (drinking water) the profiles also provide background on the applicable federal drinking water standards and criteria for each chemical.

The following sections present an overview of risk assessment and development of drinking water standards and criteria.

Section L.2 presents an overview of risk assessment and criteria used by the Environmental Protection Agency to categorize each of the chemicals as carcinogens and noncarcinogens. The section places emphasis on the categorization scheme, as whether a chemical ought to be a regulated carcinogen or not is usually the dominant factor resulting typically in orders of magnitude differences in human exposure levels concentrations currently estimated by federal and state agencies to present acceptable levels of risks.

Section L.3 describes the methodologies used to estimate risks for carcinogens and noncarcinogens.

Section L.4 summarizes drinking water standards and criteria, for the 12 contaminants of potential concern.

## L.2 CLASSIFICATION OF CHEMICALS AS CARCINOGENS OR NONCARCINOGENS

Based on significantly different theories on the shape of dose-response curves resulting in significantly different risk estimates, chemicals are often divided, for risk assessment purposes, into two categories--carcinogens and noncarcinogens. Risk assessment for carcinogens is based on the concept that any exposure to a carcinogen

may present a finite risk of cancer to man. Risk assessment for noncarcinogenic effects is based on the concept that there is a threshold exposure level below which adverse health consequences are not expected to occur. The term carcinogen means any chemical for which there is sufficient evidence that exposure may result in continuing uncontrolled cell division (cancer) in humans and/or animals. By the process of elimination, noncarcinogen is taken to mean any chemical for which the data are either negative or are insufficient to evaluate potential carcinogenicity. These definitions are not static. Rather, at any time, additional data may become available which shift the weight-of-evidence so that a noncarcinogen must be reclassified as a carcinogen, or alternatively a carcinogen as a noncarcinogen.

In this report, chemicals have been classified as carcinogens or noncarcinogens based on EPA weight-of-evidence criteria which take into account the quality and adequacy of the experimental data and kinds of responses induced by a suspect carcinogen (51 FR 33992, September 24, 1986). Table L-1 summarizes the five EPA weight-of-evidence categories in current use.

According to these EPA guidelines, chemicals in the first two groups--A or B ($B_1$ or $B_2$)--are considered to have sufficient evidence to be considered "human carcinogens" or "probable human carcinogens," and can be the subject of nonthreshold carcinogenic risk estimation procedures. Chemicals in group C, "possible human carcinogens," may or may not be subject to carcinogenic risk estimation procedures depending upon the quality of the data. The remaining chemicals--in groups D or E--are considered to be noncarcinogens and are subjected to standard threshold-based toxicological risk estimation procedures for noncarcinogenic end points.

Carcinogen classifications for all 11 of the contaminants have been based directly on EPA determinations. Table L-2 summarizes the classification of the 12 contaminants.

For more details concerning the categorization of any individual contaminant, refer to the respective profile in Appendix M.

Table L-1

FIVE EPA CATEGORIES FOR EVALUATING THE
EVIDENCE OF CHEMICAL CARCINOGENICITY

| Group | Description |
|---|---|
| Group A | Human Carcinogen - sufficient evidence from epidemiological studies |
| Group B | Probable Human Carcinogen - |
| Group $B_1$ | • At least limited evidence of carcinogenicity to humans |
| Group $B_2$ | • *Usually a combination of sufficient evidence for* animals and inadequate data for humans |
| Group C | Possible Human Carcinogen - limited evidence of carcinogenicity in animals in the absence of human data |
| Group D | Not Classifiable - inadequate human and animal evidence of carcinogenicity |
| Group E | Evidence of Noncarcinogenicity for Humans - no evidence of carcinogenicity in at least two adequate animal tests in different species or in both adequate epidemiological and animal studies |

Source: EPA 1986.

Table L-2

CARCINOGENICITY CLASSIFICATION OF CHEMICALS
ACCORDING TO EPA WEIGHT-OF-EVIDENCE CRITERIA[1]

| Chemical | EPA Classification[1] | Basis |
|---|---|---|
| Arsenic | A[3] | Human carcinogen based upon epidemiological studies; pending resolution of essentiality in human diet; EPA has not regulated arsenic as a carcinogen in drinking water |
| Cadmium | $B_1$[3] | Probable human carcinogen based upon sufficient evidence in epidemiological studies; not regulated as a carcinogen in drinking water because there is insufficient evidence by the oral route |
| Chromium | A[3] | Sufficient evidence for Cr(VI) in humans and animals by inhalation route; EPA has not regulated chromium as a carcinogen in drinking water due to insufficient evidence by the oral route |
| Copper | D[3] | Inadequate data to classify |
| Cyanides | D[3] | Inadequate data to classify |
| Dichlorobenzenes | D[2,3] | Inadequate data to classify |
| Dichloromethane (Methylene Chloride) | $B_2$[4] | Carcinogenic in animal studies |
| Lead | $B_2$[3] | Carcinogenic in animal studies; because of the extensive negative epidemiological evidence, EPA has proposed to regulate lead in drinking water based on noncarcinogenic effects. |
| Toluene | D[3] | Inadequate data to classify |
| Tetrachloroethene | $B_2$[5] | Carcinogenic in animal studies |
| 1,1,1-Trichloroethane | D[3] | Inadequate data to classify |
| Trichloroethene | $B_2$[2] | Carcinogenic in animal studies |

Footnotes:

1 EPA (1986a).
2 EPA (1985b).
3 EPA (1985c).
4 EPA (1985f).
5 EPA (1985h).

## L.3 RISK ASSFSSMENT PROCEDURES FOR CARCINOGENS AND NONCARCINOGENS

In contrast to noncarcinogenic effects for which thresholds are thought to occur, scientists have been unable to demonstrate experimentally a threshold for carcinogenic effects. This has led to the assumption by federal regulatory agencies (e.g., EPA, FDA, and OSHA) that since a threshold dose cannot be demonstrated, it should be assumed, based on conservative (health-protective) grounds, that any exposure to a carcinogen theoretically represents some finite risk to man. Depending on the potency of a specific carcinogen, such a risk would be vanishing small.

Scientists have developed several mathematical models to estimate low-dose carcinogenic risks from observed high-dose risks. Consistent with current theories of carcinogenesis, the EPA has selected the linearized multistage model based on prudent public health policy (51 FR 33992-34002, September 24, 1986). In addition to using the linearized multistage model, EPA uses the 95% upper confidence limit for doses or concentrations in animal or human studies to estimate low-dose unit cancer risk (UCR) or potency. By using these procedures, the agency believes it would be unlikely to underestimate the actual potency, thus making it correspondingly unlikely that it will underestimate the potential carcinogenic risks to humans.

Noncarcinogenic effects (e.g., skin irritation, birth defects, immunological effects, organ damage, etc.) are generally regarded to occur only above a minimum dose or threshold. Consequently, risk assessments for a chemical designated as a noncarcinogen attempt to derive an acceptable daily intake (ADI) or risk reference dose (RRfD) for exposure in humans based on its No-Observed-Adverse-Effect-Level (NOAEL) or No-Observed-Effect-Level (NOEL). In the absence of a suitable NOAEL or NOEL, the ADI may be based on a Lowest-Observed-Adverse-Effect-Level (LOAEL) or Lowest-Observed-Effect-Level (LOEL). Because the NOELs and NOAELs are usually determined by laboratory experiments in animals conducted at high doses to provide an added margin of safety, estimation of ADIs require the use of uncertainty factors to compensate for data limitations and the lack of precision in extrapolating from high doses in animals to lower doses in humans. Five uncertainty factors used by EPA are summarized in Table L-3 (EPA 1985c).

Table L-3

UNCERTAINTY FACTORS USED IN THE DERIVATION
OF ACCEPTABLE DAILY INTAKES

| Uncertainty Factor | Condition of Use |
|---|---|
| 10 | A 10-fold uncertainty factor is used with valid experimental results on appropriate durations of exposures of humans. |
| 100 | A 100-fold uncertainty factor is used when human data are not available, and extrapolation is made from valid results of long-term animal studies. |
| 1,000 | A 1,000-fold uncertainty factor is used when human data are not available and extrapolation is made from animal studies of less than chronic exposure. |
| 1-10 | An additional uncertainty factor from 1 to 10 when using a lowest-observed-adverse-effect-level (LOAEL) instead of a no-observed-adverse-effect-level (NOAEL). |
| Intermediate uncertainty factor | Other uncertainty factor used, according to scientific judgment, when justified. |

Source: EPA 1985b.

ADIs are generally calculated using the formula:

$$\text{ADI (in mg/kg/day)} = \frac{\text{NOAEL in mg/kg/day}}{\text{Uncertainty Factor}} \qquad (2)$$

AADIs (adjusted ADIs for estimated drinking water intake) used by EPA in the derivation of maximum contaminant limits (MCLS) for drinking water are calculated, with few exceptions, based on exposures to adults. AADIs are calculated by multiplying the ADI by 70 kilograms (kg), the assumed weight for an adult, and dividing by 2 liters per day, the assumed amount of water consumed by an adult per day.

$$\text{AADI} = \frac{\text{(NOAEL) (70 kg)}}{\text{(Uncertainty Factor) (2 liters/day)}} \qquad (3)$$

ADIs and AADIs should not be regarded as providing the exact dividing line between "safe" (below the ADI) and "unsafe" (above the ADI) doses or exposure levels. This conclusion would be equivalent to the interpretation that "risks" abruptly disappear at a specific dose for all members of the human population. In fact, for some chemicals, risks may rise rapidly through and above the ADI, presenting significant risks to humans. For others, doses well above the ADI may fall in the low or zero risk category. Consequently, although ADIs may be used in standards development and risk assessment, they do not represent sharp divisions in the continuum of dose-risk relations (Rodricks and Tardiff, 1984).

Due to the imprecision in the ADI approach, there is currently considerable research designed to quantify a variety of factors contributing to uncertainty thus improving levels of precision in estimating ADIs for specific chemicals. Factors currently subject to investigation include uncertainties related to the slope of dose-response curves, sample size of animals treated, and variability of human responses. However, in the interim period until these approaches can be validated, the current ADI approach remains the method of choice by EPA in the development of drinking water standards.

## L.4 DRINKING WATER STANDARDS AND CRITERIA

Four sets of drinking water standards or criteria are relevant to the evaluation of potential groundwater contamination at Reese Air Force Base:

- EPA enforceable maximum contaminant limits (MCLs), non-mandatory proposed MCLs, or non-mandatory proposed or final recommended MCLs (RMCLs);
- EPA non-mandatory Health Advisories (HAs);
- National Academy of Sciences (NAS) Suggested-No-Adverse-Response Levels (SNARLS); and
- EPA recommended ambient water quality criteria for the protection of human health.

This section discusses each of these in turn, followed by a summary table of the values for each of the chemicals of concern.

Depending upon the stage of rulemaking, EPA may have issued final MCLs, proposed MCLs, final RMCLs or proposed RMCLs for an individual chemical. Proposed and final RMCLs are nonenforceable health goals issued during the first stages of rulemaking. Proposed and final RMCLs are set at 0 for substances evaluated as probable human carcinogens (Group A or B) according to EPA weight-of-evidence carcinogenicity criteria. For chemicals falling in other categories, RMCLs are set based upon chronic toxicity, or in the absence of suitable chronic data, non-chronic data using the ADI threshold-based approach reviewed in the previous section. Proposed and final MCLs are established as close to RMCLs as feasible taking into account cost, availability of treatment technology, and analytical methods (EPA 1985b).

The second, EPA drinking water Health Advisories (HAs), have been developed from data describing noncarcinogenic end points of toxicity, using the AADI approach described in Section L.2. They do not incorporate quantitatively any potential carcinogenic risk from exposure. Consequently, for chemicals classified as carcinogens, the HAs should be applied only to assess non-chronic toxicity end points with the

understanding that carcinogenicity must be addressed separately. HAs for adults are developed using the ADI approach assuming a standard 70 kilogram weight and drinking water consumption of 2 liters per day. Derivation HAs for children assume a standard 10 kilogram weight and 1 liter per day drinking water consumption. For those chemicals which are classified as human or probable human carcinogens based upon carcinogen risk assessment Agency weight-of-evidence carcinogenicity criteria, non-zero one-day, ten-day, and longer-term HAs may be derived, with attendant caveats. However, EPA has not developed and does not recommend using HAs for lifetime (chronic) exposures to carcinogens.

The third, NAS SNARLs are based on noncarcinogenic end points based upon the ADI approach described in Section L.2. SNARLs may be set for any exposure duration. Typically, NAS has developed one-day, seven-day or chronic SNARLs.

The final set, EPA ambient water quality criteria, have been derived, as appropriate, for carcinogenic or noncarcinogenic end points. For noncarcinogens criteria have been based upon the ADI approach. EPA developed the criteria for carcinogens using linear or linearized multistage models to estimate drinking water levels corresponding to excess lifetime cancer risk estimates derived assuming lifetime consumption of drinking water (2l/day) and aquatic species (6.5 g fish and shellfish per day) taken from waters containing the corresponding contaminant concentration. For the most part, these ambient water quality criteria were developed prior to and published in 1980 (EPA 1980). In the intervening years, EPA has revised its conclusions not only qualitatively as to the hazards presented, but also quantitatively as to the risks associated with chemical exposures and requisite levels of protection. Consequently, they should only be used where not superseded by drinking water standards, or by EPA health advisories.

Table L-4 summarizes the drinking water standards and criteria for the chemical contaminants of potential concern.

Table L-4

DRINKING WATER STANDARDS AND CRITERIA (ug/L)

| Chemical | EPA Drinking Water Standards | | | | EPA Health Advisories | | | | EPA Ambient Water Quality Criteria | |
|---|---|---|---|---|---|---|---|---|---|---|
| | MCL | PMCL | RMCL | PRMCL | 1-Day | 10-Day | Longer Term | Lifetime | Non Cancer | Cancer |
| Arsenic | 50 | -- | -- | 50 | 50 | 50 | 50 | 50 | -- | 2.2 ng/L |
| Cadmium | 10 | -- | -- | 5 | 43 (child) 150 (adult) | 8 (child) 29 (adult) | -- | 5 | -- | -- |
| Chromium | 50 | -- | -- | 120 | -- | 1,400 (child) 5,000 (adult) | 240 (child) 840 (adult) | 120 | 50 [Cr(VI)] 170,000 [CR(III)] | -- -- |
| Cyanides | -- | -- | -- | -- | 220 (child) | 220 (child) | 750 (adult) | 750 | -- | -- |
| Copper | 1,000 (secondary standard) | -- | -- | 1,300 | 1,300 (child) 1,300 (adult) | -- | -- | -- -- | 1,000 | -- |
| Dichlorobenzenes | | | | | | | | | | |
| o-Dichlorobenzene (1,2-Dichlorobenzene) | -- | -- | -- | 620 | -- -- | -- -- | 8,930 (child) 31,250 (adult) | 620 | 400 (total all isomers) | -- |
| m-Dichlorobenzene (1,3-Dichlorobenzene) | -- | -- | -- | -- | -- -- | -- -- | 10,700 (child) 37,750 (adult) | 750 | 400 (total all isomers) | -- |
| p-Dichlorobenzene (1,4-Dichlorobenzene) | -- | 750 | 750 | -- | -- | -- | 740 (child) 2,600 (adult) | -- | 400 (total all isomers) | -- |

Table L-4 (Cont.)

| Chemical | EPA Drinking Water Standards | | | | EPA Health Advisories | | | | EPA Ambient Water Quality Criteria | |
|---|---|---|---|---|---|---|---|---|---|---|
| | MCL | PMCL | RMCL | PRMCL | 1-Day | 10-Day | Longer Term | Lifetime | Non Cancer | Cancer |
| Dichloromethane (Methylene Chloride) | -- | -- | -- | -- | 13,300 (child) | 1,500 (child) | -- | 350 | -- | -- |
| Lead | 50 | -- | -- | 20 | -- | -- | -- | 20 | 50 | -- |
| Tetrachloroethene | -- | -- | -- | -- | -- | 34,000 (child) | 1,940 (child) | 680 | -- | 0.8 |
| | | | | | -- | -- | 6,800 (adult) | | | |
| Toluene | -- | -- | -- | 2,600 | 18,000 (child) | 6,000 (child) | -- | 2,000 | 14,300 | -- |
| | | | | | 63,000 (adult) | 21,000 (adult) | -- | | | |
| 1,1,1-Trichloroethene | -- | 200 | 200 | -- | 14,000 (child) | -- | 35,000 (child) | 200 | 18,700 | -- |
| | | | | | -- | -- | 125,000 (adult) | | | |
| Trichloroethene | -- | 5 | 0 | -- | -- | -- | -- | 260 | 6,770 | -- |
| Zinc | 5 mg/L (secondary standard) | -- | -- | -- | -- | -- | -- | -- | -- | -- |

# APPENDIX M

# TOXICOLOGICAL PROFILES FOR POTENTIAL CONTAMINANTS OF CONCERN IN GROUNDWATER AND SURFACE WATER

## M.1 ARSENIC

### Noncarcinogenic Effects

At high doses, arsenic compounds have been shown to produce acute and chronic toxic effects which include irreversible systemic damage. The trivalent compounds are the most toxic and tend to accumulate in the body. Chronic animal studies have shown that arsenic exposure may cause body weight changes, decreased blood hemoglobin, liver damage, and kidney damage.

There is evidence that arsenic is an essential element enhancing growth and development in certain animal species, and it has been suggested that arsenic may be an essential element for humans (NAS 1980).

Whether arsenic is an essential element, is the subject of continuing research. Teratogenic effects of arsenic compounds at relatively high exposure levels have been demonstrated in a number of animal species (EPA 1984). Generally, these effects have been observed following parenteral (injection) administration; whereas, administration at lower doses by the more relevant oral route has not resulted in any significant reproductive or developmental effects.

### Mutagenicity and Carcinogenicity

Arsenic has been shown to be mutagenic in several assay systems and to induce chromosomal aberrations in vivo and in vitro. Animal carcinogenicity studies have reported conflicting results. Several studies have reported an increased incidence of bronchiogenic carcinomas in rats exposed intratracheally to an arsenic-containing pesticide. Reasons for the inconsistent findings in animals may include incorrect selection of animal models and use of flawed study designs. In humans, epidemiologic studies and case reports have reported that arsenic is associated with tumors of the skin, lungs, genital organs, and visual organs (EPA 1984b, EPA 1985c).

EPA has classified arsenic in Group A, i.e., a human carcinogen, based on extensive evidence of human carcinogenicity through inhalation and ingestion exposure (EPA 1985c).

## Drinking Water Standards and Criteria

- Standards. The current MCL for arsenic under the National Interim Drinking Water Regulations is 50 ug/l. The NAS Drinking Water Committee has analyzed the toxicology of arsenic (NAS 1983). Based upon this evaluation, NAS recommended the retention of the MCL pending resolution of the question whether arsenic is an essential element in the human diet.

  NAS also examined the available epidemiologic studies which were designed to investigate the relationship between arsenic exposure and skin cancer in the United States. The conclusion of the report was that these studies lacked statistical power to determine if arsenic causes skin cancer. However, the report stated that precursors of skin cancer, normally seen in cases of arsenic-induced skin cancer, were not seen in these studies.

  Based upon the recommendations of NAS, EPA has proposed that the RMCL remain at the current MCL of 50 ug/l. In its determination, EPA stated that the level was below concentrations at which noncarcinogenic toxicity had been demonstrated and was in the range which might be essential for humans (EPA 1985c).

- Criteria. Based upon recommendations of NAS, EPA has proposed that all health advisories for arsenic be set at 50 ug/l (EPA 1985d). NAS has not developed SNARLs for arsenic. The EPA ambient water quality criteria for the protection of human health is 22 ng/l, corresponding to $1 \times 10^{-5}$ lifetime excess cancer risk calculated on the basis of an epidemiological study of skin cancer among Taiwanese exposed via drinking water (EPA 1980).

## M.2 CADMIUM

### Non-Carcinogenic Effects

Acute and chronic exposure to cadmium in animals and humans results in renal dysfunction, hypertension, anemia, and altered liver microsomal activity. The kidney is considered to be the critical target organ in humans chronically exposed to cadmium by ingestion. The early clinical signs of renal injury include proteinuria, glucosuria, and aminoaciduria.

To calculate an adjusted AADI, EPA used renal dysfunction as an end point, and the most widely accepted estimate for the critical (threshold) concentration of cadmium in the renal cortex, 200 ug/g. Using 4.5% absorption of the daily dose and 0.01% excretion in the total body burden per day, EPA calculated a LOAEL of 352 ug/day for renal effects in humans. Incorporating an uncertainty factor of 10, EPA has developed an acceptable daily intake (ADI) of 35 ug/day. Adjusting the ADI for consumption of 2 liters of water per day, EPA derived a provisional AADI of 18 ug/l (EPA 1985c).

Embryotoxic and teratogenic effects have been demonstrated in many mammalian species following parenteral administration of high doses of cadmium. In contrast, there is little evidence of these effects at lower doses by either of the more relevant inhalation or oral exposure routes (EPA 1981).

### Carcinogenicity and Mutagenicity

Cadmium chloride aerosol administered by inhalation for 18 months produced lung tumors in rats. In contrast, all cancer bioassays in which cadmium has been administered orally have been negative. Recent epidemiological studies indicated that workers chronically exposed to cadmium are at risk of elevated lung cancer mortality. According to its weight-of-evidence carcinogenicity criteria, EPA has classified cadmium in Group B1 (probable human carcinogen) based on the epidemiological data (EPA 1985c).

While the Agency has concluded that cadmium is a carcinogen by the inhalation route, EPA has proposed that the MCL for cadmium not be set based on carcinogenicity, based upon the negative cancer bioassays in which cadmium was administered orally (EPA 1985c).

## Drinking Water Standards and Criteria

- Standards. The current MCL for cadmium, under the National Interim Primary Drinking Water Regulations, is 10 ug/l. This level was designed to prevent renal dysfunction, and was based on a critical value of cadmium in the kidney cortex of 200 ug/g, and assumptions on gastrointestinal absorption, excretion of the absorbed dose, daily excretion of the total body burden, and daily dietary cadmium intakes.

  The World Health Organization (WHO) guideline for drinking water is 5 ug/l. This value was based on a value for provisional tolerable weekly cadmium intake, assuming that 25% of the total cadmium intake was attributable to drinking water. EPA has proposed a RMCL of 5 ug/l based upon the WHO guidelines and the NAS SNARL.

- Criteria. Based on a NOAEL reported in a study of 43 ug/kg/day for emetic effects reported in a study of acute exposure in adult humans, EPA derived 1-day drinking water HAs of 43 ug/l (10-kg child) and 150 ug/l (70-kg adult) (EPA 1985d). These HAs were derived using an uncertainty factor of 10, based on consumption of 1 liter and 2 liters of water per day for a child and adult, respectively.

  Ten-day HAs of 8 ug/l (10-kg child) and 29 ug/l (70-kg adult) were calculated based on a NOAEL reported in a chronic 24-week feeding study in rats. In deriving the 10-day HAs, EPA used a NOAEL of 80 ug/kg/day, based on proteinuria, and an uncertainty factor of 1,000.

  The lifetime and longer-term HAS for a 70-kg adult, equivalent to the proposed RMCL, are 5 ug/l (EPA 1985d).

  The NAS has calculated a chronic SNARL of 5 ug/l using renal dysfunction as an end point, based on a 24-week-feeding study in rats (NAS 1982). This level was derived from the NAS and

WHO guidelines of 5 ug/l by allocating 25% of total human cadmium intake to drinking water (EPA 1985c).

The EPA ambient water quality criterion for the protection of human health for cadmium is 10 ug/l, considering ingestion of water and contaminated aquatic organisms (EPA 1980).

## M.3 CHROMIUM

### Noncarcinogenic Effects

There are two chromium valences of principal concern in drinking water - trivalent [Cr(III)] and hexavalent [Cr(VI)] chromium. Cr(VI) is much more toxic than Cr(III) and has been shown to produce liver and kidney damage, internal hemorrhage, and respiratory disorders. EPA has developed an adjusted acceptable daily intake for total chromium based upon effects of Cr(VI) for the following three reasons (EPA 1985c):

(1) The two valences are in dynamic equilibrium in aqueous media;

(2) An AADI based upon the more toxic [Cr(VI)] of the two valences will be conservative (health protective); and

(3) Reduction of Cr(VI) to Cr(III) in the stomach following oral intake is incomplete, and relative to Cr(III), there is greater Cr(VI) absorption and tissue accumulation.

EPA derived the provisional AADI for total chromium based upon a NOAEL reported in a study in which rats were exposed to Cr(VI) in drinking water for one year. Based upon a NOAEL of 2.41 mg/kg/day, an uncertainty factor of 500, and standard intake and physiological assumptions, the Agency derived an AADI of 170 ug/l (EPA 1985c).

### Carcinogenicity and Mutagenicity

Based upon positive epidemiological studies demonstrating excess cancer mortality among Cr(VI)-exposed workers and positive animal

studies, EPA has classified Cr(VI) in Group A - sufficient evidence of carcinogenicity in humans and animals (EPA 1985c). However, since chromium has not been shown to be carcinogenic by the oral route, the Agency has proposed that chromium in drinking water be regulated based upon noncarcinogenic chronic toxicity data (EPA 1985c).

Cr(VI) has demonstrated consistently positive mutagenic activity in a number of bacterial systems. Both Cr(III) and Cr(VI) have been shown to interact with DNA in bacterial assays. Cr(VI) has inhibited DNA synthesis and increased unscheduled DNA synthesis in mammalian cells in culture. Both valences have been demonstrated to produce clastogenic effects in mammalian cells. Increased frequencies of chromosomal aberrations have also been observed in occupationally exposed workers.

## Drinking Water Standards and Criteria

### Standards

The current MCL for chromium in drinking water is 50 ug/l. Based upon the AADI of 170 ug/l derived on the basis of chronic noncarcinogenic toxicological end points in animals, EPA has derived a proposed RMCL of 120 ug/l by factoring in data on human exposure (100 ug/day via the diet, 0 ug/day via the air) (EPA 1985c).

### Criteria

In the absence of suitable data, EPA has not derived a 1-day HA for chromium. However, the Agency has derived 10-day and longer-term HAs based upon NOAELs reported in animal toxicity studies, using an uncertainty factor of 100, and various intake assumptions and physiological parameters. The 10-day HA based on a NOAEL of 14.4 mg/kg/day reported in a 60-day study in which rats were exposed via drinking water is 1,400 ug/l and 5,000 ug/l for a 10-kg child and 70-kg adult, respectively. The corresponding longer-term HAs, based on a NOAEL of 2.41 mg/kg/day reported in a chronic study in which rats were exposed via drinking water, are 240 ug/l (child) and 840 ug/l (adult) (EPA 1985d). The lifetime HA of 120 ug/l was derived in the same manner and is equivalent to the proposed RMCL (EPA 1985d).

The EPA national ambient water quality criteria for the protection of human health are 50 ug/l and 170,000 ug/l for Cr(VI) and Cr(III), respectively (EPA 1980).

## M.4 COPPER

### Noncarcinogenic Effects

Copper is toxic at high-dose levels and is an essential element at lower levels. Toxic effects following acute exposure in man and laboratory animals include gastrointestinal disturbances, hemolytic anemia, and liver and kidney damage. Limited data are available on copper's chronic toxicity; however, efficient homeostatic mechanisms generally protect mammals from excess dietary copper (EPA 1985c).

Copper is regarded as an essential element in mammalian nutrition based on its requirement in many enzymatic reactions. Copper deficiency can result in decreased iron absorption and iron deficiency, and may also lead to reproductive abnormalities (NAS 1980).

EPA has developed an AADI based upon a LOAEL of 5.3 mg/day reported in human clinical case studies (EPA 1985c). EPA derived an AADI of 1,300 ug/l from the LOAEL by applying an uncertainty factor of 2, assuming consumption of 2 liters of water per day (EPA 1985c).

### Carcinogenicity and Mutagenicity

Several carcinogenicity studies in animals receiving copper orally have been negative. However, because of methodological deficiencies in these studies, as well as the absence of human data, EPA has classified copper according to weight-of-evidence carcinogenicity criteria in Group D--inadequate data in humans and animals (EPA 1985c).

Copper compounds have generally provided negative results in mutagenesis assays. Copper sulfate was reported to increase the frequency of recessive lethal mutations in Drosophilia melanogaster at high concentrations.

## Drinking Water Standards and Criteria

### Standards

There is currently no primary enforceable EPA drinking water standard for copper. Copper is included in the National Secondary Drinking Water Regulations as a nonenforceable criterion of 1,000 ug/l based upon organoleptic effects (taste and odor). EPA has issued a proposed RMCL of 1,300 ug/l equivalent to the AADI. As the AADI was based on acute effects, the Agency made no adjustments using human exposure data (EPA 1985c).

### Criteria

The EPA has developed a 1-day HA for both adults and children for copper of 1,300 ug/l based upon the same methodology and data used to derive the proposed RMCL (EPA 1985c). In the absence of suitable data, the Agency did not calculate 10-day longer term or lifetime HAs.

NAS has not developed any SNARLs for copper.

EPA ambient water quality criterion for the protection of human health based upon organoleptic effects is 1,000 ug/l (EPA 1980).

## M.5 CYANIDES

### Noncarcinogenic Effects

Cyanides are organic or inorganic compounds that contain the cyanide-moiety (CN). Organic cyanides are referred to as nitriles. Cyanides are readily absorbed from the lungs, gastrointestinal tract, and skin by animals and man. Cyanides exhibit their toxicity by combining with the cellular hemoglobin, resulting in tissue hypoxia.

EPA has calculated a provisional AADI based upon a two-year study in which rats were administered diets containing 0 to 300 mg/kg hydrogen cyanide (EPA 1985c). Using a NOAEL of 10.8 mg/kg/day, an uncertainty factor of 500, and assuming 2 liter drinking liter water consumption, EPA derived an AADI of 750 ug/l for a 70-kg adult and 220 ug/l for a 10-kg child.

Effects on reproduction and development have not been reported at doses below maternally toxic doses.

### Carcinogenicity and Mutagenicity

Potassium cyanide was reported to be not mutagenic in in vitro assays. Cyanide has been classified in EPA's Group D, not classifiable--inadequate human and animal evidence of carcinogenicity (EPA 1985c).

## Drinking Water Standards and Criteria

### Standards

Because they have only been rarely detected, and when they have been detected, it has been at levels greatly below the AADI, EPA has decided not to regulate cyanides in drinking water (EPA 1985c).

### Criteria

EPA has developed a 1-day and 10-day health advisory (HA) of 220 ug/l for a 10-kg child by appropriate modification of the lifetime HA of 750 ug/l for daily drinking water intake (1 liter) and weight (10 kg) (EPA 1985d).

Both the ten-day and lifetime HAs of 750 ug/l for an adult were developed by application of a 500-fold uncertainty factor, and standard intake assumptions and physiological parameters to a NOAEL of 10.8 mg/kg/day reported in a chronic study of rats receiving cyanide in the diet (EPA 1985). EPA has not developed any longer-term HAs for cyanides.

The National Academy of Sciences has not developed any SNARLs for cyanides. EPA has developed an ambient water quality criterion for the protection of human health of 200 ug/l (EPA 1980). In 1985, EPA proposed to revise this level to 3,770 ug/l (EPA 1985p).

## M.6 DICHLOROBENZENES (DCBs)

### Noncarcinogenic Effects

The principal toxic effects of o-dichlorobenzene (1,2-dichlorobenzene, o-DCB) and p-dichlorobenzene (1,4-dichlorobenzene or p-DCB) in humans and other animals from acute and longer-term exposures include central nervous system depression; blood dyscrasias; and lung, kidney and liver damage. Similar data are not available for

m-dichlorobenzene (1,3-dichlorobenzene or m-DCB). However, based upon short-term assays, EPA has determined that short-term health assessments developed for o-DCB should apply to m-DCB.

## Carcinogenicity and Mutagenicity

The few studies available on the carcinogenic potential of the DCBs have been negative. Preliminary results of a National Toxicology Program (NTP) gavage bioassay indicate that o-DCB was not carcinogenic under the conditions of the experiment. Pending receipt of the final NTP report for o-DCB, EPA has categorized all three DCB isomers according to Agency weight-of-evidence carcinogenicity criteria in Group D, not classifiable as to human carcinogenicity (EPA 1985j).

In general, DCBs have shown little or no mutagenic activity in a range of bacterial systems. However, several studies with mold and plant cultures treated with DCBs have reported mutations and chromosomal alterations (EPA 1985k).

## Drinking Water Standards and Criteria

### Standards

EPA is in the process of establishing an enforceable MCL for o-DCB and p-DCB but not m-DCB. As a first step in the process, EPA has issued a proposed recommended MCLs (PRMCL) for o-DCB based upon a NOAEL reported in a subchronic gavage study in mice and rats. Based upon a NOAEL of 125 mg/kg/day, an uncertainty factor of 100, allocation of 20 percent of the total human intake from all exposure sources to drinking water, and various intake and physiological assumptions, EPA has derived a PRMCL for o-DCB of 620 ug/l. EPA has also issued a proposed MCL for p-DCB of 750 ug/l, based upon a NOAEL of 150 mg/kg/day reported in a rat gavage study, an uncertainty factor of 1,000, and standard intake assumptions and physiological parameters (EPA 1984c).

In the absence of sufficient data, EPA has not developed and is not in the process of developing, a drinking water standard for m-DCB.

Criteria

No 1-day or 10-day health advisories (HAs) were derived by EPA for o-DCB, m-DCB, or p-DCB, due to absence of suitable data. The longer-term HA for o-DCB judged by EPA to be applicable to m-DCB, was developed using a NOAEL reported in a subchronic gavage study of o-DCB in rats and mice. Based upon a NOAEL of 125 mg/kg/day, an uncertainty factor of 100, and standard intake assumptions and physiological parameters and assumptions, EPA developed a longer-term HA for o-DCB and m-DCB of 8,930 ug/l (10-kg child) and 31,250 ug/l (70-kg adult) (EPA 1985d). The longer-term HA for p-DCB was derived from a NOAEL of 150 mg/kg/day reported in a subchronic gavage study. Based on this NOAEL, an uncertainty factor of 100 and standard EPA assumptions and physiological parameters, EPA derived longer-term HAs for p-DCB of 10,700 ug/l (child) and 37,500 ug/l (adult).

The EPA lifetime HA for o-DCB of 620 ug/l was derived in the same manner and is equivalent to the PRMCL. However, due to the absence of suitable data, the Agency has not developed a lifetime HA for m-DCB.

The lifetime HA for p-DCB was derived based upon a NOAEL in the NTP subchronic study. Using a NOAEL of 150 mg/kg/day, a 10,000-fold uncertainty factor and standard EPA assumptions and physiological parameters, the EPA derived a lifetime HA for p-DCB of 750 ug/l (EPA 1985d).

NAS has developed chronic SNARLs of 300 ug/l and 94 ug/l for o-DCB and p-DCB, respectively (NAS 1977, 1983).

The EPA ambient water quality criterion for the protection of human health applicable to an individual DCB isomer or the sum total of all three DCB isomers is 400 ug/l (EPA 1980).

## M.7 DICHLOROMETHANE (METHYLENE CHLORIDE or DCM)

Studies in humans and animals of dichloromethane (DCM) have largely been limited to the inhalation route. Mild exposures result in central nervous system (CNS) disturbances, followed by rapid and complete recovery. Following more severe exposure, greater disturbances to the CNS and peripheral nervous system occur. DCM can be cardiotoxic to the heart, causing arrhythmias following acute exposure. Following intake, DCM is metabolized to carbon monoxide, resulting in decreased oxygen transport to cells via the blood, resulting in tissue hypoxia.

## Carcinogenicity and Mutagenicity

DCM has been shown to be carcinogenic in male and female mice (EPA 1985f). In addition, there is some evidence of carcinogenicity in male rats (EPA 1985f). No elevated cancer risks have been demonstrated in humans in epidemiological studies; however, EPA has judged these studies to be methodologically inadequate to detect cancer in man (EPA 1985f). Based upon EPA weight-of-evidence carcinogenicity criteria, EPA has placed DCM in category $B_2$ - probable human carcinogen.

DCM *in vitro* mutagenicity assays have been positive in four different systems (EPA 1985e). Based upon weight-of-evidence criteria, EPA judged DCM to be a mutagen with the potential for inducing gene mutations in exposed human cells (EPA 1985e). In addition, the Agency concluded a positive response in cultured mammalian cells indicates that DCM may also cause chromosomal aberrations, but additional studies would be required to confirm these data (EPA 1985f).

## Drinking Water Standards and Criteria

### Standards

EPA has not established an MCL for DCM, and has not, as yet, initiated rule making to establish an MCL.

### Criteria

EPA has derived a 1-day health advisory (HA) for dichloromethane in drinking water based on an acute toxicity study in which rats were exposed by gavage. Using a LOAEL of 1,326 mg/kg/day, an uncertainty factor of 1,000 and standard intake assumptions and physiological parameters, EPA developed a 1-day HA of 13,300 ug/l for a 10-kg child (EPA 1985d).

Based upon a NOAEL reported in a 13-week oral rat study, EPA derived a 10-day HA for a 10-kg child. The 10-day HA of 1,500 ug/l was derived by application of a 100-fold uncertainty factor along with standard intake assumptions to a NOAEL of 15 mg/kg/day (EPA 1985d).

In the absence of appropriate data, EPA did not derive a longer-term HA. However, EPA did calculate a lifetime HA based upon a NOAEL reported in a chronic study in which rats received DCM in drinking

water. Based upon a NOAEL of 5 mg/kg/day, a 100-fold uncertainty factor and standard intake assumptions, EPA derived a lifetime HA for noncarcinogenic effects of 1,750 ug/l (EPA 1985d).

NAS has not developed SNARLs for DCM.

EPA has developed a national ambient water quality criterion for protection of human health based on noncarcinogenic effects of 13,400 ug/l (EPA 1980).

## M.8 LEAD

### Non-Carcinogenic Effects

When toxicity information is considered for non-carcinogenic effects of substances, the data are evaluated based on their dose-related response characteristics and the establishment of an exposure level below which no adverse effects are observed. Historically, the observed threshold or no-effect level for lead-induced toxic effects has continued to decline as more sophisticated experimental and clinical measures are employed to detect more subtle effects. These include alterations in physiological functions at PbB levels below the currently accepted maximum safe level for exposure to children, a segment of the population currently regarded to be at highest risk of lead-induced effects (EPA 1985c).

The most serious effects associated with markedly elevated PbB levels are severe neurotoxic effects that include irreversible brain damage. For most adults, such damage does not occur until PbB levels exceed 100 to 120 micrograms per deciliter (ug/dl). At these PbB levels, severe gastrointestinal symptoms and effects on several other organ systems are often found. Precise thresholds for occurrence of overt neurological and gastrointestinal signs and symptoms of lead exposure in cases of subencephalopathic lead intoxication have yet to be established, but such effects have been observed in chronically exposed adult lead workers at PbB levels as low as 40 to 50 ug/dl.

Toward the lower range of PbB levels associated with overt lead intoxication, less severe but important signs of impairment in normal physiological functioning in several organ systems are evident among apparently asymptomatic lead-exposed adults (EPA 1985c). These include:

- Slowed nerve conduction velocities indicative of peripheral nerve dysfunction (at PbB levels as low as 30 to 40 ug/dl);

- Altered testicular function (at PbB levels of 40 to 50 ug/dl); and

- Reduced hemoglobin production (at approximately 50 ug/dl).

EPA has concluded that all of the above effects point toward a generalized impairment of normal physiological functioning of several different organ systems as adult PbB levels exceed 30 to 40 ug/dl. Evidence of impaired heme synthesis effects in blood occur at even lower levels.

More recent research has indicated that there is a relationship between PbB levels and increases in blood pressure. Preliminary review of this work indicates a statistically significant correlation between PbB levels and diastolic blood pressure in white males, ages 40 to 50, with no threshold apparent in the range of 6 to 30 ug/dl. Of particular concern is the finding of a 2 mm Hg increase in diastolic pressure per incremental PbB level increase of 0.5 ug/dl. Possible increases in risk of more severe medical events (stroke, heart attack, death) associated with lead-induced increases in blood pressure are also estimated in one of the recently published studies.

Children represent a sensitive subpopulation with regard to lead toxicity. As with adults, lead affects many different organ systems and biochemical/physiological processes across a wide range of exposure levels. Effective PbB levels for producing encephalopathy or death in children are lower than in adults, starting at approximately 80 to 100 ug/dl. Permanent mental retardation and other marked neurological deficits are among lasting neurological sequelae typically seen in cases of nonfatal childhood lead encephalopathy. Other overt neurological signs and symptoms of subencephalopathic lead intoxication, such as peripheral neuropathies (functional and/or pathological changes in the peripheral nervous system), have been detected in some children at PbB levels as low as 40 to 60 ug/dl. Chronic kidney disease is not evident at PbB levels above 100 ug/dl. Moreover, colic and other overt gastrointestinal symptoms occur in children, at least

down to 60 ug/dl. Frank anemia is also evident at 70 ug/dl, representing an extreme manifestation of reduced hemoglobin synthesis at PbB levels as low as 40 ug/dl. All these effects are widely accepted as adverse health effects, and are reflective of widespread marked impact of lead on the normal physiological functioning of many different organ systems (EPA 1984e, 1985c).

Additional studies demonstrate further important health effects occurring in non-overtly lead-intoxicated children at similar or lower PbB levels than those indicated above. Among the most important and controversial of these electrophysiological and neuropsychological effects are indications of peripheral nerve dysfunction, indexed by slowed nerve conduction velocities (NCV) found in children with PbB levels lower than 30 ug/dl. EPA has concluded that while none of these studies on central nervous system (CNS) effects can individually be regarded as conclusively proving significant cognitive (IQ) or behavioral effects occurring below 30 ug/dl, they clearly indicate likely associations between neuropsychologic deficits and PbB levels as low as 30 to 50 ug/dl. The magnitude of average observed IQ deficits is approximately 5 points at mean PbB levels of 50 to 70 ug/dl and about 4 points at mean levels of 30 to 50 ug/dl. Whether a smaller risk exists at somewhat lower levels (15 to 30 ug/dl) cannot be determined at this time (EPA 1984e, 1985c).

Many different impacts (representing potentially impaired functioning and depleted reserve capacities of many different tissues and organs) have been noted at PbB levels below 30 ug/dl.

At PbB levels around 10 to 15 ug/dl, initial signs of detectable heme synthesis impairment occur in many different organic systems, indications of increasing degrees of pyrimidine metabolism interference, signs of altered nervous system activity, and interference in vitamin-D metabolism. EPA has stated that, on the basis of these data, these effects might be viewed as becoming sufficiently adverse to warrant avoidance as PbB levels exceed 20 to 25 ug/dl (EPA 1985c).

Reproduction and Development

There is a paucity of exposure data on which to evaluate the effects of lead on reproduction and development in humans. Early studies of pregnant women exposed to high levels of lead indicated

toxic, but not teratogenic, effects on the conceptus. One recently reported study hints at birth anomalies possibly associated with exposure to low lead levels (mean cord blood level of 15 ug/dl) among women in the general population. However, the significance of these studies has been questioned because of the absence of reported statistically significant associations between cord blood levels and specific types of minor anomalies or any major anomalies. There are also no reliable data pointing to adverse effects in human offspring following lead exposure to fathers.

EPA has concluded that the current collective human data regarding lead's effects on reproduction on in utero development are insufficient for accurate estimation of exposure-effect or no-effect levels (EPA 1984c). In the absence of sufficient data, it has been suggested that it would be prudent to avoid lead exposures resulting in PbB levels exceeding 25 to 30 ug/dl to pregnant women and women of childbearing age in general. This conclusion was based on the known equilibration between maternal and fetal blood lead concentrations and growing evidence of deleterious effects in young children as PbB levels approach 25 to 30 ug/dl. Industrial lead exposure of men with PbB levels of 40 to 50 ug/dl also appears to result in altered testicular function.

Carcinogenicity

Several studies have reported renal tumors in Wistar rats following ingestion of high doses of a lead salt (lead acetate). Lead subacetate (another lead salt) has produced benign tumors (renal carcinomas or adenomas) in Swiss mice and several strains of rats, but not golden hamsters. Gliomas (central nervous system tumors) were also observed in many of these studies.

There have been a number of epidemiological studies which have assessed the mortality experience of lead-exposed workers. In some of the studies, no excess cancer mortality was observed. In one study, non-statistically significant excess cancer mortality of the respiratory system and cancer of the digestive organs and peritoneum was reported, which on evaluation by other statistical techniques by another investigator was reported to achieve statistical significance. Another study has reported increased mortality from renal cancer among

a group of lead smelting workers. However, this excess mortality, based on only six cases, did not achieve statistical significance. On review of all of these studies, EPA concluded that the absence of good lead exposure documentation made it difficult to assess the contribution of lead to the observed results.

The International Agency for Research on Cancer (IARC) has classified lead in Group 3, inadequate evidence for carcinogenicity in humans, sufficient evidence for carcinogenicity in animals (for some salts). EPA has classified lead in category $B_2$ (sufficient evidence in animals, insufficient evidence in humans) according to the Agency's Guidelines for Carcinogen Risk Assessment (51 FR 33992-34003, September 24, 1986). However, the agency noted that the doses inducing kidney tumors in positive rat studies were beyond the human lethal dose, and several epidemiological studies have not demonstrated an association between lead exposure and elevated cancer mortality in occupationally exposed workers. Consequently, EPA has recently proposed to set an RMCL in drinking water based on non-carcinogenic endpoints.

## Drinking Water Standards and Criteria

### Standards

The current MCL for lead under the National Interim Primary Drinking Water Regulations is 50 ug/l. This limit was designed to limit PbB levels in 99.5% of the population of below 30 micrograms per deciliter (ug/dl).

NAS (1984) has stated that the current MCL, in view of other environmental sources of exposure, may not provide a sufficient margin of safety, particularly for fetuses and young children.

EPA, in agreement with this assessment, has recently taken the first step in lowering the MCL by issuing a proposal that would establish an RMCL based on human health of 20 ug/l. This level was derived based on a target PbB level of 15 to 20 ug/dl for protecting children and infants, using a conversion factor of 6.25 to translate PbB to lead in drinking water (assuming a consumption of 1 liter of water per day) and an uncertainty factor of 5 (EPA 1985c). After finalization of the RMCL, EPA would then factor in other data, such as technological feasibility, to establish a revised MCL.

Criteria

EPA has not developed 1-day, 10-day or longer-term HAs for lead. The lifetime HA of 20 ug/l is equivalent to, and was derived in the same manner as, the proposed RMCL (EPA 1985d).

NAS has not developed SNARLs for lead.

The EPA ambient water quality criterion for the protection of human health is 50 ug/l (EPA 1980).

## M.9 TETRACHLOROETHYLENE (PERCHLOROETHYLENE or PERC)

Noncarcinogenic Effects

The principal toxic effects following acute exposure in animals to tetrachloroethylene (PERC) are depression of the central nervous system (CNS), ataxia (failure of muscular coordination), and respiratory cardiac arrest. Subchronic and chronic effects in animals include damage to the liver and kidney effects. In humans, the principal effects are CNS depression and liver toxicity.

Carcinogenicity and Mutagenicity

A 1977 National Cancer Institute bioassay in which PERC was administered by gavage reported increased incidence of liver tumors in mice but not rats (EPA 1985d). A draft report of a National Toxicology Program (NTP) inhalation bioassay, currently under internal review, has noted an increased incidence of tumors in mice and rats. Although EPA has previously categorized tetrachloroethylene in Group $B_2$-probable human carcinogen (EPA 1985b, 1985h), the Agency is awaiting final results of the NTP bioassay before commencing a rule making for the chemical in drinking water.

PERC has been evaluated for its ability to cause gene mutation, chromosomal aberrations, unscheduled DNA synthesis, and mitotic recombination. In general, these responses have been weak and were observed at high concentrations that were cytotoxic (EPA 1985h). Additionally, no dose-dependent relationships were demonstrated in these studies (EPA 1985h).

## Drinking Water Standards and Criteria

### Standards

EPA has not established an MCL for PERC in drinking water. The agency is scheduled to begin rule making to establish a MCL in the near future.

### Criteria

In the absence of suitable data, EPA has not derived a 1-day health advisory (HA) for PERC. EPA derived a 10-day HA based upon a LOAEL of 70 mg/m$^3$ reported in a study of humans following inhalation for 7 hours per day for 5 consecutive days. Using the LOAEL, an uncertainty factor of 1,000, and various intake and physiological assumptions, EPA derived a 10-day HA for a 10-kg child of 34,000 ug/l.

Using a NOAEL of 475 mg/m$^3$ reported in a subchronic inhalation study in rats, a 100-fold safety factor and standard assumptions, EPA derived longer-term HAs of 1,940 ug/l (child) and 6,800 ug/l (adult). Using a similar methodology, EPA derived a lifetime noncarcinogenic HA of 680 ug/l for 70-kg adult based on a NOAEL of 475 mg/m$^3$ reported in a chronic rat inhalation study (EPA 1985d).

As noted by EPA, the lifetime HA applies to noncarcinogenic effects only, and would correspond to significant estimated lifetime cancer risks (EPA 1985d).

NAS has calculated 1-day and 10-day SNARLs for noncarcinogenic effects of 172,000 ug/l and 24,500 ug/l, respectively (NAS 1980).

The EPA ambient water quality criterion for the protection of human health corresponding to an one-in-a-million incremental lifetime excess risk estimated on the basis of animal data is 0.8 ug/l (EPA 1980).

## M.10 TOLUENE

### Noncarcinogenic Effects

Acute or chronic exposure to high levels of toluene in animals results in central nervous system depression and effects on the lungs, liver, and kidney.

EPA has derived an AADI for drinking water consumption based upon a 24-month inhalation study in rats (EPA 1985). Based upon a NOAEL of 1,130 mg/m$^3$, an uncertainty factor of 100, and assuming 50 percent pulmonary absorption, EPA derived an AADI of 10,100 ug/l (EPA 1985c).

### Carcinogenicity and Mutagenicity

Only one long-term carcinogenicity bioassay of toluene has been reported. This study concluded that toluene was not carcinogenic following inhalation in rats. The National Toxicology Program is conducting 2-year carcinogenicity studies in which toluene is being administered by inhalation and gavage to rats and mice. In addition, carcinogenicity studies by European investigators are expected to be published in the next few years. According to weight-of-evidence carcinogenicity criteria, EPA has classified toluene in Category D, not classifiable as to human carcinogenicity (EPA 1985c).

Toluene has not been shown to be mutagenic in *in vivo* or *in vitro* assays.

## Drinking Water Standards and Criteria

### Standards

In the first stage of rule making designed to establish an MCL for toluene in drinking water, EPA has issued a proposed RMCL of 2,600 ug/l derived from the AADI of 10,100 ug/l by allocating a 20 percent drinking water contribution to total intake from all sources of exposure (EPA 1985c). Subsequent to finalization of the RMCL, EPA will evaluate analytical feasibility and feasibility of control in establishing an enforceable MCL.

### Criteria

In the absence of adequate dose-response data for oral exposure to toluene, EPA derived a 1-day health advisory (HA), based on NOAEL of 377 mg/m$^3$ reported in studies of humans, the subjects of single inhalation exposures for up to 8 hours. Based upon the NOAEL, an uncertainty factor of 100, and a variety of physiological parameters and intake assumptions, EPA derived 1-day HAs of 18,000 ug/l and 63,000 ug/l for a 10-kg child and 70-kg adult, respectively (EPA 1985a).

In the absence of sufficient data, EPA derived 10-day HAs of 6,000 ug/l (child) and 21,000 ug/l (adult), by applying an uncertainty factor of 3 to the 1-day HA. The Agency utilized a three-fold rather than the usual 10-fold uncertainty factor because toluene is rapidly distributed and excreted and because the chemical presents little bioaccumulation potential relative to typical toxicants (EPA 1985d).

The EPA ambient water quality criterion for the protection of human health is 14,300 ug/l (EPA 1980).

## M.11 1,1,1-TRICHLOROETHANE (TCA)

### Noncarcinogenic Effects

The principal noncarcinogenic effects of 1,1,1-trichloroethane (TCA) following exposure in animals and man are depression of the central nervous system, increase in liver weight and cardiovascular changes. Current data do not suggest that TCA is reproductive of developmental toxin.

EPA has developed a risk reference dose (RRfD) of 0.35 mg/kg/day based upon a NOAEL of 1,365 $mg/m^3$ reported in a study in which mice were exposed by inhalation for 14 weeks. EPA derived the RRfD by application of an uncertainty factor of 100, and a 30% absorbed dose and standard physiological parameters (EPA 1985d).

### Carginogenecity and Mutagenicity

There have been two TCA carcinogenicity bioassays. The first, conducted by the National Cancer Institute (NCI), was judged to be inadequate due to poor survival in treated animals. Preliminary results of the second, by the National Toxicology Program, showed elevated incidences of hepatocellular carcinomas. These initial results have been questioned and the study is currently being audited (EPA 1985b). Based upon these results, EPA has classified TCA according to weight-of- evidence criteria in group D, Not Classifiable--inadequate human and animal evidence of carcinogenicity (EPA 1985b).

## Drinking Water Standards and Criteria

### Standards

Currently, there is no MCL for TCA in drinking water. In the first phase of a regulatory program to establish an MCL, EPA has issued a final RMCL of 200 ug/l (EPA 1985b). The RMCL was derived from the RRfD of 35 mg/kg/day by application of standard weight (70 kg), drinking water intakes (2 l/day), and allocation of 20% of total daily intake to drinking water intake (EPA 1980).

### Criteria

EPA has developed a 1-day health advisory (HA) based upon a LOEL of 1.4 g/kg/day reported in a study of rats receiving a single oral dose of TCA. Based upon the LOEL, and standard weight and intake assumptions, EPA derived a 1-day HA of 14,000 ug/l for a 10-kg child (EPA 1984d). In the absence of sufficient data, EPA has not developed a 10-day HA. EPA has developed longer-term HAs of 35,000 ug/l (child) and 125,000 ug/l (adult), based upon a NOAEL of 0.5 g/kg/day reported in a study in rats receiving TCA by gavage for 12 weeks (EPA 1985d).

The EPA lifetime HA of 200 ug/l is equivalent to and was derived by the same methodology as the RMCL (EPA 1985d).

NAS has developed 1-day, 7-day and chronic SNARLs for TCA of 490,000 ug/l, 70,000 ug/l, and 3,000 ug/l, respectively (NAS 1980).

The EPA ambient water quality criterion for TCA for the protection of human health is 18,700 ug/l (EPA 1980).

## M.12 TRICHLOROETHYLENE (TCE)

### Noncarcinogenic Effects

The principal toxicological effect of concern for trichloroethylene (TCE) is carcinogenicity. Noncarcinogenic effects include central nervous system disturbances, kidney and liver damage following exposure to relatively high airborne concentrations.

### Carcinogenicity and Mutagenicity

Six studies of the carcinogenicity of TCE in animals have been published. Two have reported significant increases in liver tumors in

mice. EPA has judged three others as technically flawed. A sixth reported that TCE containing epichlorohydrin and epoxybutane was carcinogenic in a less responsive mouse strain, but pure TCE was not (EPA 1985b). Recognizing the lower responsiveness of the mice in the latter study, EPA has classified TCE based upon weight-of-evidence carcinogenicity guidelines in category B2 - probable human carcinogen.

Commercial trichloroethylene containing stabilizers has been reported to be weakly mutagenic in a variety of in vitro and in vivo assays representing a wide evolutionary range of organisms (EPA 1985g). Based on these data, EPA has concluded that commercial trichloroethylene may have the potential to cause weak or borderline increases above the spontaneous level of mutagenic effects in exposed human tissues (EPA 1985g).

## Drinking Water Standards and Criteria

### Standards

EPA is currently conducting a rule making to establish an MCL for TCE in drinking water (EPA 1985b). As a first step in the rule making, EPA has established an RMCL of 0 based upon the Agency's determination that no level of exposure above 0 is an acceptable health goal for a carcinogen. Based upon analytical feasibility and control considerations, EPA has issued a proposed MCL of 5 ug/l. Subsequent to review of the rule making record, EPA will establish an enforceable MCL.

### Criteria

In the absence of suitable data, EPA has not developed 1-day, 10-day, or longer-term health advisories (HAs) for TCE (EPA 1985d). Based upon a LOAEL reported in a 14-week rat inhalation study, EPA developed a lifetime HA of 260 ug/l (EPA 1985d). In the derivation, EPA applied a 1,000-fold uncertainty factor and various intake assumptions to a LOAEL of 300 $mg/m^3$. However, as TCE has been classified as a probable human carcinogen, this level should not be applied (EPA 1985d).

NAS has developed 1-day and 7-day SNARLs for noncarcinogenic end points of 105,000 and 15,000 ug/l, respectively (NAS 1980).

EPA has also developed an ambient water quality criterion for protection of human health based upon noncarcinogenic effects of 6,770 ug/l (EPA, 1980).

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# APPENDIX N

# TECHNICAL OPERATIONS PLAN/HEALTH AND SAFETY PLAN

DC 4900 D969

# TECHNICAL OPERATIONS PLAN
# REESE AFB, TEXAS
# PHASE II – CONFIRMATION STUDY

May 10, 1985

Prepared for:

OCCUPATIONAL AND ENVIRONMENTAL
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# 1. INTRODUCTION

This Technical Operations Plan has been prepared to support the Phase II - Confirmation Study at Reese Air Force Base (AFB), Texas, and represents site-specific work plans and descriptions of technical operations proposed to be carried out as part of the Installation Restoration Program (IRP). This plan is the result of (1) an evaluation of the Phase I - Records Search Report, (2) participation in a presurvey tour with sampling and analysis of the active water supply wells, and (3) decisions and information agreed to during the presurvey meeting and with Dr. John K. Yu (OEHL/TSS), Col. R.C. Wooten, Ph.D. (OEHL/TSS), Lt. Raymond A. Peters (Reese AFB), and 2nd Lt. Mark Stuart (Reese AFB). The work plans for each site are designed to address the scope of activities described for Stage I of the Phase II program, namely, to provide a qualitative assessment of the environmental contamination using a minimum of investigative activities at the sites.

The history of the installation and practices involving hazardous wastes are described in the Phase I report and will not be reiterated here. The listings of sites recommended in the Phase I report for investigation have been modified to conform to the agreements of the presurvey meeting and tour as follows:

- Industrial Waste Lake (S-1);
- Sewage Lake (S-2), including study also related to the East Landfill (D-3), the North Landfill (D-4), the West Landfill (D-5), and the Inactive Fire Training Area (FT-3);

- POL Storage Area (Aquasystem) Spill Site (SP-1);
- Southwest Landfill (D-1);
- Civil Engineering Paint Shop Trench (SI-4);
- Active Fire Training Area (FT-1), including Drainage Impoundment (SI-3);
- Northwest Landfill/Rubble Area (D-11); and
- Hurlwood Aquisition and Landfill (D-7).

Descriptions of the Stage I scope of work for each of these sites are included in Section 2.

# 2. PROPOSED WORK PLANS FOR STAGE I SITE INVESTIGATIONS

The work plans were developed to accomplish Tasks 5a, b, and c of the 8 Feb 1985 Description of Task in F33615-83-D-4003, Proposed Order 4, as described below:

- Task 5a - Determine the presence or absence of contaminants within the area of investigation;

- Task 5b - If contamination exists, determine the potential for migration of these contaminants in the various environmental media; and

- Task 5c - Assess the potential environmental or health risks associated with contaminants in this environmental setting.

To accomplish these goals, several field investigation techniques will be used including:

- Geophysical surveys to determine the perimeter of the various landfill sites and to characterize buried metal, drums, and unique subsurface features, including contaminant plumes;

- Soil-gas survey to determine the presence and extent or absence of spilled petroleum product;

- Soil/sediment sampling, both grab and composite, to determine the presence or absence of shallow subsurface contamination;

- Soil borings with logging and sampling down to the first available water (estimated at 50 feet for a limestone formation) and to the aquifer on the Ogallala formation (at 170 to 180 feet with artesian water at 120 to 130 feet); and

- Monitoring well installation, with sampling of both new and existing wells to determine potential environmental or health risks.

All samples will be split in the field, with delivery of the splits to OEHL/SA at Brooks AFB, Texas.

All soil and sediment samples will be monitored in the field for volatile contaminants. Water samples will be tested in the field for pH, conductivity, and temperature. In general, samples will be analyzed for oil and grease, organic halogen (by either EPA 8010/8020 for soils, or EPA 601/602 for water), and TOC as screening tests for potential contamination. Where appropriate, heavy metals analyses will be run. In the case of the Industrial Waste Lake (SI-1), the Sewage Lake (SI-2), the French Drain (SI-4), and the Hurlwood Acquisition and Landfill (D-7), gas chromatogram/mass spectrometer (GC/MS) analyses will be run for more complete quantification of suspected contamination to facilitate more efficient remediation of these sites.

The Texas Water Well Drillers Act of 1965 as amended in 1981 (Article 7621e) for drilling into groundwater layers requires that upon completion of work on a borehole it must be sealed either by finishing off as a well or by pressure grouting (see Section 14). This is also good drilling practice. Given the need to make borings into water-bearing layers and the requirement to finish the hole, there is an advantage in maintaining access to those subsurface waters for future monitoring by setting monitoring wells. Should that need end at a later date, the wells themselves can be pressure grouted for sealing at that time. E & E estimates that the incremental cost to set a monitoring well will be comparable to the cost of pressure grouting the borehole for shallow borings (50 feet, see Table 2-1).

Table 2-1

COMPARATIVE COST ESTIMATE - PRESSURE GROUTING VS.
MONITORING WELL INSTALLATION

| | Unit Price | Estimated Quantity | Total for Well | Total for Pressure Grouting |
|---|---|---|---|---|
| Soil boring | $ 16.00/LF | 50 LF | $ 800.00 | $ 800.00 |
| Split-spoon samples | 5.00/sample | 11 samples | 55.00 | 55.00 |
| 2-inch ID PVC casing | 4.16/LF | 45 LF | 187.00 | -- |
| 2-inch ID PVC screen | 5.32/LF | 10 LF | 53.20 | -- |
| PVC plugs and caps | 4.44 each | 2 | 8.88 | -- |
| Installation and materials | | | | |
| • Sand | 1.65/LF | 12 LF | 19.80 | -- |
| • Bentonite | 16.65/LF | 2 LF | 33.30 | -- |
| • Cement | 1.32/LF | 36 LF | 47.52 | -- |
| Furnish and install well protection with locking cap and guard posts (3) | 250.00 each | 1 | 250.00 | -- |
| Supply and install grout* | 10.80/LF | 50 LF | -- | 540.00 |
| TOTALS | | | $1,454.70 | $1,395.00 |

Assuming 50-foot borehole; split-spoon samples every five feet.

*Installation time is assumed to be the same for either monitoring well installation or pressure grouting; installation time charges not included.

LF = linear feet

Based on the above rationale, it is cost-effective to set monitoring wells during Stage I for boreholes where the current need may only be marginal.

All wells and borings will be installed according to applicable state and federal regulations (op cit, water well drillers must be licensed in the state of Texas). Drilling activity will be coordinated with appropriate base personnel consistent with overall base management and planning. All applicable state permits and registrations will be obtained, and well data (well logs) as required by the state of Texas will be reported in coordination with Reese AFB and OEHL/TSS.

The following sections outline the recommended work plans for each site. The Technical Operations Plan (Sections 3 through 14) contains additional information on sampling and analytical procedures, and borehole and monitoring well construction.

## 2.1 INDUSTRIAL WASTE LAKE (SI-1, HEREIN DESIGNATED SITE 1)

### Setting

The Industrial Waste Lake (Site 1) is located in the southeast quadrant of the base, adjacent to the fence line along Spur 309 (see Figure 2-1). The lake receives surface water runoff from most of the base area, as well as drainage from the flightline and the industrial shops. There is an oil-water separator three-quarters of a mile upstream from the lake inlet point to separate water-immiscible, lighter-than-water materials. While a flood control system has been installed (1977 and 1982) to prevent overflow of the lake, past flooding has overflowed the banks, even into the field to the east just across Spur 309. In this stage of the confirmation study, survey for potential contaminants in the immediate areas of the lake on the base proper is proposed. Potential contaminants of concern are organics and heavy metals. The past findings of sampling and analyses conducted by the Texas Department of Health and Reese AFB suggest that more specific analyses (GC/MS quantitative analyses) should be run on selected samples at this site to aid in developing recommendations for potential Stage II studies.

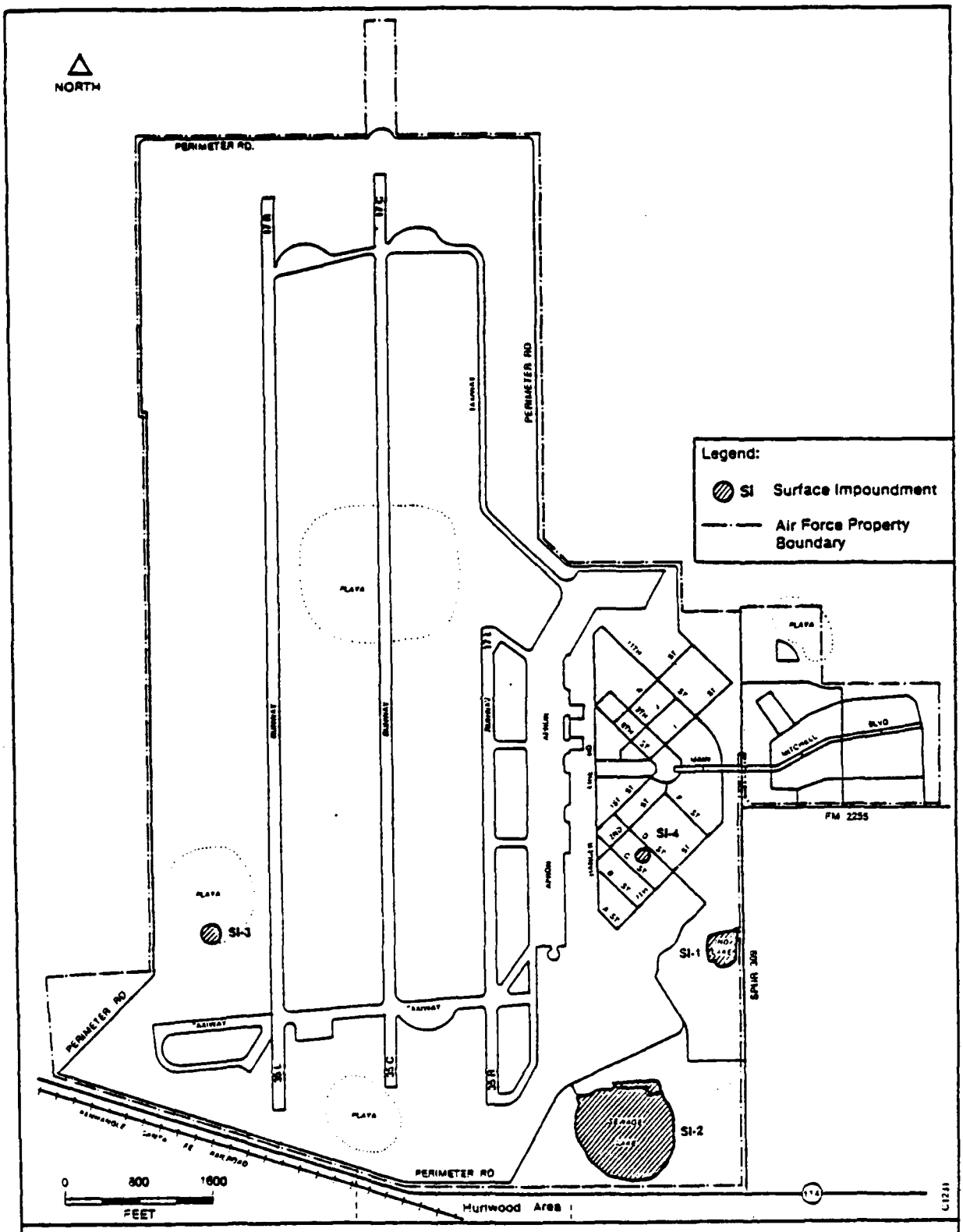


Figure 2–1 LOCATIONS OF ALL IDENTIFIED SURFACE IMPOUNDMENTS, REESE AFB, TEXAS

## Investigation

Borings. To determine the presence or absence of contamination and to augment the sampling previously conducted for the Industrial Waste Lake, five borings will be made around the perimeter of the lake. Four of these are shallow borings to the first water-bearing layer, a limestone layer, nominally set for planning purposes at a depth of 50 feet. Split-spoon samples will be taken at the usual 5-foot intervals with the option to sample at changes in soil type or strata giving positive screening results for volatile components. A maximum of 11 soil samples will be sent for screening analyses.

A fifth boring will be made down to the Ogallala formation, usually found at about 150 to 180 feet, but set for planning purposes in this study at 200 feet. In this boring, attention will be directed to the strata below the limestone layer and up to five soil samples may be collected for screening analyses based on visual changes in the drill cuttings and volatile component monitoring. The purpose of this boring is to make possible an evaluation of potential migration and attenuation of pollutants with depth and to allow and/or provide evaluation of the impact of potential contamination on the groundwater at the present time and/or baseline information on the current characteristics of the groundwater in the area. In addition, this boring, in conjunction with the borings at the various other sites, will provide knowledge of the overall stratigraphy of the base property as well as information on groundwater characteristics.

All drill cuttings in the shallow borings must be drummed and staged until the analytical results are known. It is expected that the base will provide a secure area for the drums. Reese AFB will be responsible for the disposal of the drill cuttings. Because of potential cross-contamination from using drill cuttings as backfill in setting a monitoring well, all cuttings from the deep boring must be drummed and treated the same as those from the shallow borings.

Monitoring Wells. Each of the five borings will be finished as a monitoring well, developed, and sampled, yielding a total of five

groundwater samples. It is economically advantageous to finish the four shallow hollow-stem auger borings as monitoring wells. This will also provide the opportunity for resampling and long-term subsurface monitoring of potential contaminant migration.

The deep boring is required for confirmation assessment of the impact of potential contamination on groundwater. The preferred drilling technique is air/mud rotary, and groundwater sampling requires that the boring be cased and developed. Finishing the boring as a monitoring well is essentially the same operation as one-time boring and sampling. With the addition of a dedicated submersible pump, the total cost of such a well is estimated at about $11,000 (see Table 2-2). Should the well subsequently be sampled two or more times, the time savings for purging alone will pay for the cost of the pump. This approach is recommended for each of the deep borings in this study. The deep boring work will be subcontracted to occur while the shallow drilling is underway by E & E to allow efficient monitoring of subcontractor operations and maximum quality control.

The purge and development water from all the wells will be collected in a temporary storage reservoir and screened in comparison with water from the Industrial Waste Lake. Upon successful screening, water will be discharged to the lake. If screening indicates greater contamination than in the lake, the water will be drummed for analysis and disposed of by Reese AFB.

Surveying of Wells. All wells will be surveyed to the nearest one-hundreth foot elevation by E & E and stamped under registration in the state of Texas. Filing of well information with the state of Texas will be coordinated with Reese AFB and OEHL/TSS.

Mounding Calculation. The information obtained from the five-well system will be used to complete a mounding calculation. Given the best available data and assumptions, the most appropriate equation (for instance, the equations of Hantush 1967; Bianchi and Haskell 1968; or Singh 1976) will be used to generate information on the horizontal and vertical migration of potential contaminants in the subsurface strata immediately surrounding the lake.

Table 2-2

COST ESTIMATE - INSTALLATION OF DEEP MONITORING WELL

| | Unit Price | Estimated Quantity | Total for Well |
|---|---|---|---|
| Soil boring | $ 18.00/LF | 200 LF | $ 3,600.00 |
| Split-spoon samples | 8.00/sample | 5 samples | 40.00 |
| 4-inch ID PVC casing | 8.00/LF | 175 LF | 1,400.00 |
| 4-inch ID PVC screen | 16.50/LF | 30 LF | 495.00 |
| PVC plugs and caps | 10.00 each | 2 | 20.00 |
| Installation and materials* | | | |
| • Sand | 7.35/LF | 32 LF | 235.00 |
| • Bentonite | 23.16/LF | 2 LF | 46.32 |
| • Cement | 4.65/LF | 166 LF | 772.00 |
| Well development | 95.00/hr | 4 hrs | 380.00 |
| Decontamination and cleanup | 95.00/hr | 4 hrs | 380.00 |
| Furnish and install well protection with locking cap and guard posts (3) | 250.00 each | 1 | 250.00 |
| Install dedicated pump | 3,200.00 each | 1 | 3,200.00 |
| TOTAL | | | $10,818.32 |

*Includes time charges for installation.

LF = linear feet

Sediment Sampling. Grab sediment samples will be taken at specific locations around and in the lake. Because sampling and analyses have been conducted previously, this [illegible] contaminant information by determining full priority pollutant analyses through GC/MS determinations for selected samples. The locations to be sampled include the lake bottom sediment, the inlet delta area, the rainwater drainage channels along Spur 309 and between the picnic area and the golf course, and the roadside barrow ditch discharge point southwest of golf green No. 2 at the road intersection.

The lake sediment samples will be taken by driving 2-foot split-spoon samplers, then splitting the top and bottom 1-foot sections as separate samples. This approach will allow either separate analysis of lake bottom soil and sludge or knowledge of and separate analysis of deposited sludge layers. These samples (four) will receive GC/MS and primary metals analyses.

The samples in the rainwater drainage and inlet channels will be taken by trowel in the top 6 inches of soil at a location upstream above the usual standing water level of the lake to evaluate potential "backup" contamination from overflow of the lake during rainfall or unusual situations (such as before the flood control system was installed). Typical screening analyses (EPA 8010/8020, Total Organic Carbon/Oil and Grease) will be run on these samples. Similar sampling and analyses will be run for the discharge point from the lake into the roadside ditch that eventually connects to the Sewage Lake (Site 2).

Water Sampling. A grab sample of the lake water will be analyzed by GC/MS for the full array of priority pollutants. Primary metals analyses will also be run.

## 2.2 SEWAGE LAKE (SI-2, HEREIN DESIGNATED SITE 2), INCLUDING EAST LANDFILL (D-3), NORTH LANDFILL (D-4), WEST LANDFILL (D-5), AND INACTIVE FIRE TRAINING AREA (FT-3)

### Setting

The Sewage Lake (Site 2) is located in the southeast quadrant of the base near the intersection of Spur 309 and the Leveland Road (FM 114, see Figure 2-1). It is roughly four times the area of the Industrial Waste Lake. The Sewage Lake receives discharge from the

base sewage treatment plant and from the overflow of the Industrial Waste Lake. This lake allows evaporation of wastewater, and has no discharge. A Texas Tech University (Lubbock, Texas) study was conducted in about 1979 on the salamander population of the lake based on observation of cancerous growths on salamanders there. The salamander population is said to have reestablished itself since that time. Wildlife, namely ducks and frogs, were readily evident during the pre-survey tour.

Several sites considered in the Phase I records search surround Site 2. These are the East Landfill (D-3), the North Landfill (D-4), the West Landfill (D-5), and the Inactive Fire Training Area (FT-3) (see Figures 2-2 and 2-3). The proximity of these sites to the Sewage Lake requires that they be studied together.

## Investigation

Geophysical Surveys. Subsurface investigation for the presence or absence of potential contamination requires that the perimeters and depths of the surrounding landfills be determined. The presence of buried metal (as in containers) will also be determined by such a study. An electromagnetic conductivity survey will be conducted to define the perimeter of the landfill areas and to delineate the possibility and potential migration of an underground contaminant plume. A proton precession magnetometer survey will be conducted to determine the presence of subsurface metal objects either in the landfill area or adjacent to it where interference with drilling could occur.

Borings. Four shallow hollow-stem auger borings will be made at locations midway between each of the surrounding sites and the lake. The protocol will be the same as for Site 1.

One deep boring will be made at a location southwest of the lake, the suspected downgradient side of the lake. Here, too, the drilling and soil sampling protocols will be the same as at Site 1.

Monitoring Wells. The borings (five) at Site 2 will be finished as monitoring wells using the same rationale and protocols as for Site 1. In this case, purge water from well development will be added to

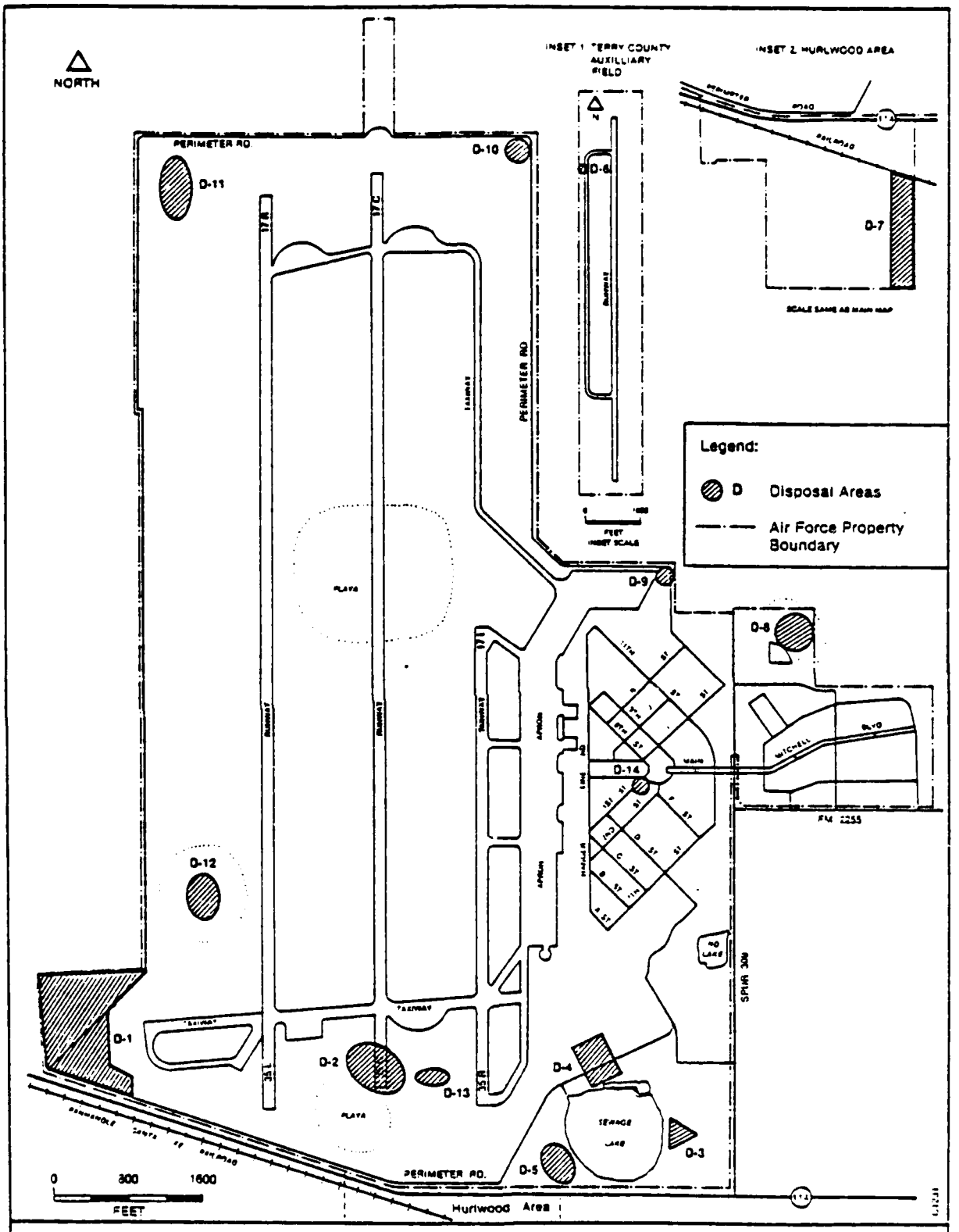


**Figure 2–2** LOCATIONS OF ALL IDENTIFIED LANDFILLS AND RUBBLE AREAS, REESE AFB, LUBBOCK AND TERRY COUNTIES, TEXAS

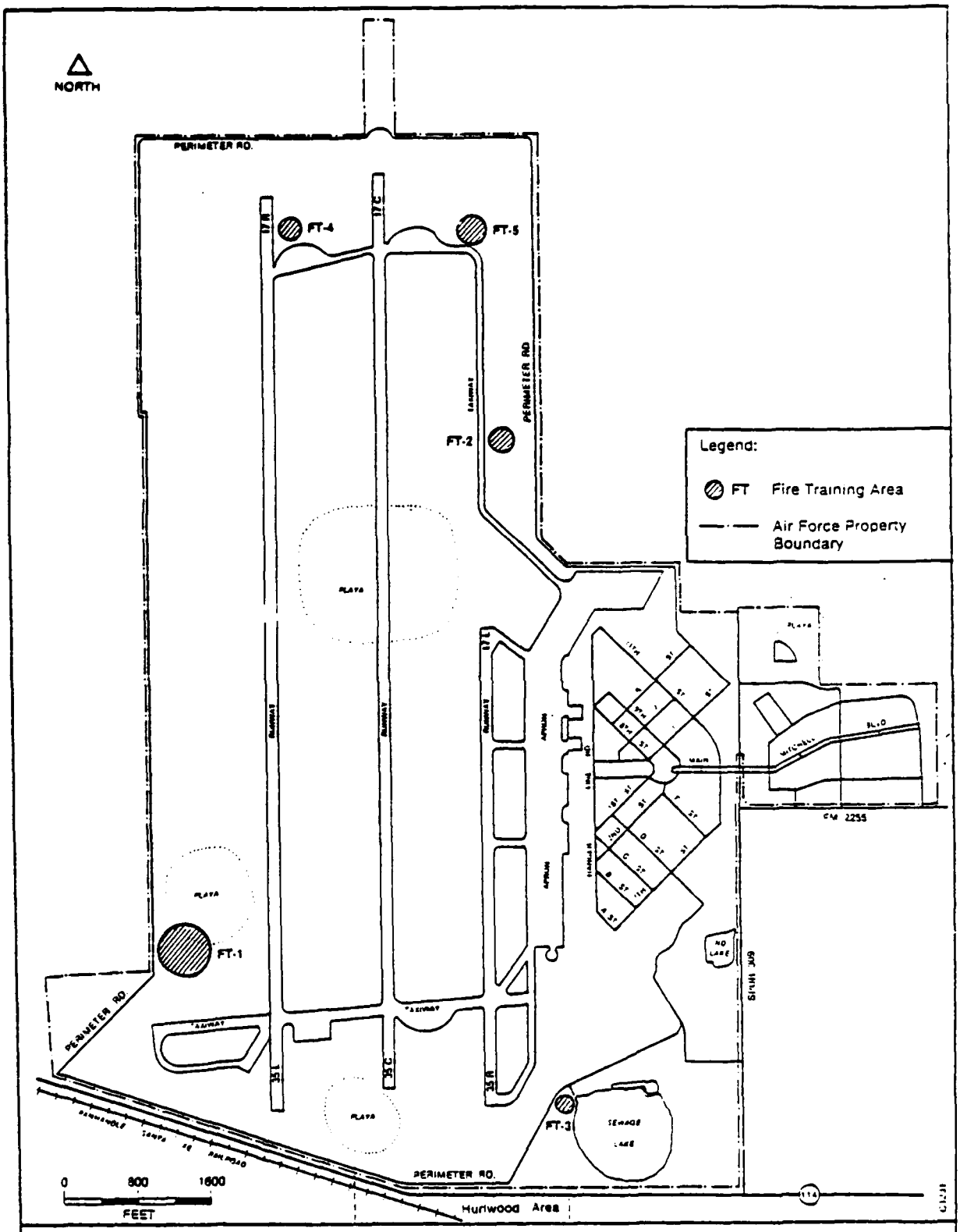


**Figure 2–3** LOCATIONS OF ALL IDENTIFIED FIRE TRAINING AREAS, REESE AFB, TEXAS

the Sewage Lake since the potential contamination from the surrounding sites represents only an insignificant impact for a one-time disposal in that lake.

Surveying of Wells. All wells will be surveyed using the same protocols as for Site 1.

Mounding Calculation. As at Site 1, a mounding calculation will be made to evaluate the potential for horizontal migration of contaminants with downward movement.

Sediment Sampling. Sediment samples will be taken by trowel in the areas of the sewage plant discharge into the polishing lake and the low-flow area at the outlet of the channel into the lake. Typical screening analyses (EPA 8010/8020, Total Organic Carbon/Oil and Grease) will be conducted on these samples. A lake sediment sample will be collected by driving a 2-foot split-spoon into the sediment. As at Site 1, the top and bottom of the sample will be separated and analyzed by GC/MS for the full array of priority pollutants. Primary metals analyses will also be run.

Water Sampling. A grab sample of the Sewage Lake water will be analyzed by GC/MS for the full array of priority pollutants. Primary metals analyses will also be run.

## 2.3 POL STORAGE AREA (AQUASYSTEM) SPILL SITE (SP-1, HEREIN DESIGNATED SITE 3)

### Setting

A spill estimated at 1,000 gallons is documented as having occurred at this site (see Figure 2-4) in 1947 with subsequent contamination and closure of Well #4, cleanup by removal of contaminated soil, airing of the excavation, and backfilling with the aerated soil. It is thought that residue of that old spill or new leakage may be causing further fuel contamination of the POL area. Since Well #4 has been sealed, other investigative techniques are required. The depth of the Avgas Aquasystem (buried at 10 to 12 feet) suggests that a

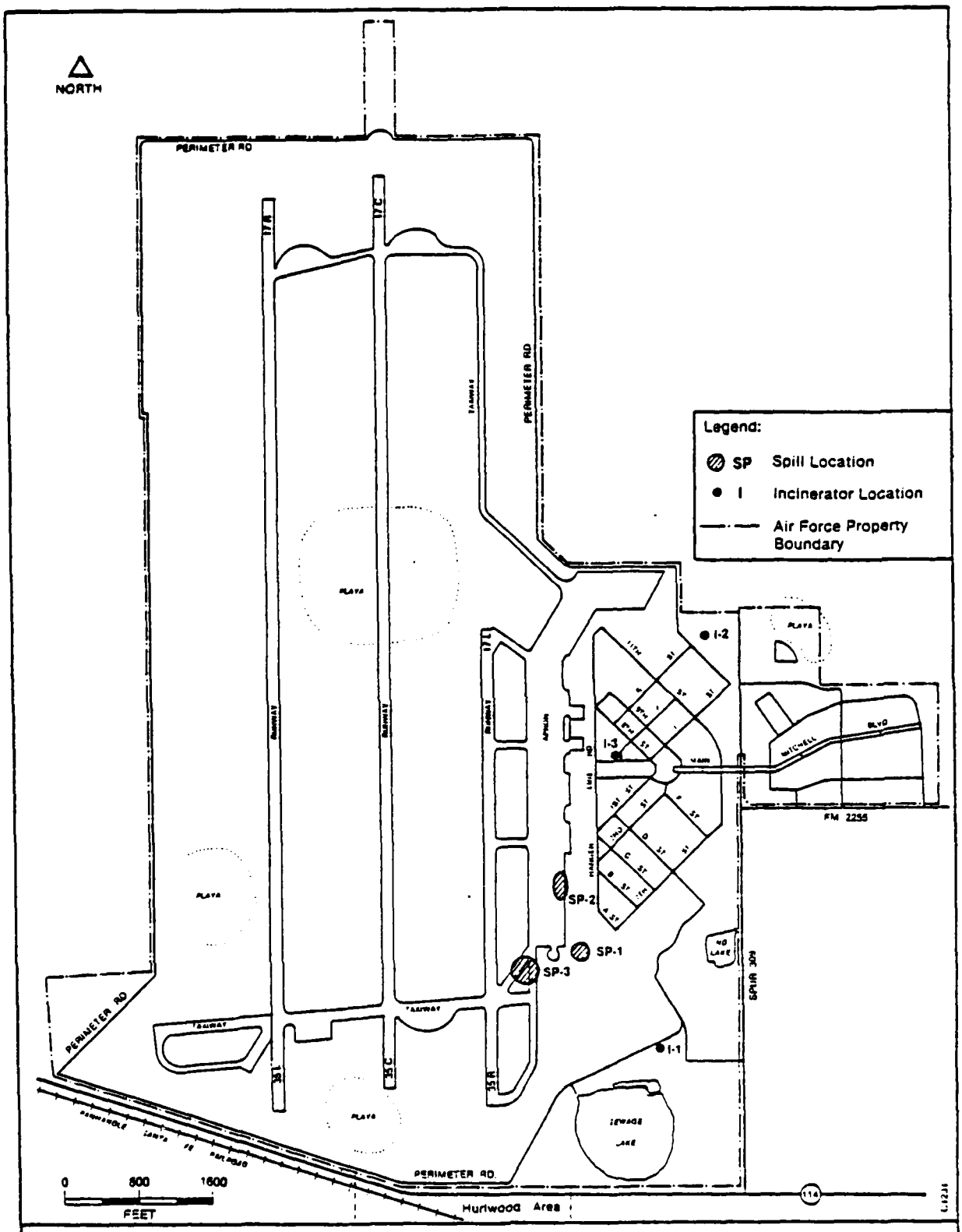


**Figure 2–4** LOCATIONS OF ALL IDENTIFIED FUEL SPILLS AND INCINERATORS, REESE AFB, TEXAS

Stage I screening survey for volatile organics could use 10 to 12 feet as a maximum depth.

Investigation

Soil-Gas Survey. This survey will be conducted using a slambar with extension, a Century Model 128 Organic Vapor Analyzer (OVA), and an MSA 260 Oxygen Meter/Explosimeter. Any background methane content in the clayey loam soils indigenous to the area or in the particular soils of this site will be filtered out by taking readings in each vent cavity (slambar hole) at each depth with and without a charcoal filter in the probe. The difference in the two readings is due to nonmethane/ethane hydrocarbon and combustible volatile materials. Mapping of the results of a soil-gas survey is known to provide rapid and accurate identification of the presence and extent of migration of spilled fuel.

## 2.4 SOUTHWEST LANDFILL (D-1, HEREIN DESIGNATED SITE 4)

Setting

This landfill (see Figures 2-2 and 2-5) presents the interesting situation that one trench, a portion of the total, is suspect and no written records of disposal practices or materials were kept. The site is located in the southwest quadrant of the base, and wastes including pesticides, acids, cleaning solutions, paint chips, ether, cadmium sludge, and sludge from the Industrial Waste Lake (Site 1) were disposed of there.

Investigation

Geophysical Survey. Electromagnetic conductivity and proton precession magnetometer surveys will be conducted as for the landfills at Site 2. The same rationale applies.

Borings. The same approach and protocols will be applied at this site as at Sites 1 and 2, including those for the drill cuttings. Four shallow (50 feet) and one deep (200 feet) borings will be made.

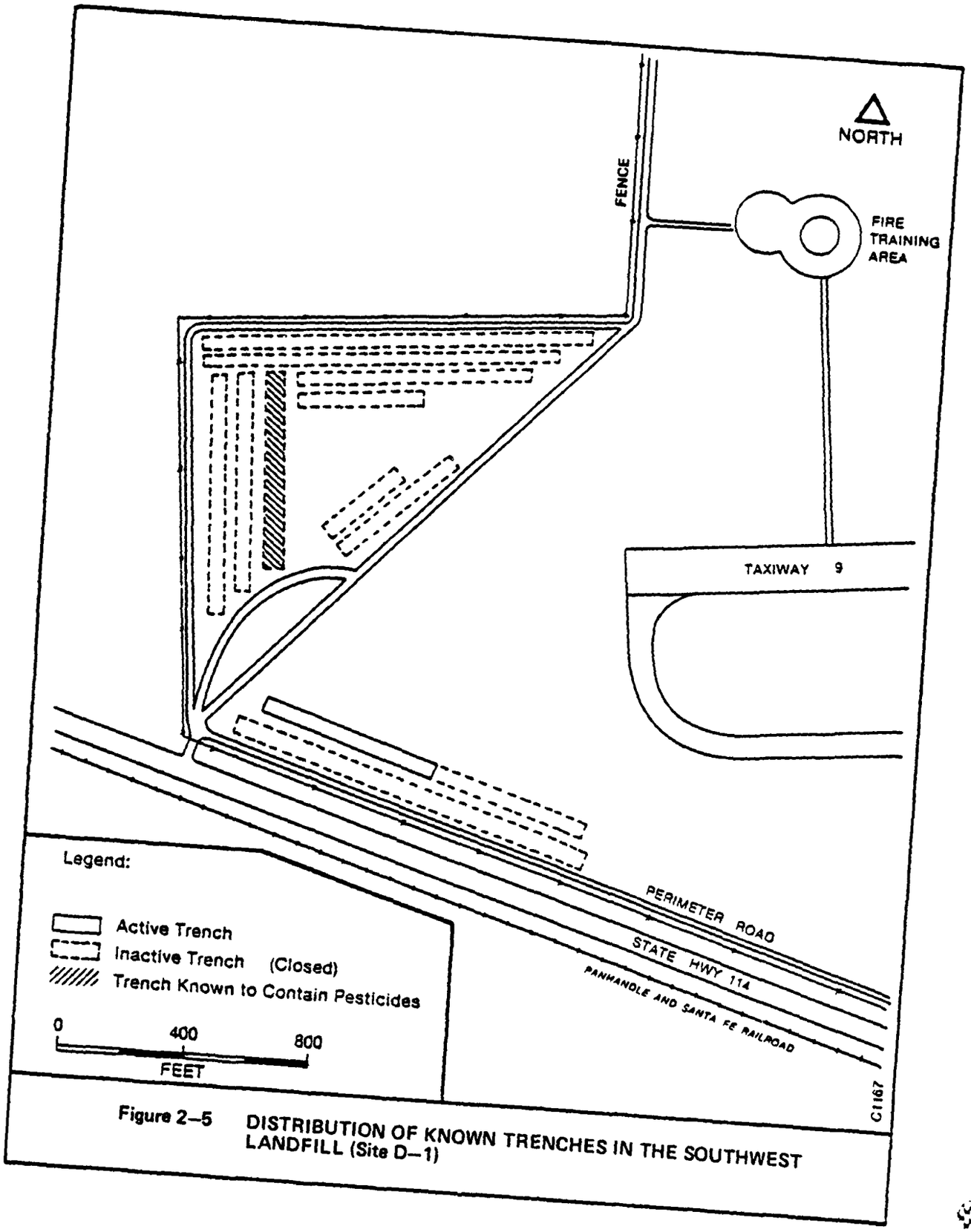


**Figure 2–5** DISTRIBUTION OF KNOWN TRENCHES IN THE SOUTHWEST LANDFILL (Site D–1)

No drilling into the fill itself will knowingly be undertaken. In addition to the typical screening tests (EPA 8010/8020, Total Organic Carbon/Oil and Grease), analyses for pesticides and primary metals analyses will be run.

Monitoring Wells. The borings (five) will be finished as monitoring wells, consistent with the approach and protocols for Sites 1 and 2. Analyses of the groundwater samples will include the same tests as for the soil samples, with the addition of pH, conductivity, temperature, and total dissolved solids.

Surveying of Wells. The monitoring wells will be surveyed using the same protocols and procedures as for Site 1.

## 2.5 CIVIL ENGINEERING PAINT SHOP TRENCH (SI-4, HEREIN DESIGNATED SITE 5)

### Setting

This gravel French drain trench (see Figure 2-1) was used for the disposal of paint shop wastes, including toluene, kerosene, and acetone. In recent months, construction near the site has prompted study by borings and soil analyses to determine the type and extent of contamination. According to an undated letter, circa 7 Feb to 23 Apr 1985, from Colonel John C. Griffith, Commander, 64th ABG, to Messrs. Bryan W. Dixon and Bob Chapin, Texas Department of Water Resources (TDWR), Reese AFB is ready to excavate this site to a depth of 15 feet and to backfill with an impervious clay cap. The exploratory borings were made to a depth of 25 feet, at which no contamination was found. It is likely that by the time the Phase II Confirmation Study is initiated, the proposed remedial action will have been approved by TDWR and completed by Reese AFB.

### Investigation

Boring. To confirm the findings to date and the remedial action proposed for this site, a single boring should be made down to the water table (200 feet nominal) or the first water-bearing layer.

Split-spoon soil samples, not to exceed 11, may be taken to confirm the cleanup and absence of further impact. A groundwater sample will be analyzed by GC/MS analysis to confirm no impact of organic contaminants. Primary metals analyses will also be run. This borehole will be sealed by pressure-grouting.

## 2.6 ACTIVE FIRE TRAINING AREA (FT-1, HEREIN DESIGNATED SITE 6), INCLUDING DRAINAGE IMPOUNDMENT (SI-3)

### Setting

The fire training area (see Figure 2-3) consists of a work area about 40 feet in diameter with an annular concrete ring around a metal mockup of a jet plane. Prior to installation of the concrete, soil testing for lead and for oil and grease showed no contamination. At one edge of the site there is a concrete sump to collect drained fluids from the work area. The sump is about 6 feet deep; a gate valve about 1 foot from the bottom allows water to flow out of the sump through a pipe and onto the ground in a natural drainage path to a natural depression augmented by grading (designated SI-3 in the Phase I report). Located at the far end of this collection area is the site of a closed rubble landfill (designated D-12 in the Phase I report). The opportunity for runoff from the fire training area into these areas indicates that they should be considered together.

### Investigation

Borings. Two shallow borings, one upgradient and one downgradient, will be made to the first water-bearing layer, nominally 50 feet. Split-spoon samples will be taken every 5 feet and analyzed for organic halogens (EPA 8010/8020), TOC, oil and grease, and lead.

Monitoring Wells. The two borings will be finished as monitoring wells, developed, and sampled for groundwater. The two groundwater samples will be analyzed for purgeable organic halogens and aromatics (EPA 601/602), TOC, oil and grease, pH, total dissolved solids, temperature, and conductivity. The wells will be surveyed in the same manner as the other wells in this study.

Soil/Sediment Sampling. Composite sampling at up to six depths at four locations (24 samples) inside the fire training area will yield six composite samples for screening analyses for organic halogens, TOC, oil and grease, and lead. Grab sampling in the first 6 inches of the surface soil in the natural drainage path from the sump outlet and in the area of the natural (playa) depression will allow evaluation of the impact of contaminant migration from the fire training area. The two grab soil samples will also be analyzed for organic halogens, TOC, oil and grease, and lead.

## 2.7 NORTHWEST LANDFILL/RUBBLE AREA (D-11, HEREIN DESIGNATED SITE 7)

### Setting

This site is located in the northwest quadrant of the base near the perimeter road and northwest of runway "A" (see Figure 2-2). According to interview reports of landfill disposal of drums of unspecified toxic wastes in trenches, there is the possibility that both drummed and loose material has been disposed of at this site. The low permeability of the soils and the fact that asphaltic debris from the site were spread out over a large portion of the northwest corner of the base may make characterization at this site more difficult.

### Investigation

Geophysical Surveys. As with Site 2, proton precession magnetometry and electromagnetic conductivity techniques will be used to determine the presence and extent, or absence, of buried drums, subsurface plumes, and the perimter of the landfill.

Borings. Once the perimeters and probable hot spots have been determined by geophysics, borings (four shallow and one deep) will be made according to the protocols and approach described for Site 1. Sampling protocol will also be the same.

Monitoring Wells. The borings (five) will be finished as monitoring wells in the same manner as described for Site 1. The groundwater sampling protocol will also be the same.

## 2.8 HURLWOOD ACQUISITION AND LANDFILL (D-7, HEREIN DESIGNATED SITE 8)

### Setting

This area was formerly part of the town of Hurlwood, but was acquired by the Air Force in 1978 to provide a buffer zone between runway noise and residential homes in the area (see Figure 2-2). Five covered, inactive drinking water wells are present on the property, as well as an inactive, leveled landfill containing wastes from a cotton gin that used to exist on the site some years ago. Although the Phase I report specified this site as a no-hazard area, the presurvey meeting indicated that the five wells should be sampled.

### Investigation

Well Sampling. The five wells on the site are reported to have 10-inch casings. It is believed that there are no pumps remaining in these casings, but this has not been confirmed. Hydraulic pumps, or even residual lines, could be a source of oil in these wells. Ten-inch casing and a water depth estimated at as much as 50 feet (water level at 120 feet above the Ogallala formation at 170 feet) would require very long purge times to remove five well volumes (minimum) when there may be hydraulic oil contamination that will not be removed by the usual purging technique. However, because these sites are lower in priority than the others, it is proposed that sampling proceed with the proper support services provided by Reese AFB as described below.

Opening of the wells (removal of cement slab covers) will require a forklift, grappling chain, and a forklift operator. Removal of piping or dedicated pumps from the wells may require additional forklift time. A tank truck will be required to collect purge water (about 1,000 gallons per well) that will be screened prior to discharge into the Sewage Lake. Assistance by Reese AFB for this equipment is requested.

Sampling of the wells will be done by hand bailer. The well nearest the landfill will be analyzed for priority pollutants, volatile organics, pesticides, dioxin and PCBs, and primary metals, in

addition to the standard measurements for pH, conductivity, total dissolved solids, and temperature. The other wells will be analyzed for purgeable halogenated organics and aromatics (EPA 601/ 602), TOC, and oil and grease, in addition to tests for pH, conductivity, total dissolved solids, and temperature. Because of the reported presence of cotton gin wastes on the site and all around the area, analysis for arsenic as a primary metal is especially appropriate.

Boring. Because of the suspect security of the water wells presently closed by concrete slabs (one was found broken during the presurvey tour), the very long purge times associated with sampling those wells, the logistics of transporting and disposing of the purge water, and the advantage of gaining boring and groundwater information closer to the landfill site (D-7), a new boring down to the Ogallala formation is proposed. Should the field operations for opening and purging the wells indicate that the approach is not practical or cost-effective, there should be a method to assess the potential for contamination from the landfill, and a boring would provide that opportunity.

The protocols for shallow and deep borings will be combined here. Split-spoon soil samples will be taken every 5 feet down to 50 feet followed by a maximum of five samples down to the Ogallala formation, for a total of 16 samples. Analysis will be run for TOC, TOH, oil and grease, and arsenic.

Monitoring Well. This boring will be finished as a monitoring well with a dedicated pump. The well will be sampled, and the groundwater sample will be analyzed for TOC, TOH, oil and grease, pH, conductivity, total dissolved solids, temperature, pesticides, and primary metals. Surveying of the well will be completed using the protocols described for Site 1.

# 3. FIELD SET-UP

Following approval of the proposed project plan, E & E will be responsible for ordering, acquiring, and mobilizing all required personnel and equipment to Reese AFB.

The Air Force will be requested to supply a secure building on Reese AFB to which equipment and supplies can be directly sent and stored prior to and during the project. This building will also be used as a central field and equipment maintenance office, and as a sample handling and storage area.

In addition to the building, a secure fenced-in area preferably adjacent to or near the building will be required for storage of the drilling rig and its equipment when not in use.

During the on-site work, equipment and supplies will be staged at the central location prior to being moved to the specific site under investigation. Following the day's activities, all equipment will be returned to the secured storage areas. No equipment will be left unattended at an investigation site.

The actual in-field set-up of equipment at an investigation site will follow E & E's established procedures. Figure 3-1 shows the basic concept of the standard field set-up. Site-specific considerations will probably necessitate some variations. All entry to an immediate work area will be controlled at all times during field activities in order to minimize the potential health and safety risk to both in-field personnel and any observers.

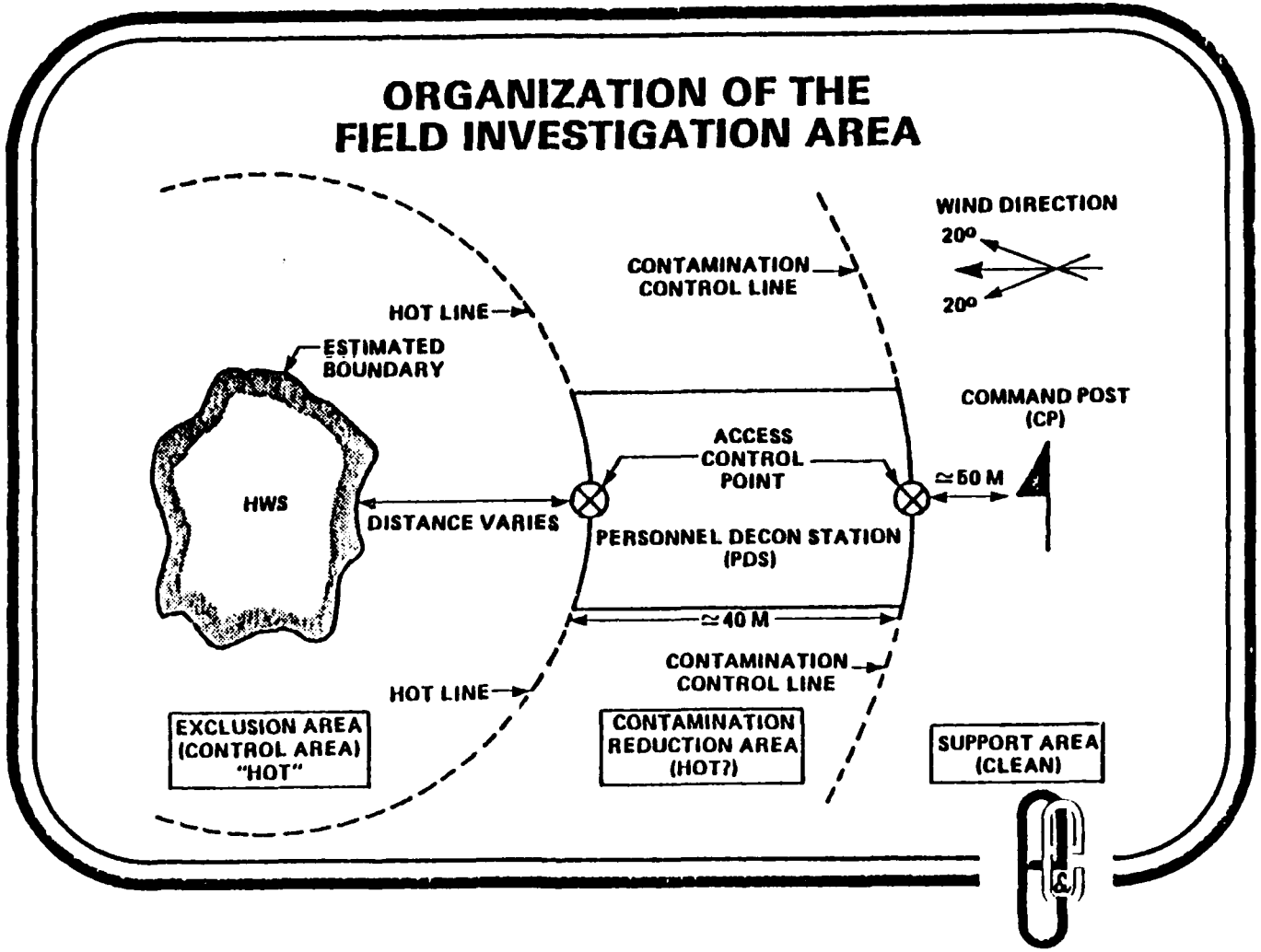


Figure 3–1 ORGANIZATION OF THE FIELD INVESTIGATION AREA

# 4. CALIBRATION OF FIELD EQUIPMENT

All field equipment should have been calibrated prior to delivery to the site. However, because of shock received during shipping and handling, the instruments may require either recalibration or an operational check prior to field use. The method and frequency of calibration for each instrument is generally based on such factors as the type of equipment, extent of use, degree of accuracy required, and manufacturer's specifications. Instrument calibration should be certified by documented standards of accuracy, whether performed at E & E headquarters or by outside calibration or repair services. E & E requires that records of calibration dates and standards be maintained for each instrument subject to calibration.

Each piece of equipment requiring periodic calibration or calibration prior to each use must be accompanied by a bound logbook. The logbook will note the instrument's current calibration status with regard to the date last calibrated, instrument settings during calibration, and the initials of the person performing the calibration.

All instruments are to be stored, transported, and handled with care to preserve the equipment's accuracy. Equipment found to be damaged prior to or during use must be taken out of service immediately and cannot be used again until a qualified technician repairs and recalibrates the equipment in question.

# 5. PREVENTATIVE MAINTENANCE OF FIELD EQUIPMENT

All equipment used by E & E in the field is subject to standard preventative maintenance schedules established by corporate equipment protocols. All equipment is inspected at least twice daily, once before start-up in the morning and again at the end of the work shift prior to overnight storage or return to the charging rack. Regular maintenance such as cleaning lenses, replacement of in-line filters, and removal of accumulated dust is to be conducted according to manufacturer's recommendations and in-field need, whichever is appropriate. All preventative maintenance performed will be entered in the individual equipment's logbook and the site safety logbook.

In addition to preventative maintenance procedures, daily calibration checks will be performed at least once a day in the morning prior to use and duly recorded in the respective logbooks. Additional calibration checks will be performed as required.

All logbooks will become part of either the permanent site file or the permanent equipment file.

# 6. FIELD ANALYTICAL PROCEDURES AND DATA REPORTING

All field analytical procedures and sampling at a facility or from the environment may become physical evidence in a legal action. An essential part of E & E's protocols is that the analysis or sample be controlled at all times and thoroughly documented. E & E maintains serialized field data records (FDRs) in the form of individual sheets or bound logbooks. Company analysts record all on-site measurements and field observations in the FDRs, including all pertinent information necessary to explain and reconstruct site operations. Each page of the FDR is dated and signed by all individuals making entries on that page. The leader of the field team on duty is responsible for insuring that the FDR is used during all activities and is stored safely to avoid possible tampering.

In addition to individual field sheets and daily logbooks, project managers must complete weekly summary sheets delineating the past week's activities. All data sheets, logbooks, and weekly summary sheets become part of the permanent site/project file. Figures 6-1 through 6-5 are examples of the weekly summary sheets that will be used.

## 6.1 CHEMICAL DATA

Chemical field analyses are generally limited to preliminary testing of pH and conductivity and surveying for organic vapors or other hazardous emissions (i.e., HCN, $H_2S$, and contaminated dust). All findings are recorded in the site logbook, site safety logbook,

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FIELD ACTIVITIES
WEEKLY PROGRESS REPORT

Work Site: _____ E & E Job No.: _____ Week Ending: _____

Start Date: _____ Percentage of Field Work Completed: _____

Client: _____

Contractor(s): _____

Personnel and Duties: _____

Drilling:

Number of Holes Drilled: _____ Total Feet Drilled: _____ Average Feet/Day: _____

Material and Types of Equipment Used: _____

Comments: _____

Sampling:

Number of Samples Taken: ____ Water ____ Soil/Sediment ____ Average Samples/Day: ____

Materials and Types of Equipment Used: _____

Comments: _____

Other Field Activities:

Type of Work Performed: _____

Comments: _____

Future Work Plans: _____

_____
Signature/Date

cc: V.P. Technical Services, Project Director, Project Manager, Project File 447025

**Figure 6—1 FIELD ACTIVITIES WEEKLY PROGRESS REPORT**

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DRILLING
WEEKLY PROGRESS REPORT

Work Site: _____ E & E Job No.: _____ Week Ending: _____

Driller: _____ Driller's Helper: _____ Geologist: _____

Number of Drill Holes Drilled and Completed: _____ Average Feet/Day: _____

Drill Hole Information:

1. Hole Designation: _____ Total Depth: _____ Static Water Level: _____
   How Hole was Drilled and Equipment Used: _____
   _____
   Was Hole Cased? _____ Type and Amount of Casing Used: _____ Screened Interval: _____
   Type and Size of Well Screen: _____
   Amount of Sand, Gravel or Cement Used: _____
   Was Hole Developed? _____
   Problems Encountered: _____
   _____

2. Hole Designation: _____ Total Depth: _____ Static Water Level: _____
   How Hole was Drilled and Equipment Used: _____
   _____
   Was Hole Cased? _____ Type and Amount of Casing Used: _____ Screened Interval: _____
   Type and Size of Well Screen: _____
   Amount of Sand, Gravel or Cement Used: _____
   Was Hole Developed? _____
   Problems Encountered: _____
   _____

3. Hole Designation: _____ Total Depth: _____ Static Water Level: _____
   How Hole was Drilled and Equipment Used: _____
   _____
   Was Hole Cased? _____ Type and Amount of Casing Used: _____ Screened Interval: _____
   Type and Size of Well Screen: _____
   Amount of Sand, Gravel or Cement Used: _____
   Was Hole Developed? _____
   Problems Encountered: _____
   _____

_____
Signature/Date

cc: V.P. Technical Services, Project Director, Project Manager, Project File 8A8025

Figure 6–2 DRILLING ACTIVITIES WEEKLY PROGRESS REPORT

ecology and environment, inc.

GEOPHYSICAL SURVEYS
WEEKLY PROGRESS REPORT

Work Site: _____ E & E Job No.: _____ Week Ending: _____

Work Completed: _____

Grid System Used (area covered, spacing and designation): _____

EM Survey:

Type Equipment Used: _____

Area Covered: _____ Time (Hours) Required*: _____

Number of Data Points Collected: _____ Fullspace _____ Halfspace _____

Problem Areas: _____

Comments: _____

Magnetometer Survey:

Type Equipment Used: _____

Area Covered: _____ Time (Hours) Required*: _____

Number of Data Points Collected: _____

Problem Areas: _____

Comments: _____

Seismic Survey:

Type Equipment Used (include number of channels): _____

Area Covered: _____ Time (Hours) Required*: _____

Number and Length of Lines Run: _____

Problem Areas: _____

Comments: _____

Other Geophysical Work: _____

*Total hours charged to project.

_____
Signature/Date

cc: V.P. Technical Services, Project Director, Project Manager, Project File 446025

Figure 6–3 GEOPHYSICAL SURVEYS WEEKLY PROGRESS REPORT

ecology and environment, inc.

WATER SAMPLING
WEEKLY PROGRESS REPORT

Work Site: _____ E & E Job No.: _____ Week Ending: _____

Total Number of Samples Taken: _____ Average Samples/Day: _____

Procedures and Types of Equipment for Sampling: _____

_____

Comments: _____

_____

A. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

B. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

C. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

D. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

E. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

F. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

_____
Signature/Date

cc: V.P. Technical Services, Project Director, Project Manager, Project File 444025

**Figure 6–4 WATER SAMPLING WEEKLY PROGRESS REPORT**

ecology and environment, inc.

SOIL/SEDIMENT SAMPLING
WEEKLY PROGRESS REPORT

Work Site: _____ E & E Job No.: _____ Week Ending: _____

Total Number of Samples Taken: _____ Average Samples/Day: _____

Procedures and Types of Equipment for Sampling: _____

_____

Comments: _____

_____

A. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

B. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

C. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

D. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

E. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

F. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

G. Sample I.D. and Location: _____

Type of Sample: _____

How Sample was Taken: _____

Comments: _____

_____
Signature/Date

cc: V.P. Technical Services, Project Director, Project Manager, Project File 445025

**Figure 6–5 SOIL/SEDIMENT SAMPLING WEEKLY PROGRESS REPORT**

and field data sheets, if appropriate. Any further chemical analysis conducted in the field would be recorded using the procedures stated above.

## 6.2 HYDRAULIC DATA

Several techniques are employed in hydrological investigations. These may be employed separately or two or more may be combined, depending on the client's needs and the nature of a particular study. The contract scope of work normally details the procedures to be followed, describes the facilities, and identifies the equipment required to conduct the hydrologic investigations. The degree of calibration necessary and the exact method of documentation are site/project-specific.

Detailed procedures to be used in hydrologic studies during the Phase II Confirmation Study at Reese AFB may include:

- Water sample collection, preparation, and shipment;
- Pump testing;
- Swabbing;
- Surging;
- Limited field analysis of groundwater samples; and
- Determination of water levels.

All data gathered during hydrologic investigations will be maintained in serialized field logbooks or on individual sheets as previously stated. Figures 6-6 through 6-9 are examples of field data sheets which may be used by E & E field personnel.

## 6.3 SOIL BORING DATA

For each boring and well installation, a field log must be completed by the geohydrologist supervising the operation. The completed log describes the operation, identifies any analyses conducted with findings, and provides a graphic description of the geohydrological environment encountered. The field logs become part of the permanent site file and must be kept in a secure location. Figures 6-10 and 6-11 are examples of the typical field log sheets used by E & E personnel.

DEPTH TO WATER

Well Name/Number _____ Date _____

Time (Military) #1 _____ #2 _____ #3 _____ #4 _____ (C.D.T.) (C.S.T.)

Name of Operator _____

I.D. of Equipment (Vehicle or Iron Horse Number) _____

Date of Last Calibration _____ To be Calibrated (Date) _____

Correction Factor _____ Measuring Point (MP) _____

Land Surface Datum (LSD) to MP _____ (Units)

Depth to Water (DTW) from MP (If measurement is within 0.1% of subsequent measurement, only 2 are necessary)

| | #1 | #2 | #3 | #4 |
|---|---|---|---|---|
| In reading (1) | | | | (Units) |
| Out reading | | | | (Units) |
| Add or subtract (2) from Out reading | | | | (Units) |
| Sum of (1) & (2) | | | | (Units) |
| MP to LSD | | | | (Units) |
| DTW from LSD | | | | (Units) |
| Correction factors of equipment | | | | (Units) |
| Corrected DTW from LSD | | | | (Units) |

Tool used to obtain DTW (float switch, magnesium (copper) screw, transducer -- if transducer, list range and serial number) _____

Other equipment used (digital multimeter, recorder, etc.) List as appropriate
make _____ model _____ serial number _____
calibrated _____ calibration date _____

Procedure number used _____

Altitude of MP _____ (Units) Altitude of water level _____ (Units)

Comments _____

_____

_____

**Figure 6–6 DEPTH TO WATER FIELD LOG SHEET**

MONITORING EQUIPMENT

Well:_____

Date:_____

Time:_____(Time Reference)

Name of Operator:_____

I.D. of logging equipment (vehicle) and/or cable reel No._____

Serial Number of transducer:_____

Range of transducer: 0 to_____(Units)

Calibration of transducer:_____(mv/ft or mv/m)

Voltage to transducer (measured at power supply output with transducer attached):_____

Millivolts or volts as related to barometric pressure (ie. barometric pressure may be 26.73 but is printed on data acquisition system as 2.67v. Therefore entry would be 2.67v = 26.73 inches of Mercury:_____

Other equipment used (type, Serial Number, when calibrated)_____

_____

_____

_____

TRANSDUCER CALIBRATION POINTS

| FT/M[1/] | UP | MV | MV Change[2/] |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

1/ Indicate which units

2/ Per interval or per unit

**Figure 6–7 MONITORING EQUIPMENT FIELD LOG SHEET**

Pump Test

Sheet 1 of 1

Hole no. _____ Test no. _____ Pump setting _____ ft; Geologist/Engineer _____

Cased interval _____ ft; Perforated interval _____; Open hole _____ Diameter _____ in ____

Pump I.D. no. _____; Cable correction _____ ft/ft; Measuring point is _____

| Date 19__ | Hour (Military) | Elapsed time (minutes) | | Water-level measurement (feet or meters)· | | | | Discharge (gpm) | Temp (°F) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Pumping (t) | Recovery (t') | D/W Below MP | I.H. Cable correction | D/W Below LSD | Drawdraw | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
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| | | | | | | | | | | |

Figure 6–8 PUMP TEST FIELD LOG SHEET

Swabbing-bailing test form _____Hole_____Area

Observed by: _____ Date: _____

Hole depth _____ diameter _____ Cased interval _____

Perforated intervals _____ Tested interval _____

Water levels measured with _____

Measuring point is _____ which is _____ below land surface.

Static water level _____ below measuring point.

BAILING TESTS

Type of bailer _____ length _____ diameter (ID) _____

capacity

SWABBING TESTS

Method of measurement (barrel, tank, etc.) _____

Tank dimensions: Width _____ length _____ height _____

Capacity: 1 = _____ 0.1 = _____ 0.01 = _____

Measuring point _____

_____

Depth Casing set _____ Depth swabbing from _____

Weight of fluid at end of cleanout _____ _____ ft.

| Time | Bailer or swab trip no. | Water removed | Depth to water below MP | t', time since discharge stopped | Remarks (temperature, color, specific conductance, etc. of sample) |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |

Figure 6–9 SWABBING-BAILING TEST FIELD LOG SHEET

E & E Drilling and Testing Co., Inc.

FIELD LOG OF BORING
AND WELL INSTALLATION

| | |
|---|---|
| PROJECT NUMBER AND NAME: | BORING/WELL No.: |
| PROJECT MANAGER:<br>LOGGED BY: | SURFACE ELEVATION: DEPTH OF HOLE: |
| BORING DIAMETER: WELL DIAMETER: | CASING MATERIAL: |
| BORING METHOD: | FIELD CHEMIST: |
| HAMMER WT. (lbs): | DRILLER: |
| DROP (inches): | START TIME. COMPLETION TIME:<br>DATE: DATE: |

SAMPLING RECORD

| SAMPLE NUMBER | SAMPLE INTERVAL | TYPE OF ANALYSIS | | | |
|---|---|---|---|---|---|
| | | OVA | HNu | pH | Cond. |
| | | | | | |
| | | | | | |
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MATERIALS RECORD

| DESCRIPTION | QUANTITY |
|---|---|
| TOTAL BORING (FT) | |
| TOTAL CORING (FT) | |
| NUMBER OF SPLIT SPOON SAMPLES | |
| TOTAL CASING (FT) | |
| TOTAL SCREEN (FT) | |
| NUMBER OF CAPS AND/OR PLUGS | |
| SAND: L. P. No. | |
| BENTONITE: L. P. No. | |
| CEMENT: L. P. No. | |
| SECURITY CAP (Y OR N) | |
| WELL DEVELOPMENT (Y OR N) | |

LOCATION DIAGRAM:

**Figure 6–10 FIELD LOG OF BORING AND WELL INSTALLATION (Form 1)**

E & E Drilling and Testing Co., Inc.
FIELD LOG OF BORING
AND WELL INSTALLATION

| DEPTH (FT) | GRAPHIC LOG | DEPTH TO WATER TABLE | SCREENED INTERVAL | BACKFILL MATERIAL | PROJECT NUMBER AND NAME: | BORING/WELL NO.: | SAMPLE NUMBER AND INTERVAL | BLOW COUNTS/6 IN. | DEPTH (FT) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | DESCRIPTION | | | | |

Figure 6–11 FIELD LOG OF BORING AND WELL INSTALLATION (Form 2)

## 6.4 SURVEY DATA

All site surveying will be recorded at the time of the work in either the site logbook or a separate bound logbook, and retained in the secured permanent site file. All entries will be made in ink, with errors indicated by a single line through the initial entry followed by the corrected entry and the initials of the person making the correction.

All surveying will be conducted to an accuracy of 0.01 feet $\pm$ 0.005 feet, thus enabling static water level measurements to be used to determine groundwater flow directions.

# 7. SAMPLE NUMBERING SYSTEM

## 7.1 PROJECT IDENTIFICATION

Project management is a complex and demanding process that requires an established framework to track a project's progress. E & E has established a Work Breakdown Structure (WBS) management plan which is at the heart of project cost control and tracks a project's progress through the identification of discrete tasks or elements, each with its own specific identification number. The overall project will have a six-digit alphanumeric code called the project number sequentially followed by specific task and subtask codes. All work performed or expenses incurred for the project will be attributed to one of the specific task or subtask codes, thereby enabling easy tracking of the project's progress and cost.

For Reese AFB, specific task and subtask codes will be assigned for the different work segments (i.e., drilling of monitoring wells, sampling of groundwater, etc.) following approval of the work plan and receipt of an authorization to proceed from the Air Force.

## 7.2 SITE IDENTIFICATION

All environmental monitoring and sampling sites will be identified using the Air Force's standard format of a nine-digit, alphanumeric code consistent with that required for completion of AF Form 2752. The identifier will be made up of the installation code, followed by the sampling site type code and site location number. All documentation for a specific site will include the site identification code for ease of tracking.

## 7.3 SEQUENCE NUMBER

All samples collected during the project will be identified with an eight-digit alphanumeric code consistent with that required for completion of AF Form 2752. All documentation referencing samples taken will be identified using this system. The sample numbers will classify the sample as to the method and type of sample and the calendar year, and will sequentially identify each sample taken.

## 7.4 SPLIT SAMPLES

If required, sample splits will be obtained, one portion to be retained by the client and one portion to be sent to E & E's Analytical Services Center (ASC) for analysis. Identical sample numbers will be attached to the two (or more) containers and documented in the site logbook. All sample splits will be retained under standard chain-of-custody procedures until they are relinquished to authorized personnel.

## 7.5 FIELD QC SAMPLES

Additional samples taken in the field are used to evaluate both sampling and analytical methods. The three basic categories are blanks, duplicates, and spiked samples. Field spikes are rarely used because complicated manipulations of measured volumes of solutions are undesirable in the field. General criteria are that there will be one blank sample for each 20 field samples, or for each batch, whichever is smaller. Approximately one in 10 samples will be taken in duplicate. The actual quantities and types of QC samples will be decided by the project manager in consultation with the ASC manager. QC samples will be labelled, preserved, transported, and secured in exactly the same manner as samples (see Sections 12 and 13).

### Field Blanks

Various types of blanks are used to check the cleanliness of field handling methods. Because field conditions cannot be as rigorously controlled as they are in the laboratory, positive field blank values are not to be subtracted from sample results. It is not possible to set rules for treatment of field blank results which show a degree of contamination. This is the responsibility of the project

manager and the ASC manager, and they will decide to qualify or reject data taking into consideration all factors in a sampling and analysis project. It is possible to design blanks to monitor each and every stage of a sampling exercise: bottle cleaning, sample equipment cleaning, sample collection, transfer to bottles, bottle decontamination, packing, and shipping. Usually, only two types of blanks are used: the transport blank and the field equipment blank (sometimes called the transfer blank or rinsate blank). Field staff may add blanks if field circumstances are such that they consider normal procedures are not sufficient to prevent or control sample contamination, or at the direction of the project manager. Rigorous documentation of all blanks in the site logbooks is mandatory.

Transport Blanks

Transport blanks are blank samples designed to demonstrate that the transport of sample bottles to and from the field does not result in sample contamination. One of each type of the prepared bottles to be used during sample collection is filled with pure water, capped, and labelled. The project manager may or may not inform the laboratory that this sample is a blank. If the laboratory is not informed, it is permissible to put false identifying information on the label. If this is done, then the project manager must be responsible for preparation of the final report to the client or agency so that the information on that blank does not show up as a mysterious additional sample. Full documentation must be made in the site logbook.

The blank sample is transported to the site, unpacked, carried into the sampling area, labelled, decontaminated, packed, and shipped back to the laboratory. As far as possible, it should receive the same treatment as a real sample except that the bottle is not opened at any time.

Field Equipment Blanks

Field equipment blanks are blank samples (sometimes called transfer blanks or rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use, and that cleaning procedures between samples are sufficient to minimize cross contamination. If a sampling team is familiar with a

particular site, they may be able to predict which areas or samples are likely to have the highest concentration of contaminants. Unless other constraints apply, these samples should be taken last to avoid excessive contamination of sampling equipment.

Field equipment blanks can be taken before the sampling apparatus is used to collect any samples at the beginning of the day. In this case, the blanks are used to test the initial preparation of the sampling apparatus. The sampler (bailer, split spoon, coliwasa, etc.) is rinsed with pure water (or, in some cases, solvent) and the rinsate is collected and treated as any other sample. Alternatively, or in addition, field equipment blanks can be taken during a sampling run, in which case they serve to test the efficiency of the field cleaning procedures used to prevent cross contamination. The equipment is cleaned in the recommended way, then rinsed with water (or solvent), which is then collected. In either case, it is the responsibility of the project manager and the ASC manager to interpret the results and reject or qualify data accordingly.

Duplicate Samples

Approximately one in 10 samples will be taken in duplicate. Duplicate samples are identical samples (same place and time, or immediately consecutive) placed in identical containers and treated as normal samples. For the purpose of data reporting, one is arbitrarily designated the sample, the other as the duplicate. Both sets of results are reported (not averaged) to give an indication of the precision of the sampling and analytical methods.

The project manager decides which samples are to be duplicated and whether or not to inform the laboratory. If the project manager wishes to make an assessment of the laboratory's precision without the laboratory's knowledge, the duplicate sample can either be labelled simply "duplicate" or with some false identifying information (e.g., a non-existent monitoring well identification number). In this case it is the project manager's responsibility to assess data quality on the basis of the duplicate results.

# 8. DRILLING AND INSTALLATION OF GROUNDWATER MONITORING WELLS

## 8.1 DRILLING

E & E employs a wide range of soil and rock boring techniques, including those using drive casing; both solid- and hollow-stem augers; water, air, and mud rotary and reverse rotary drills; and cable tools. The data requirements for a given well dictate the size and depth of the well, the materials to be used in its construction, and, ultimately, the method of its installation. Table 8-1 lists some available drilling methods and their limitations.

E & E's approach to well drilling and boring design will depend on the specific nature of the past operation, the present data needs, the current environmental setting at each site, and any projected remedial actions. The drilling program will have detailed specifications of procedures and techniques for well and boring location, type, and design; sample collection, preservation, and transportation; analytical procedures; and chain-of-custody control. The use of such specifications will avoid the "hit-or-miss" approach that is typical of less sophisticated programs and will eliminate hidden costs.

Soil samples will be taken every 5 feet (unless otherwise specified by the Air Force) and at every change in strata by driving a 2-inch outside diameter, 2-foot-long split-spoon sampler. Samples will be inspected in the field by a qualified hydrogeologist who will establish site stratigraphy and geologic trends. All field data will be documented in a well log (Figure 8-1) that will be presented to the Air Force. The driller will be required to keep a similar log to serve as a cross-check of the accuracy of the field notes. Representative portions of each sample will be retained in labeled jars.

Table 8-1

SOME AVAILABLE DRILLING
METHODS AND THEIR LIMITATIONS

| Method | Assets and Limitations |
|---|---|
| Drive casing | Inexpensive and excellent for shallow, small-diameter wells. Vertical samples can be obtained by split-spoon and Shelby tube samplers with relative ease. Equipment is mobile and can be moved to virtually any location. Equipment can be obtained with coring capabilities. However, the method is relatively slow and is limited to about 100 to 150 feet in depth. A supply of drilling water is necessary. This water is introduced into the boring, thus creating potential cross-contamination or dilution problems. Trouble can be encountered with boulders and coarse gravel. |
| Hollow-stem auger | Inexpensive and particularly well-suited to shallow wells in unconsolidated formations. Drill rigs are highly mobile and easy to set up. No drilling fluid or washwater is required. Soil and water samples and bedrock cores can be taken through hollow-stem rigs. However, drilling depths are limited to 100 to 150 feet--often less in tight formations or coarse gravels. If boulders are encountered, it is usually necessary to abandon the hole. |
| Hydraulic rotary | Fast and well-suited to drilling larger-diameter wells in consolidated and unconsolidated formations. Much greater depths can be attained by this method. Core samples can be collected. The chief drawbacks are the expense, complexity of equipment operation, and difficulty in obtaining undisturbed soil samples. In addition, a supply of drilling water is necessary. This water is introduced into the boring, thus creating potential cross-contamination or dilution problems. |
| Air rotary | Similar to the hydraulic rotary, this method has the added advantage of not having to use drilling fluids while offering the versatility of being able to use a conventional roller cone bit and mud pump. Air rotary is probably the fastest drilling method available. However, the borehole size generally is limited to eight inches. |
| Cable tool | Relatively simple to operate and can be employed to drill large-diameter wells in consolidated and unconsolidated formations. Core samples can be collected. However, tends to be slow and drilling water may dilute formation water. |

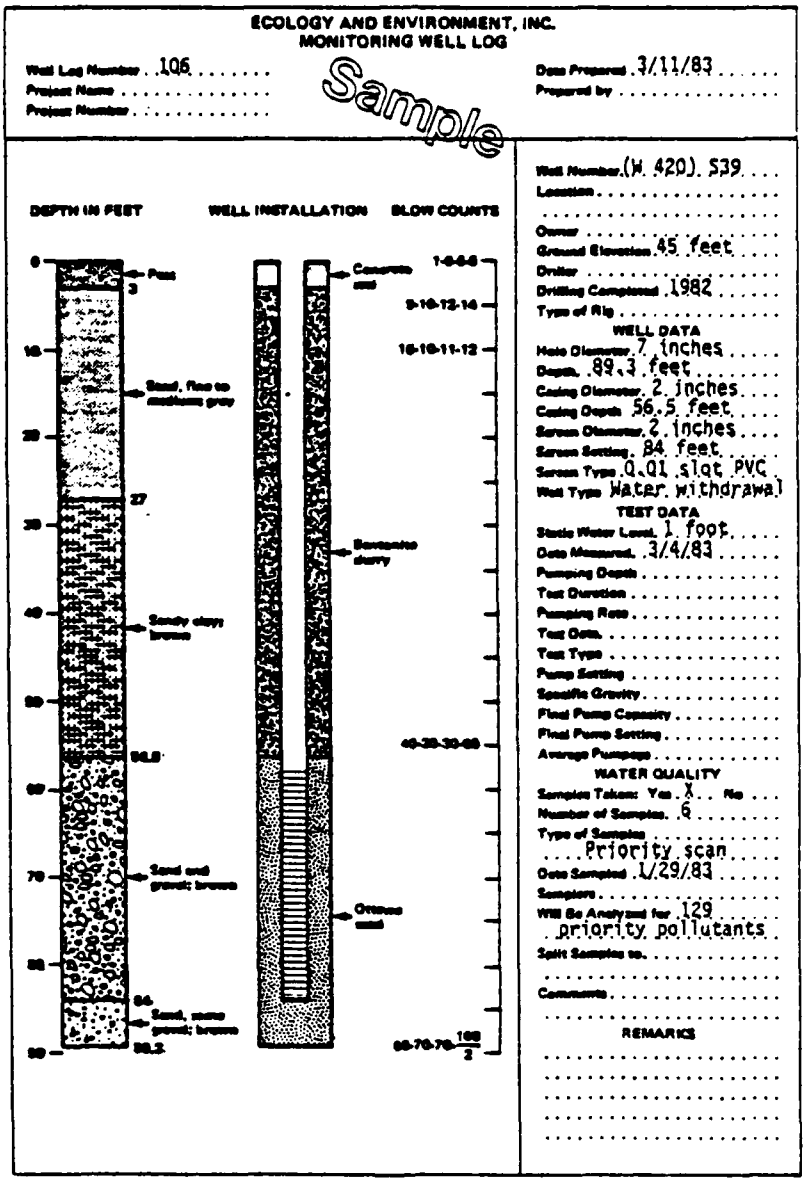


**Figure 8–1 SAMPLE MONITORING WELL LOG**

Bedrock cores are obtained by the use of diamond-tipped core barrels. All cores will be retained for future study, which may include microscopic examination of rock thin sections under a petrographic microscope to determine rock type, extent of microfracturing, and the like. Knowledge of these properties could aid team hydrogeologists in assessing the likelihood of the bedrock regime's acting as a conduit for off-site migration of contaminants. All drilling and boring will be conducted with strict adherence to ASTM standards, if applicable.

If drilling is conducted in areas suspected of being contaminated by volatile organics, samples of drilling spoils will be collected and placed in 50-mL vials with Teflon-coated septa. "Head-space" samples will be withdrawn and field-screened, using a Century Model 128 OVA, to estimate total volatile organic contamination. These data subsequently will be used to help delineate the vertical extent of contamination, establish the interval over which the well will be screened, and help characterize the contamination in order to determine the level of respiratory protection required on-site.

Stringent safety regulations will be adhered to by all E & E personnel and subcontractors. An in-depth description of the E & E corporate health and safety program, which will be followed by personnel working on Air Force projects, can be provided upon request.

## 8.2 SOIL SAMPLING

Soil samples will be taken at 5-foot intervals or, if warranted, on a continuous basis using split-spoon samplers. Shelby tube samples of undisturbed soil will be obtained for laboratory analysis of parameters such as hydraulic conductivity, shearing strength, and porosity. Bedrock will be obtained using diamond-tipped core barrels. The bedrock cores may be taken to the depth at which the well will be screened.

As soil samples are taken from the split spoon, an OVA will be used to "sniff" them for the presence of organic vapors. Samples will be forwarded to E & E's ASC for additional evaluation, either as composite or discrete samples.

All soils will be classified on-site by a geologist using the Unified Soil Classification Scheme.

Each containerized soil sample to be used in a composite will be sieved through a No. 8 mesh screen to remove stones and debris. Screening will be accomplished using a Teflon scraper to force material through the screen. This insures that the sample weight is not distorted by stones and debris with respect to any compound that may be present. The screened sample will then be weighed and returned to its original container for storage until all soil samples have been screened. The weight of the screened samples will be recorded for future use.

A portion of each screened sample will then be weighed to provide equal portions for the homogenization step. The weighed portions will be mixed thoroughly in a prepared 16-ounce sample bottle using a spatula. A homogeneous mixture will be attained by stirring the sample at least 10 to 15 times. The mixed sample will then be placed on a Teflon sheet and shaped into a rectangular form of even thickness. The rectangle will then be quartered: two diagonal quarters will be combined as the client composite; the alternate diagonal quarters will be combined as a storage composite. For storage, the composites will be placed in prepared containers, sealed, and accompanied by appropriate sample control records. The storage composites will be held at the ASC in a secured storage area until the project is complete.

The soil composites for volatile organic analysis will be prepared in the following manner. During field operations, a portion of each soil sample will be placed in a 40-mL borosilicate vial. Equal portions of soil will be removed from each vial and placed in the composite vial. The composite samples will then be mixed quickly and the vial sealed.

More detailed soil contamination data will be required if soils contaminated with hazardous materials are to be excavated and removed to approved disposal facilities. For this type of investigation, the surface of the disposal site will be surveyed and gridded into areas of approximately 1,000 square feet. (Grid size may vary, depending on the nature of the site and underlying soils.) A borehole will be installed at the center of each grid square; soil samples will be taken at the ground surface and at 5-foot intervals until the appropriate depth has been reached. This depth may vary from as

little as 5 feet in areas underlain by compact clays to as much as 100 feet in areas underlain by coarse sand and gravel. The result of this type of study is a three-dimensional representation of the soil beneath the site to the appropriate depth, with contaminant data for each block.

Surface water drainage channel soil samples will be taken to a depth of 12 inches, typically at 50-foot intervals, to a distance of 150 feet from the site boundary along each channel.

## 8.3 MONITORING WELL CONSTRUCTION AND COMPLETION

Upon completion of the borehole, team hydrogeologists will supervise the installation of the monitoring well(s). The type of materials used in well construction will vary according to data requirements. For example, in a shallow, unconsolidated glacial aquifer contaminated by volatile organic contaminants, the project team normally would specify 2-inch diameter PVC pipe with threaded joints. If contamination by certain ketones or aromatic compounds is suspected, it may be necessary to specify stainless steel casing in order to eliminate potential chemical reactions that could occur if PVC were used. A Johnson-Keck submersible pump would be specified for purging and a Teflon bailer would be specified for sampling. Other variables could include the length of well screen, screen slot size, type of backfill to be used, type and length of seal or grout, and type of well security to be used. All variables will be considered carefully and the best design for the job will be presented to the USAF-OEHL project engineer for approval.

Figure 8-2 shows three alternative types of monitoring wells, each designed to address a different set of data requirements:

- Fully screened wells are used to enable the hydrogeologist to obtain a composite sample of groundwater to establish compliance points and detect the presence of any aquifer contamination. Their use also is recommended in conducting pumping tests to obtain accurate measurements of aquifer response.

- Bedrock wells enable selective sampling of the bedrock aquifer in order to measure groundwater quality and to evaluate the interaction between bedrock and unconsolidated aquifers.

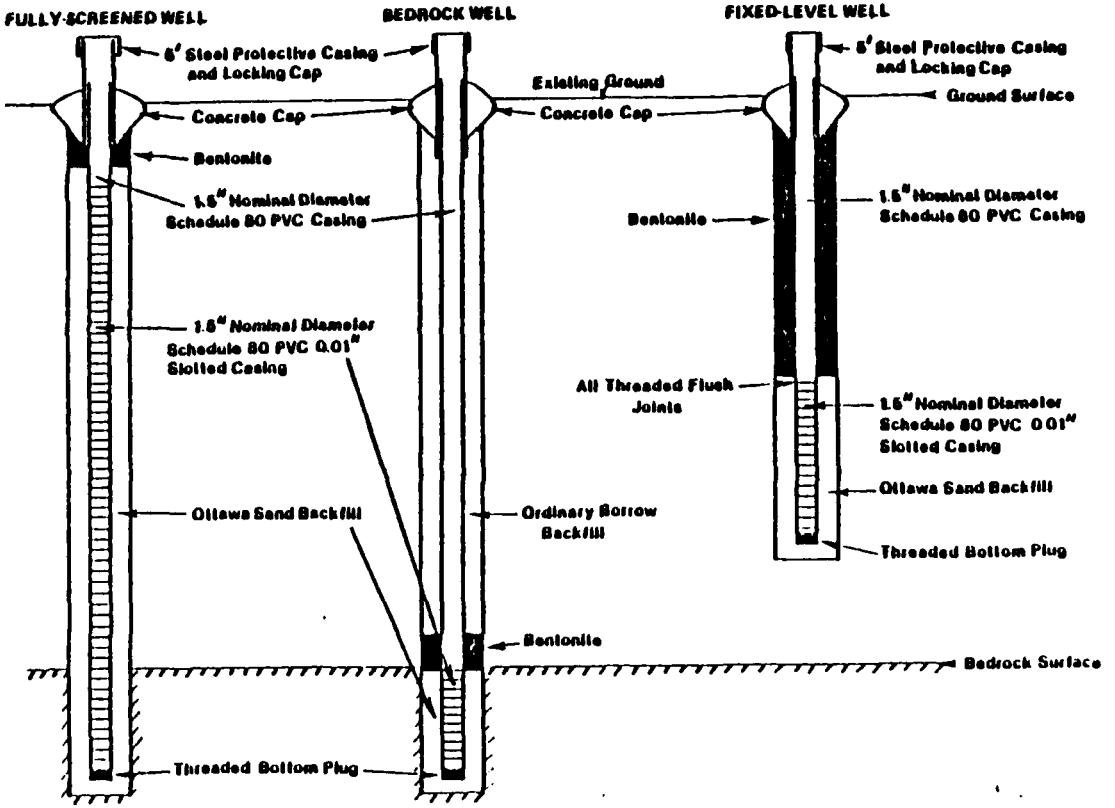


Figure 8–2 TYPICAL DETAIL OF MONITORING WELLS

- Fixed-level wells are utilized to take isolated samples from individual strata suspected of containing contaminated groundwater. These wells also can provide an early warning system to detect the movement of contamination into isolated, pollutant-free aquifers. Great care will be taken to preclude the possibility of cross-contamination of aquifers by carefully reviewing geologic and geophysical data, conducting field analyses of soil samples for contamination, and the placing of grouting material at confining layers.

When drilling in a potentially contaminated environment, it will be necessary to collect and dispose of drilling spoils and washwater and to dispose of or properly decontaminate protective equipment. Furthermore, to prevent cross-contamination between wells, it will be imperative to decontaminate all drilling equipment between wells (see Section 11.1). This may necessitate steam cleaning the equipment, rinsing it with a solvent, and then subjecting it to a second steam cleaning. Subject to all pertinent local, state, and federal regulations, decontamination wastes will be containerized and all contaminated wastes generated on-site subsequently will be removed to an approved disposal facility by a licensed hazardous waste hauler.

Unless otherwise specified, E & E will design all wells as permanent sampling locations. Therefore, care will be taken to locate the wells so that they may be incorporated into future monitoring and remedial operations. Concrete caps and protective, lockable steel casings will be installed around each well, thus reducing the possibility of vandalism while insuring sample integrity.

All well casing top elevations will be surveyed to an accuracy of $\pm$0.01 feet, thus enabling static water level measurements to be used to determine groundwater flow directions.

All drilling operations, installation procedures, sampling data, and waste disposal operations will be fully documented in bound field books to assure that the highest degree of care has been taken in completing all required work.

## 8.4 WELL DEVELOPMENT

At least 48 hours after internal mortar placement, the monitoring wells will be developed according to procedures prescribed in Appendix E of the Solicitation. Well development will be conducted using either a submersible pump, airlift methods, or a bottom discharge bailer, with or without a surge block. The wells will be drilled without the use of drilling fluid and a minimum of five times the amount of the standing water volume in the well, including the well screen, casing, and saturated annulus (assuming 30% porosity), will be removed. Wells will be developed until the well water is clear to the unaided eye, the sediment thickness remaining in the well is less than 5% of the screen length, and the five well volumes (described above) have been removed.

Well development also will include washing the entire well cap and the interior of the well casing above the water table using only water from that well. The result of this operation will be a well casing that is free of extraneous material (grout, bentonite, sand, etc.) inside the riser, well cap, and blank casing between the top of the well casing and the water table. This washing will be conducted before and/or during development, not after development.

The following data will be recorded as part of well development:

- Well designation;
- Date(s) of well installation;
- Date(s) and time of well development;
- Static water level from top of well casing before 24 hours after development;
- Quantity of water lost:
  - During drilling and
  - During fluid purging;

- Quantity of fluid in well prior to development

  - Static water level and

  - Contained in saturated annulus;

- Field measurement of pH before, twice during, and after development;

- Field measurement of specific conductance before, twice during, and after development;

- Depth from top of well casing to bottom of well (from diagram);

- Screen length (from diagram);

- Depth from top of well casing to top of sediment inside well, before and after development:

- Physical characteristics of removed water, including changes during development in clarity, color, and particulates;

- Type and size/capacity of pump and/or bailer used;

- Description of surge technique, if used;

- Height of well casing above ground surface; and

- Quantity of fluid/water removed and time of removal.

The water removed from a well during development will be stored on-site in bulk containers or drums for proper disposal if the water is contaminated.

## 8.5 GEOPHYSICAL LOGGING

All boreholes for monitoring wells will be geophysically logged for the purpose of cataloging and correlating lithology and stratigraphy. Because the boreholes will be drilled without the use of drilling fluids, it is recommended that calibrated nuclear logs, such as neutron and gamma-gamma, along with natural gamma logs, be used. Electric logs, such as spontaneous potential and resistivity, cannot be run due to the lack of drilling mud and, although there may be some water in the drill hole, it is not anticipated that the water height will be sufficient to allow meaningful surveys to be performed. Nuclear logs will supply information pertaining to lithology, stratigraphy, total porosity or bulk density, and moisture content. The advantage of these logs is that they can be used in either cased or uncased boreholes. As a cost-saving benefit, E & E recommends that all geophysical logging be performed upon completion of all well construction, to minimize standby costs.

Table 8-2 contains a summary of log applications that may be used for this project, and the types of information that may be obtained from each.

Table 8-2

SUMMARY OF LOG APPLICATIONS

| Required Information | Widely Available Logging Techniques that Might be Used |
|---|---|
| Lithology and stratigraphic correlation of aquifers and associated rocks | Electric, sonic, and caliper logs in open holes; nuclear logs in open or cased holes |
| Total porosity or bulk density | Calibrated sonic logs in open holes; calibrated neutron and gamma-gamma logs in open or cased holes |
| Location of water level or saturated zones | Electric, temperature, and fluid conductivity in open holes or inside casings; neutron and gamma-gamma logs in open holes or outside casings |

# 9. AQUIFER TESTING

The movement of groundwater and any associated contaminant plume through an aquifer is controlled by the physical characteristics of the medium and the hydraulic head gradient. Changes in the potentiometric surface caused by the pumping of local wells can be evaluated to determine formation permeabilities, specific yield, drawdown, and extent of cones of depression. All of these properties are important in assessing the potential impact of a contaminant plume on local groundwater quality. Artificial changes in the hydraulic head caused by withdrawing water from the aquifer can locally distort the potentiometric surface and alter the flow direction of a contaminant plume. Proper placement of a pumping well may locally lower the water table, effectively isolating a potential source of contamination from contact with the groundwater. A pumping well situated in a contaminant plume can be incorporated into a remedial action plan to remove the contaminated water for treatment purposes. A pumping well also can be used as a diagnostic tool to determine the hydraulic connection between adjacent aquifers in order to aid in the siting of proposed landfills, lagoons, and waste storage sites.

By interpreting the aquifer response to any of a variety of field tests, E & E hydrogeologists infer data pertaining to transmissivity, storativity, and boundary conditions, as well as data pertinent to the movement and extent of contaminant plumes.

Existing wells will be used whenever possible to reduce project costs. Generally, a well diameter of at least four inches will be needed. Three or more observation wells usually will be specified.

The wells will provide the water table data for varying distances from the pumping well, which will be used to determine the size and shape of the cone of depression and the aquifer transmissivity.

E & E will supervise the design and installation of suitable wells. Pumping wells will be of sufficient size to accommodate standard submersible pumps and generally will be screened over the entire saturated thickness of the aquifer. Observation wells will be sited to provide the data thought to be necessary and will be screened in the proper strata to accurately gage the aquifer response to pumping.

Normally, a pumping test will be conducted as a 72-hour step-drawdown test. E & E personnel will monitor the wells for the full duration of the test (discharge rates will be measured by a free discharge pipe orifice or by a commercially available flow meter). Hydrogeologists will evaluate the data using type curves for both time-drawdown and distance-drawdown solutions. The methodologies pioneered by C.V. Theis in 1935 will be used to analyze confined aquifer situations; the methodologies developed by S.P. Neuman in 1975 will be used to analyze unconfined aquifer systems.

When pumping tests are conducted in contaminated environments, periodic sampling will be conducted to enable E & E hydrogeologists to assess changes in pollutant content and to determine the effects of pumpage on the contaminant plume. The discharge of contaminated groundwater generated by a pumping test may need to be contained or may require a National/State Pollutant Discharge Elimination System permit from the appropriate regulatory agency if it is discharged to a sewer or to a body of surface water. E & E will assist in the acquisition of any required permits.

On a smaller scale, individual piezometer wells can be used to conduct in-situ permeability tests. Such tests involve creating an instantaneous head change in the piezometer and then recording head recovery versus time as the water level gradually returns to its static condition. In-situ permeability tests are of two types: "slug" tests, in which a volume of water is instantaneously added, and "bail" or "pump" tests, in which a volume of water is instantaneously removed. The method that E & E most commonly uses to interpret these

data and derive a permeability number is the method of Hvorslev*, which uses time/head-change data to graphically calculate a factor, $T_o$, "basic time lag." Then, for a piezometer screen length of L, a sandpack radius of R, and a well casing radius of r, the permeability, K, is defined as:

$$K = \frac{r^2 \ln (L/R)}{2L\ T_o}$$

The computation of K for each piezometer allows a hydrogeologist to compute the actual rate at which the groundwater (and thus contaminants) leaves the site by applying the following version of the common Darcy equation for groundwater flow:

$$Q = KiA,$$

where Q is groundwater discharge; K is permeability; i is hydraulic gradient (derived from piezometer water levels); and A is cross-sectional area perpendicular to flow.

A typical aquifer test will include collection of background data for siting purposes, installation of a discharge well and three observation wells, monitoring to establish background conditions, performance of a 72-hour pump test, and interpretation of the results.

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*Hvorslev, M.J., 1951, "Time Lag and Soil Permeability in Groundwater Observations," United States Army Corps of Engineers, Waterways Experiment Station Bulletin 36, Vicksburg, Mississippi.

# 10. GROUNDWATER MONITORING AND SAMPLING

## 10.1 GROUNDWATER LEVEL MEASUREMENT

Water levels will be measured at all monitoring wells and surface water staff gaging stations on a monthly basis. Work will be performed in accordance with established safety requirements by either contractor or subcontractor personnel. All measurements will be taken to within 0.01 foot.

The top of the interior casing of all monitoring wells will be marked at one point, which will be surveyed to determine its elevation. The depth of the water table below the top of the casing will be determined by a steel tape or electric water level indicator. All equipment will be decontaminated between wells to prevent cross- contamination.

## 10.2 SURVEYING OF WELLS

Following completion of the installation of the final well, each installed well location will be surveyed to determine map coordinates (Univeral Transverse Mercator, State Planar, or latitude/longitude) to within one meter and entered onto a site map. Elevations of both the ground surface and the top of the well riser will be surveyed to within 0.01 foot ($\pm$ 0.005 foot if possible) using the National Geodata Vertical Datum of 1929. These data will become part of the permanent site file.

## 10.3 ON-SITE ANALYSIS

Groundwater sampling and analysis will involve the following steps:

- Measurement of the static water level;
- Purging of several well volumes;
- Acquisition of the sample;
- On-site analysis: and
- Off-site analysis (see Section 10.4).

Before any water is drawn from a well, the static water level depth from the top of the casing is measured, then the well is purged. If the well can be completely dewatered, the purging process consists of removing a volume equivalent to twice the volume of the standing water originally contained within the monitoring well plus the surrounding sand or gravel pack, if present. If the well cannot be dewatered (because the specific yield is relatively large), the purging consists of the removal of at least five standing volumes (possibly more, depending on the results of pH and specific conductivity testing conducted on the purge water in time series). The values are time plotted and the purging process is considered complete when the values have stabilized. In most cases, a submersible pump is used to accomplish this purging. The most versatile pump of this type is the small-diameter stainless steel Johnson-Keck pump, which is battery operated and small enough to fit into two-inch diameter wells.

To avoid sample cross-contamination, E & E uses bailers constructed of Teflon, PVC, or stainless steel. Each bailer is thoroughly decontaminated before it is used in the next well. Bailer size depends on the requirements of each project. The bailers are constructed of Teflon-extruded, heavy wall tubing and are plugged at the bottom with a short length of Teflon-extruded rod (no glue is used). Water enters the bailer both from the open top and from the bottom through a 3/4-inch hole. It is prevented from flowing out of the hole by a one-inch glass marble, which rests in a conical seat machined into the top of the plug.

On-site analysis is generally restricted to pH, conductivity, and surveys for organic vapors. pH and conductivity are routinely checked during purging operations to determine steady-state conditions between the water within the well column and the existing groundwater. In areas of potential contamination, a flame ionization or photoionization instrument is routinely used to survey the groundwater during

purging and the water samples for organic vapors in order to determine the potential health hazards.

## 10.4 SAMPLING FOR OFF-SITE ANALYSIS

Sampling of groundwater for off-site analysis is conducted in the same manner as sampling for on-site analysis as described in Section 10.3, with the addition that the water samples are containerized and shipped to an outside laboratory for analysis as described in Sections 12 and 13.

# 11. DECONTAMINATION PROCEDURES

Decontamination of personnel and equipment is an important element of site safety operations. Proper decontamination prevents sample cross-contamination and contamination of personnel, vehicles, and the public; moreover, it supports quality control. Decontamination at the site involves the use of field decontamination stations for personnel, equipment, and clothing.

The decontamination process is designed to control the spread of contaminants to clean areas by physically removing or chemically neutralizing the contaminants. The following subsections delineate the basic decontamination processes for various pieces of field equipment and describe a sample personnel decontamination set-up for a Level B or C site. The actual decontamination layout is generally site-specific but would include most, if not all, of the described stations. A Level D site would involve less protective clothing and fewer stations.

Decontamination procedures normally take place in the contamination reduction area (see Figure 11-1). In this area, all equipment which entered the site is cleaned prior to moving off-site and outside of the contamination control line. Table 11-1 identifies various decontamination wash solutions which can be used depending on the site-specific hazards encountered.

## 11.1 DRILLING, SOIL SAMPLING, AND MONITORING WELL INSTALLATION

Prior to use in the field, and between sampling locations, all equipment, including the full auger rig and all auger flights, will be

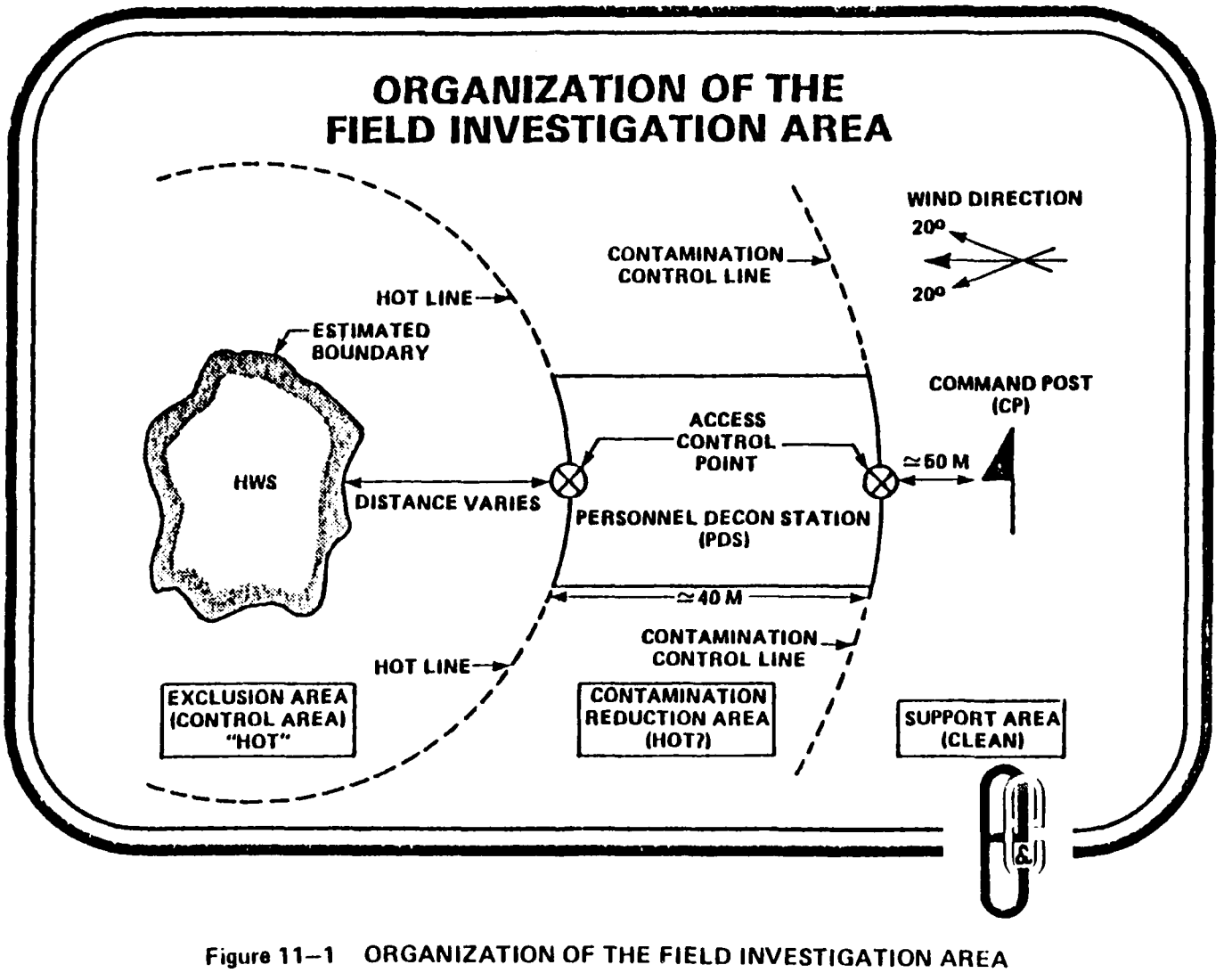


Figure 11–1 ORGANIZATION OF THE FIELD INVESTIGATION AREA

Table 11-1

USE OF GENERAL PURPOSE DECONTAMINATION SOLUTIONS

| Decon Solution | Mixing Solutions | Uses/Remarks |
|---|---|---|
| A. An aqueous solution containing a low-sudsing detergent | Follow the mixing instructions written on the particular product label | Generally has the widest range of use; best choice on sites where contaminant is unknown or a wide range of contaminants exists |
| B. An aqueous solution containing 5% sodium carbonate ($Na_2CO_3$) washing soda | To 10 gallons of water, add four pounds of sodium carbonate | Decon solution of choice for base labile compounds such as the organophosphate pesticides; effective in neutralizing inorganic acids; since sodium carbonate is a water softening agent, this characteristic is an aid in physical removal of contaminants. |
| C. An aqueous solution containing 5% sodium bicarbonate ($NaHCO_3$) baking soda | To 10 gallons of water, add four pounds of sodium bicarbonate | Sodium bicarbonate is amphoteric and can be used to neutralize either base or acid contaminants; good decon for base labile compounds |
| D. An aqueous solution containing 2% trisodium phosphate ($Na_3PO_4$) (TSP) | To 10 gallons of water, add approximately two pounds of trisodium phosphate | See uses/remarks for decon solution B above |
| E. An aqueous solution containing 10% calcium hypochlorite ($CaCl_2O_2$) (HTH) | To 10 gallons of water, add eight pounds of calcium hypochlorite | Cyanide salts |
| F. Ethylenediaminetetra-acetic acid (EDTA, versene, sesquestrene) | Commercial product; follow product label | EDTA is a chelating agent and is the decon solution of choice for heavy metal contaminants |
| G. An aqueous solution containing 3 to 5% citric, tartaric, oxalic acids or their respective sodium salts | To 10 gallons of water, add four pounds citric, tartaric, or oxalic acid | These compounds are chelating agents and are the decon solution of choice for heavy metal contaminants |

decontaminated using the following cleaning procedures. At least 200 feet of auger will be dedicated to the rig prior to the initiation of drilling. Drilling will be carried out on a plastic tarp pad, nominally 20 by 20 feet. Drill cuttings will be collected on the pad during drilling. Once a hole has been completed, the used augers will be fully cleaned on the pad and the washings will be collected in the cuttings on the pad. The cleaned augers will be returned to the working rig.

The equipment washing procedure is as follows:

- The auger flight will be steam-cleaned.
- The auger flight will be fully rinsed with methanol, an organic solvent that is easily volatilized, is not a priority pollutant, and therefore cannot introduce extraneous contamination to the site.
- The auger will be thoroughly rinsed with distilled water and allowed to air-dry.

All soil sampling equipment including split spoons, stainless steel spatulas, screens, and pans will be decontaminated by washing in laboratory-grade detergent, rinsing three times with tap water, rinsing with either pesticide-grade acetone or methanol, and then rinsing with ASTM Type I water. The equipment will be air-dried prior to repeated use. If weather conditions or other factors prohibit air-drying, the equipment will be dried in an oven at 105°C for 15 minutes and allowed to return to room temperature prior to use.

## 11.2 WELL DEVELOPMENT AND AQUIFER TESTING

All equipment used during well development and aquifer testing will either be cleaned/decontaminated or new prior to placement into the well. Equipment such as submersible pumps will be thoroughly decontaminated using the procedures identified in Section 11.1 Several items such as monofilament line, rope, and tubing purchased new will be rinsed with ASTM Type I water.

Following completion of well development and aquifer testing at each well, the equipment removed from the well will be considered contaminated and subject to the same decontamination process or discarded prior to use in another well.

## 11.3 WATER LEVEL MEASUREMENTS

Water level measurements will generally be taken using a steel tape or electronic water level indicator. All equipment entering the well will be washed and rinsed prior to insertion into the well according to the procedures specified in Section 11.1. Upon completion of the measurement at each well, the equipment will be subjected to the same decontamination process prior to use on any additional wells in order to prevent cross-contamination.

## 11.4 WATER SAMPLING

Water sampling equipment (pumps, bailers, glass sampling jars, etc.) will be cleaned prior to use in any sampling work according to the procedures described in Section 11.1. Following completion of sampling at a specific point, all equipment will be subjected to the same decontamination process to prevent cross-contamination between sampling points.

## 11.5 SEDIMENT SAMPLING

Sediment sampling equipment such as stainless steel scoops, sieves, augers, split spoons, and dredges will be subjected to the same decontamination procedures as other field equipment both prior to and immediately following use at each sampling site.

## 11.6 PERSONNEL DECONTAMINATION

Avoidance of contamination is the first and best method for preventing the spread of contamination from a hazardous site. Every effort should be made to prevent direct contact with the contaminant. Careful planning, knowledge of the contaminant, and attention to where one puts one's hands and feet are all important. Simple common-sense rules of contamination avoidance include not sitting down, not leaning against drums or debris, and not putting equipment on the ground.

No one should enter a site alone, though all tasks should be accomplished with as few team members as possible. Thus, exposure is limited to a minimum number of team members, and the ultimate process of decontamination is simplified.

The first step in the decontamination process may well take place while the team is still on or just off the hazardous site but still in the exclusion area. This is especially true if there is known heavy ground contamination. In areas of spills or heavy leachate runoff, the protective boots will become heavily contaminated. As the team leaves these areas en route to the personnel decontamination station (PDS), a boot rinse with a detergent solution (from a pre-positioned container) will significantly reduce the spread of contamination along the egress route.

The PDS will be established within the contamination reduction area upwind of the hazardous substance site. The PDS will be located between the hot line (upwind boundary of the exclusion area) and the support (clean) area boundary. Figure 11-1 illustrates the organization of the field operations area.

The PDS provides a controlled decontamination and undressing system designed to avoid the transfer of chemical contamination from protective clothing or equipment to the individual. It must be established before the team enters the contaminated area so that members can immediately and safely cope with an emergency. Team members must be briefed on decontamination procedures prior to entering the contaminated area. When the team leaves the area, extreme care must be taken to insure that proper decontamination is performed. Failure to observe these procedures could result in personal injury.

### 11.6.1 Organization and Operation of the Personnel Decontamination Station (PDS)

The project team leader must exercise professional judgment in determining how the PDS will be organized and what decontaminants will be used. Factors he must consider include:

- The extent and type of hazard expected;
- Explosive potential;
- Meteorological conditions;

- Topography;
- Levels of protection selected; and
- Availability of equipment and supplies.

This section describes the layout of a PDS for personnel dressed in Levels B and C protection.

Set-up for Levels B and C Decontamination

Figure 11-2 illustrates a PDS designed to support personnel working in Level B or Level C protection. The following is a description of the PDS layout by station.

- Station A - Equipment Drop: A plastic ground sheet on which field equipment is placed by returning members of the work party.

- Station B - Decontamination of Outer Garments: A wash tub filled with the appropriate decontamination solution.

- Station C - Rinse of Outer Garments: A wash tub filled with a water rinse.

- Station D - Boot Removal: A bench or stool for personnel to sit on during removal of the boot covers; and a plastic-lined container for disposal of booties.

- Station E - Glove Decontamination and Rinse: A portable table containing a small bucket of decontamination solution and water rinse.

- Station F - Boot Decontamination and Rinse: A small bench or stool for personnel to sit on during decontamination; a wash tub containing the appropriate decontamination solution; a wash tub containing a water rinse; and a small can for disposal of masking tape.

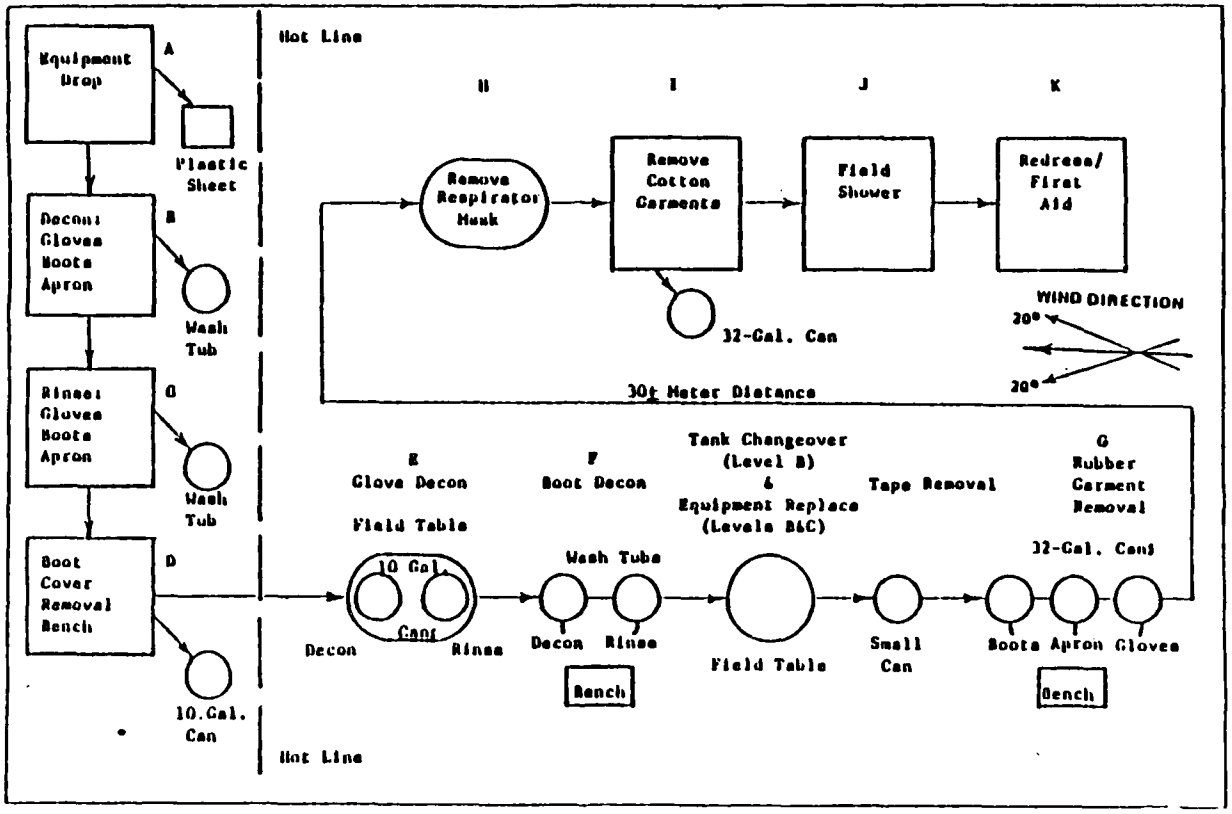


Figure 11–2 TYPICAL LAYOUT OF PDS FOR LEVEL B AND C PROTECTION

- Station G - Boot and Outer Garment Removal: A bench or stool to sit on during removal of boots, aprons, and gloves; and three 32-gallon plastic-lined containers for segregating boots, aprons, and gloves.

- Station H - Removal of Respirator: A portable table approximately 30 meters upwind from Station G on which the self- contained breathing apparatus or air-purifying respirators are placed.

- Station I - Removal of Cotton Garments: A 32-gallon plastic-lined container for disposal of all cotton garments.

- Station J - Field Shower (Optional): A field shower set-up. If impractical or not available, a wash point (container of water, soap, and paper towels) should be provided.

- Station K - Redress and First Aid (Optional): A location to redress and render first aid as necessary. This station separates the contamination reduction area from the support (clean) area.

Levels B and C Decontamination Equipment and Procedures

Station A. Equipment such as instrumentation, sample jars, and sampling devices removed from the hazardous site should be placed on the equipment drop at this station. The plastic sheet used for this purpose is positioned on the downwind side of the hot line just inside the exclusion area. Equipment should be decontaminated by PDS operators only after all work party members have been processed through the PDS. Gross contamination can be removed from equipment either by carefully stripping off protective covers such as plastic bags or through a wash process using an appropriate decontamination solution and water. Protective covers which are removed from the equipment can be placed in the same container as the disposable booties at Station D. Equipment should be thoroughly decontaminated before taking it across the hot line.

Station B. This station is the initial and most critical step in the personnel decontamination process. The individual being decontaminated should be directed to stand in the wash tub while the PDS operator, using long-handled brushes, carefully decontaminates all outer rubber garments. Care should be exercised when decontaminating personnel wearing Level B and Level C protection to avoid splashing with decontamination solution.

Station C. This station is a rinse station. Again, the individual being decontaminated should be directed to stand in the wash tub. Care again must be exercised in rinsing the rubber garments.

Station D. Prior to crossing the hot line, the work party member should remove disposable booties and place them in the receptacle located at this station.

Station E. At this station, work party members will decontaminate and rinse their gloves. A field table is recommended to elevate the decontamination and rinse solution to waist height.

Station F. Work party members will sit on the bench provided while PDS operators will sequentially decontaminate and rinse the boots. The small container located between Stations F and G is used to dispose of all used masking tape.

Station G. Work party members will sit on the bench provided and sequentially remove their boots, apron, and gloves.

Station I. The individual will remove all cloth undergarments such as coveralls, socks, and underwear, and place them in the container provided.

Station J. This station is a field shower facility. If a shower is not available, personnel should as a minimum wash their hands and faces before leaving the site. Personnel should be instructed that a shower is required to complete the decontamination process.

Station K. After showering, work party members will redress into clean clothes and receive first aid (e.g., treatment of minor cuts and bruises), if required. The individual then leaves the PDS and moves into the support area.

### 11.6.2 Preparation of Decontamination Solutions

Ideally, the decontamination solution used should react with and chemically neutralize the contaminants found at a hazardous substance site. However, since the contaminants on a particular site will be unknown in most cases, a decontaminant is more often chosen based on its ability to physically remove (dissolve or suspend) the contaminant in question.

In all decontamination operations water is a recommended solvent. Organic solvents dry the skin and are often more toxic than the hazard one is trying to eliminate. These solvents also accelerate the deterioration and penetration of protective clothing. Water, on the other hand, does not damage protective clothing and does not contribute to secondary contamination.

It must be recognized that there are no universal decontaminants and the project team leader will often be required to make a professional judgment regarding this matter. Table 11-1 lists chemical mixtures suggested as readily available general-purpose decontaminants. Their application and instructions for preparation are also presented in the table.

### 11.6.3 Closure of the PDS

When the PDS is no longer needed, it should be closed down by the PDS operators. All disposable clothing and plastic sheeting used during the operation should be double-bagged and either contained on-site or removed to an approved off-site disposal facility. Decon and rinse solution could be discarded on-site or also removed to an approved disposal facility. Reusable rubber clothing should be dried and prepared for future use. (If gross contamination has occurred, additional decontamination of these items may be required.) Cloth items should be bagged and removed from the site for final cleaning. All wash tubs, pails, containers, etc., should be thoroughly washed, rinsed, and dried prior to removal from the site.

# 12. SAMPLE HANDLING AND PACKING

## 12.1 SPLIT SAMPLE PROCEDURES

When split samples are requested, identical sample tags will be attached by E & E personnel to the two (or more) containers. The E & E sample will be clearly marked as such and treated in accordance with normal procedures. Any other split samples will remain subject to chain-of-custody procedures until they are relinquished to the person requesting them. E & E personnel also may be required to comply with the custodial procedures preferred by the person requesting the split samples; these procedures will be complied with on a case-by-case basis. All split samples will be documented in the site logbook.

## 12.2 SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

In order to preserve sample integrity either for physical, chemical, or biological analyses as well as to have a sufficient volume of each sample for analysis, all samples will be collected in the appropriate containers, preserved when required, and stored at the appropriate temperature. Various sample containers (e.g., glass, plastic) and container sizes will be used, depending on the specific analyses required. Table 12-1 lists the sample containers, preservatives, and holding times to be used to analyze for the priority pollutants listed in 40 Code of Federal Regulations (CFR) Part 136. Table 12-2 lists the sample bottles to be used, the volumes, the preservatives, and the holding times for biological parameters, physical parameters, metals, inorganic and nonmetallic compounds, and organic compounds. All of the listed sample containers, preservatives, and holding times in the tables are approved and/or recommended by EPA.

Table 12-1

RECOMMENDED SAMPLE STORAGE, PRESERVATION, AND HOLDING TIMES OF PRIORITY POLLUTANTS: EPA 40 CFR 136

| Parameter | Container* | Preservative | Holding Time |
|---|---|---|---|
| Purgeable halocarbons | A | 4°C | 7 days |
| Purgeable aromatics | A | 4°C | 7 days |
| Acrolein acrylonitrile | A | 4°C | 7 days |
| Phenols | B | 4°C | ** |
| Benzidines | B | 4°C | ** |
| Phthalate esters | B | 4°C | ** |
| Nitrosamines | B | 4°C | ** |
| Organochlorine pesticides and polychlorinated biphenlys (PCBs) | B | 4°C | ** |
| Nitroaromatics and isophorone | B | 4°C | ** |
| Polynuclear aromatic hydrocarbons | B | 4°C | ** |
| Haloethers | B | 4°C | ** |
| Chlorinated halocarbons | B | 4°C | ** |
| 2,3,7,8-tetrachloro-dibenzo-p-dioxin | B | 4°C | ** |
| Purgeables | A | 4°C | 7 days |
| Base/neutrals, acids, and pesticides | B | 4°C | ** |
| EPA 40 CFR 141: Trihalomethanes (THM) (Drinking Water) | | | |
| Tap water*** | A | 4°C | 14 days |
| Open body | A | 4°C | 14 days |

Key:

A = 40-mL clear screw-cap septum vials plus caps with 22-mm Tuf-Bond Teflon silicone discs.
B = 1/2-gallon amber glass bottle with Teflon-lined cap.

*The bottles, vials, caps, and discs listed here are those listed in EPA 40 CFR 136 (Federal Register, December 3, 1979, revised October 26, 1984) and EPA 40 CFR 141 (Federal Register, November 29, 1979).
**Extracted within seven days and analyzed within 30 days.
***If the tap water is chlorinated, 2.5 to 3.0 mg of sodium sulfite ($NA_2S_2O_3$) per 40 mL of water sample is used unless maximum trihalomethane concentration is to be determined.

Table 12-2

RECOMMENDED SAMPLE STORAGE, PRESERVATION, AND HOLDING TIMES ACCORDING TO MEASUREMENT[1]

| Parameter | Minimum Volume Required (mL) | Container[2] | Preservative | Holding Time[3] |
|---|---|---|---|---|
| **Biological Parameters** | | | | |
| Fecal coliform | 100 | Autoclaved P,G | Cool, 4°C | 6 hours |
| Total coliform | 100 | P,G | Cool, 4°C | 6 hours |
| Fecal streptococci | 100 | P,G | Cool, 4°C | 6 hours |
| Standard plate count | 100 | P,G | Cool, 4°C | 6 hours |
| Benthos (macrobenthic invertebrates) | -- | P,G | Formalin/ Glycerine | 6 months |
| Chlorophyll-a | 1,000 | P,G | Filter on-site Freeze immediately | 3 months |
| Phytoplankton | 250 | P,G | 2 mL Lugol's Solution | 6 months (darkness) |
| Zooplankton | 250 | P,G | Formalin/ Glycerine | 4 months |
| **Physical Parameters** | | | | |
| Color | 50 | P,G | Cool, 4°C | 24 hours |
| Conductance | 100 | P,G | Cool, 4°C | 24 hours[4] |
| Hardness | 100 | P,G | Cool, 4°C $HNO_3$ to pH <2 | 6 months[5] |
| Odor | 200 | G only | Cool, 4°C | 24 hours |
| pH | 25 | P,G | In situ | 6 hours |
| Residue | | | | |
| Filterable | 100 | P,G | Cool, 4°C | 7 days |
| Nonfilterable | 100 | P,G | Cool, 4°C | 7 days |
| Total | 100 | P,G | Cool, 4°C | 7 days |
| Volatile | 100 | P,G | Cool, 4°C | 7 days |
| Settleable matter | 1,000 | P,G | None required | 2 days |
| Temperature | 1,000 | P,G | In situ | No holding |
| Turbidity | 100 | P,G | Cool, 4°C | 48 hours |

Table 12-2 (Cont.)

| Parameter | Minimum Volume Required (mL) | Container[2] | Preservative | Holding Time[3] |
|---|---|---|---|---|
| Inorganics, Nonmetallics (Cont.) | | | | |
| Nitrate plus nitrite | 100 | P,G | Cool, 4°C $H_2SO_4$ to pH <2 | 24 hours[6] |
| Nitrate | 100 | P,G | Cool, 4°C | 24 hours |
| Nitrite | 50 | P,G | Cool, 4°C | 48 hours |
| Phosphorus, ortho-phosphate, dissolved | 50 | P,G | Filter on-site Cool, 4°C | 24 hours |
| Hydrolyzable | 50 | P,G | Cool, 4°C $H_2SO_4$ to pH <2 | 24 hours[6] |
| Total | 50 | P,G | Cool, 4°C $H_2SO_4$ to pH <2 | 24 hours[6] |
| Total dissolved | 50 | P,G | Filter on-site Cool, 4°C $H_2SO_4$ to pH <2 | 24 hours[6] |
| Silica | 50 | P only | Cool, 4°C | 7 days |
| Sulfate | 50 | P,G | Cool, 4°C | 7 days |
| Sulfide | 500 | P,G | 2 mL zinc acetate & NaOH | 7 days |
| Sulfite | 50 | P,G | Determined on-site | No holding |
| Organics | | | | |
| BOD | 1,000 | P,G | Cool, 4°C | 24 hours |
| COD | 50 | P,G | $H_2SO_4$ to pH <2 | 7 days[6] |
| Methylene blue active substance (MBAS) | 250 | P,G | Cool, 4°C | 24 hours |
| Nitrilotriacetic acid (NTA) | 50 | P,G | Cool, 4°C | 24 hours |
| Oil and grease | 1,000 | G only | Cool, 4°C $H_2SO_4$ or HCl to pH <2 | 24 hours |
| Organic carbon | 25 | P,G | Cool, 4°C $H_2SO_4$ or HCl to pH <2 | 24 hours |
| Phenolics | 500 | G only | Cool, 4°C $H_2SO_4$ to pH <4 1.0 g $CuSO_4$/l | 24 hours |

Table 12-2 (Cont.)

| Parameter | Minimum Volume Required (mL) | Container[2] | Preservative | Holding Time[3] |
|---|---|---|---|---|
| Inorganics, Nonmetallics (Cont.) | | | | |
| Nitrate plus nitrite | 100 | P,G | Cool, 4°C $H_2SO_4$ to pH <2 | 24 hours[6] |
| Nitrate | 100 | P,G | Cool, 4°C | 24 hours |
| Nitrite | 50 | P,G | Cool, 4°C | 48 hours |
| Phosphorus, ortho-phosphate, dissolved | 50 | P,G | Filter on-site Cool, 4°C | 24 hours |
| Hydrolyzable | 50 | P,G | Cool, 4°C $H_2SO_4$ to pH <2 | 24 hours[6] |
| Total | 50 | P,G | Cool, 4°C $H_2SO_4$ to pH <2 | 24 hours[6] |
| Total dissolved | 50 | P,G | Filter on-site Cool, 4°C $H_2SO_4$ to pH <2 | 24 hours[6] |
| Silica | 50 | P only | Cool, 4°C | 7 days |
| Sulfate | 50 | P,G | Cool, 4°C | 7 days |
| Sulfide | 500 | P,G | 2 mL zinc acetate & NaOH | 7 days |
| Sulfite | 50 | P,G | Determined on-site | No holding |
| Organics | | | | |
| BOD | 1,000 | P,G | Cool, 4°C | 24 hours |
| COD | 50 | P,G | $H_2SO_4$ to pH <2 | 7 days[6] |
| Methylene blue active substance (MBAS) | 250 | P,G | Cool, 4°C | 24 hours |
| Nitrilotriacetic acid (NTA) | 50 | P,G | Cool, 4°C | 24 hours |
| Oil and grease | 1,000 | G only | Cool, 4°C $H_2SO_4$ or HCl to pH <2 | 24 hours |
| Organic carbon | 25 | P,G | Cool, 4°C $H_2SO_4$ or HCl to pH <2 | 24 hours |
| Phenolics | 500 | G only | Cool, 4°C $H_2SO_4$ to pH <4 1.0 g $CuSO_4$/l | 24 hours |

Key:

1. More specific instructions for preservation and sampling are found with each procedure as detailed in E & E's methods manual. A general discussion on sampling of water and industrial wastewater may be found in American Society for Testing and Materials (ASTM), Part 31, p. 72-82 (1976) Method D-3370.

2. Plastic (P) or Glass (G). For metals, polyethylene with a polypropylene cap (no liner) is preferred.

3. The listed holding times are recommended for properly preserved samples based on currently available data. It is recognized that extension of these times may be possible for some sample types while, for other types, the times may be too long. When shipping regulations prevent the use of the proper preservation technique or when the holding time is exceeded, as in the case of a 24-hour composite, the final reported data for these samples should indicate the specific variance. If samples cannot be analyzed within the specified time intervals, the final reported data should indicate the actual holding time.

4. If the sample is stabilized by cooling, it should be warmed to 25°C for reading, or a temperature correction should be made and results reported at 25°C.

5. When $HNO_3$ cannot be used because of shipping restrictions, the sample may initially be preserved by icing and immediately shipped to the laboratory. Upon receipt at the laboratory, the sample must be acidified to a pH <2 with $HNO_3$ (normally 3 mL 1:1 $HNO_3$/liter is sufficient). At the time of analysis, the sample container should be thoroughly rinsed with 1:1 $HNO_3$ and the washings added to the sample (volume correction may be required).

6. Data obtained from National Enforcement Investigations Center, Denver, Colorado, support a four-week holding time for this parameter in sewerage systems (Standard Industrial Code 4952).

## 12.3 SAMPLE HANDLING AND DECONTAMINATION

E & E will identify all samples using a sample tag or other appropriate identification attached to or folded around the sample. The tag will provide the sample identification number; the date, time, and location of collection; designation of the sample as a grab or composite; notation of the type of sample and preservative; any remarks; and the signature of the sampler. E & E also will record this information in the appropriate logbook, along with any pertinent on-site measurement data and field observations.

After collection and identification, the sample will be preserved and maintained under the chain-of-custody procedures discussed below. In a similar fashion, all tags on blank or duplicate samples will be marked "Blank" or "Duplicate," respectively. Field blind duplicates will be coded and identified as such only in the field logbook.

### Chain-of-Custody Procedures

Air Force chain-of-custody requirements for this program will be clarified and incorporated in E & E's standard operating procedures. E & E will require that the possession of samples be traceable from the time the samples are collected until they are disposed of through established chain-of-custody procedures. The major elements of these E & E procedures include the following.

Sample Custody. A sample will be considered in custody if:

- It is in the individual's actual possession; or
- It is in the individual's view, after being in his/her physical possession; or
- It was in the individual's physical possession and then he/she locked it up to prevent tampering; or
- It is in a designated secure area.

Field Custody Procedures. E & E will collect only the number needed to provide a fair representation of the media being sampled. The quantity and types of samples and sample locations will be determined prior to the actual fieldwork. As few people as possible will handle the samples. The field sampler will be personally responsible for the care and custody of the collected samples until they are transferred or properly dispatched. Sample tags will be completed for each sample using waterproof ink.

Transfer of Custody and Shipment. Samples will be accompanied by a chain-of-custody record. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record will document the transfer of custody of the samples from the sampler to another person, or to an analytical laboratory.

The samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis with a separate record prepared for each laboratory. The "Courier to Airport" space on the chain-of-custody record will be dated and signed, if necessary.

All packages will be accompanied by the chain-of-custody record showing identification of the contents. The original record will accompany the shipment and a copy will be retained by E & E.

Laboratory Custody Procedures. E & E will assure that the possession of samples is traceable from the time the samples are received. To maintain and document sample possession, E & E will follow chain-of-custody procedures. A sample custodian or a designated alternate will receive samples for the laboratory and will verify that the information on the sample tags matches that on the chain-of-custody record included with the shipment. The custodian will sign the custody record in the appropriate space. Couriers picking up samples at the airport, post office, etc., will sign in the appropriate space.

Samples forwarded to the laboratories for analysis will be retained after the analyses are completed. These samples may be disposed of only upon the orders of the program manager, and only after all tags have been removed for the permanent file.

Sample Decontamination

All sampler containers will be considered as contaminated and subject to standard decontamination procedures prior to packaging in preparation for storage and/or shipment to laboratories for analysis. Decontamination procedures will include washing the container in a cleaning solution containing Alconox on TSP, followed by a thorough rinse with clean water. The samples will be immediately placed into a protective plastic wrap to prevent further possible contamination.

## 12.4 PROCEDURES FOR PACKING LOW CONCENTRATION SAMPLES

All samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements must be followed:

- Sample bottle lids are never to be mixed. All sample lids must stay with the original containers. Custody seals must be affixed.

- The sample volume level can be marked by placing the top of the label at the appropriate sample height, or with grease pencil. This procedure will help the laboratory to determine if any leakage occurred during shipment. The label should not cover any bottle preparation QA/QC marks.

- Unless otherwise specified, all sample bottles must be secured with a custody seal and placed in a plastic bag to minimize the potential for vermiculite contamination.

- Shipping coolers must be filled initially with approximately three inches of vermiculite or zonolite.

- The secured sample bottles must be placed in the cooler in such a way as to ensure that they do not touch one another.

- Low hazard samples (i.e., defined as environmental or less than 10 ppm of any single constituent) are to be cooled.

"Blue ice" or some other artificial icing material is preferred. If unavoidable, ice may be used provided that it is placed in 3-mil plastic bags. Ice is not to be used as a substitute for packing material.

- Any remaining space in the cooler should be filled in with inert packing material. Under no circumstances will locally obtained material (sawdust, sand, etc.) be used.

- The duplicate custody record must be placed in a plastic bag and taped to the bottom of the cooler lid.

## 12.5 PROCEDURES FOR PACKING MEDIUM CONCENTRATION SAMPLES

The procedures for packing medium concentration samples (defined as containing between 10 and 150,000 ppm of any constituent, or direct but diluted contamination, or material from previous spills, or discolored solid matrices or turbid liquids) are similar to those discussed in Section 12.4 with two notable exceptions. All medium hazard samples must first be placed in paint cans containing sufficient vermiculite or zonolite inert materials to cushion the sample containers and absorb spills. These paint cans are sealed, properly labelled, and then placed in the cooler or other appropriate shipping container, as described in Section 13.6. Medium hazard samples are not to be cooled with ice or some other artificial icing materials.

# 13. SAMPLE CUSTODY AND DOCUMENTATION

## 13.1 SAMPLE IDENTIFICATION DOCUMENTS

All field personnel must verify the sampling methods to be used during sample collection by making proper reference to the project plans. Prior to sampling, the field sampling personnel must ensure that all sample containers are in his physical possession or in his view at all times, or ensure that the containers are stored in a locked place at all times, so as to maintain proper custody. All sample gathering activities must be recorded in the site logbook; all sample transfers must be documented in the chain-of-custody record; all samples are to be identified with sample tags, labels, or other appropriate means of identification (hereinafter referred to as sample tags); and all sample bottles are to be sealed with custody seals. All information is to be recorded in waterproof ink. All E & E field personnel are personally responsible for sample collection and the care and custody of collected samples until the samples are transferred or properly dispatched.

## 13.2 CHAIN-OF-CUSTODY RECORDS

The custody record must be fully completed in duplicate, using black carbon paper where possible, by the field technician who has been designated by the project manager as being responsible for sample shipment to the appropriate laboratory for analysis. The information specified on the chain-of-custody record will contain the same level of detail found in the site logbook, with the exception that the on-site measurement data need not be recorded. The custody record

will include, among other things, the following information: name of person collecting the samples; date samples were collected; type of sampling conducted (composite/grab); location of sampling station; number and type of containers used; and signature of the E & E person relinquishing samples to a non-E & E person, such as a Federal Express agent, with the date and time of transfer noted. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the remarks section of the custody record.

If it is is not practicable to seal all containers at a Federal Express office, they should be sealed beforehand. The duplicate custody record will therefore have the signature of the relinquishing field technician and a statement of intent such as "To Federal Express (Baltimore office) p.m. 6/31/84." The duplicate custody record is then placed in a plastic bag, taped to the underside of the box lid, and the box closed. The container is to be tightly bound with filament tape, and if required, at the discretion of the project manager, may be padlocked. Finally, at least two custody seals are to be signed by the individual relinquishing custody and affixed in such a way that the box cannot be opened without breaking them.

At the shipping agent's office, the relinquishing individual will put all the specific shipping data (airway bill number, office, time, and date) on the original custody record which is to be transmitted to the project manager (by mail or by hand as appropriate). The original and duplicate custody records and the airway bill or delivery note together constitute a complete record and it is the project manager's responsibility to ensure that all are consistent and they are made part of the permanent job file maintained at the ASC.

At the laboratory, the sample custodian will open the package, retrieve the duplicate record, and complete the "Received for Laboratory by" box by affixing his signature. The custodian also is to fill in the "Method of Shipment" box with the shipper's name (e.g., Federal Express) and airway bill number.

## 13.3 FIELD LOG BOOKS

Site logbook(s) must be maintained for each project. All site logbooks must be bound, contain numbered pages, and be waterproof. The following documentation is to be recorded in the site logbooks: sampling locations, station numbers, dates, times, sampler's name, designation of the sample as a grab or composite, notation of the type of sample (e.g., groundwater, soil boring, etc.), preservatives used, on-site measurement data, and other field observations and remarks. Each series of site logbook entries for a particular sampling effort must be initialed by the person recording the information and, where appropriate, summary entries that organize and/or clarify data presented in the logbook are to be prepared by the person recording the information. After reviewing the entries, the field team leader must sign each page of the site logbook on the top and the bottom.

As with all data logbooks, no pages will be removed for any reason. If corrections are necessary, these must be made by drawing a single line through the original entry (in such a manner that the original entry can still be read) and writing the corrected entry alongside. The correction must be initialed and dated. Most corrected errors will require a footnote explaining the correction.

The site logbook is the prime repository of information of actual site conditions and as such is an important link in the analytical chain. Any details which may be relevant to the analysis or integrity of samples must be recorded. Preliminary sample descriptions are helpful. Any unusual circumstances should be noted, e.g., heavy rain or difficulty in pH meter calibration. At the completion of the sampling exercise, the logbook must be retained by and/or returned to the project manager and is to be made part of the permanent project file. To the extent that any information contained in the logbook is relevant to sample analysis to be performed, such data are to be made available to the laboratory performing said analyses by the project manager.

## 13.4 CORRECTIONS TO DOCUMENTATION

As with data logbooks, if corrections to any site documentation are necessary, these must be made by drawing a single line through the original entry (in such a manner that the original entry can still be

read) and writing the corrected entry alongside. The correction must be initialed and dated. Most corrected errors will require a footnote explaining the correction.

When completing any of the laboratory logs, all crossouts and/or changes in logbook entries must be made with a single line and initialed by the same custodian who is responsible for the original entry; corrections also may be supplemented by a footnoted explanation, so long as the footnote is initialed by the same custodian responsible for the original entry. This general rule may be relaxed only if the ASC director or manager authorizes such a deviation from the rule and initials the change together with the other custodian making the correction.

## 13.5 TRAFFIC REPORTS, SAMPLE LABELS, AND CUSTODY SEALS

### Traffic Reports

The documentation system provides the means to individually identify, track, and monitor each sample from the point of collection through final data reporting based on the use of sample traffic reports, each printed with a unique sample identification number. One traffic report and identification number is assigned by the sampler to each sample taken. Then, regardless of where a sample was collected or analyzed, the sample can always be identified and tracked by use of the assigned number. Traffic reports are used in conjunction with chain-of-custody and other document requirements.

To provide a permanent record for each sample collected, the sampler completes the traffic report in triplicate at the time the sample is taken. Data required include the project identification number, site location and number, dates and times when samples were taken, shipping information, name of laboratory preforming analysis, and estimated and sample concentration. The top copy becomes the sampler's file copy. The bottom two copies are sent with the samples to the designated laboratory. Upon receipt of the samples, the laboratory completes the required information concerning sample conditions and documentation. The laboratory then returns one copy to the project manager and retains a copy for their files.

Sample Tags

E & E field personnel will properly identify all samples taken in the field by using a sample tag attached to or affixed around the sample container. The sample tag must contain the field identification number; the date, time, and location of sample collection; designation of the sample as a grab or composite; notation of the type of sample (e.g., groundwater, soil boring, etc.); identification of preservatives used; any remarks; and the signature of the sampler. The sample tags are to be placed on the bottles so as not to obscure any QA/QC data on the bottles. Sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the site logbook.

Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if they are disturbed. Individual sample bottles are sealed over the cap by the sampling technician. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals are signed and dated before use. On receipt at the laboratory, the custodian will check (and certify, by completing logbook entries) that seals on boxes and bottles are intact.

## 13.6 SHIPPING OF SAMPLES

Environmental and hazardous samples will be properly packaged and labelled for shipment and dispatched to the appropriate laboratory for analysis. A separate chain-of-custody record must be prepared for each laboratory. The following requirements for shipping containers must be followed:

- United States Department of Transportation (DOT) regulations covering the transport of hazardous materials are contained in 49 CFR Parts 170-179.

- Shipping containers must be padlocked or custody-sealed for shipment, as appropriate. The package custody seal is to consist of filament tape wrapped around the package at least

twice and a custody seal affixed at appropriate access points. In this way, access to the package can be gained only by cutting the filament tape and breaking the seal.

- All of the shipping coolers/package containers must be secured by field personnel with a proper custody seal, marked with indelible pen or ink, and addressed to Ecology and Environment, Inc., Analytical Services Center, 4285 Genesee Street, Buffalo, NY 14225, or another laboratory as appropriate.

- Field personnel must make arrangements for transportation of samples to the ASC. When custody is relinquished to a shipper, E & E field personnel must telephone the ASC custodian (716/631-0360) to inform him of the expected time of arrival of the sample shipment and to advise him of any existing time constraints on sample analysis.

# 14. SITE CLEAN-UP

The objective of site clean-up is to leave the areas of investigation essentially as they were found, except of course for the physical addition of monitoring wells and guard posts. Site clean-up also includes close coordination with base personnel to insure that clean-up operations are in accordance with overall management of base operations.

E & E has responsibility for assuring the safe and proper conduct of subcontractors in this work and the associated equipment. Decontamination procedures will be conducted to insure that potential contamination remains on-site. General cleanup of equipment and vehicles will be conducted consistent with accepted Reese AFB practices and in close coordination with the Bioenvironmental Engineer (BEE).

Drill cuttings and investigation-derived wastes (e.g., expendables such as Tyvek over-suits) become the property of Reese AFB. These materials will be labeled and staged in the secure area (with assistance from the BEE) pending the results of analyses that will determine whether these wastes can be generally disposed or must be disposed as contaminated or hazardous waste.

# 15. FIELD TEAM ORGANIZATION AND RESPONSIBILITIES

Once the strategy and objectives of the work plan have been developed, a team must be organized to implement the plan. The specific techniques described in the work plan are likely to include: environmental sampling, sampling of hazardous substances, drilling operations, mapping, hazardous substance inventory, etc.

Hazardous substance sites present many hazards, physical conditions, and situations that require a wide variety of expertise and scientific support to insure safe entry and data collection. It is impractical to design a standard site entry team given the significant differences among sites. Therefore, each site requires a team tailored to the potential hazards and objectives of each specific site. The field investigation team will likely consist of individuals with various technical backgrounds, i.e., chemist, engineer, hydrogeologist, who will also fill field positions such as site safety officer or command post supervisor.

A team entering a hazardous substance site is organized for mutual support and safety. Hazardous site investigations require a complete respect for safety by all team members to prevent injury or loss of life.

## 15.1 ORGANIZATION AND RESPONSIBILITIES

There are eight roles which may be required for a field investigation team. These roles are dictated by the potential site hazards. Dual role assignments are not encouraged but may be acceptable when

hazardous substances and physical conditions at a site are well documented.

The following addresses the duties and responsibilities of the eight roles:

- Project team leader;
- Field team leader;
- Site safety officer;
- Personnel decontamination station (PDS) operator/equipment specialist;
- Command post supervisor;
- Initial entry party;
- Work party; and
- Emergency response team.

Project Team Leader

The project team leader is primarily an administrator when not participating in the field investigation as field team leader or command post supervisor. The project team leader is responsible for:

- All the team does or fails to do. Some of this responsibility may be passed on to the field team leader and site safety officer;
- Preparation and organization of all project work;
- Selection of team personnel and briefing them on specific assignments;
- Obtaining permission to enter the site from the owner;

- Coordinating with the field team leader to complete the work plan;

- Completing final reports and preparation of the evidentiary file; and

- Insuring that safety and equipment requirements are complete.

Field Team Leader

The field team leader is responsible for the overall operation and safety of the field team. As mentioned, this role can be filled by the project team leader or his designated representative. The field team leader may join the work party. He is responsible for:

- Safety and safety procedure enforcement;

- Field operations management;

- Public relations/state and federal liaison;

- Site control;

- Compliance of field documentation and sampling methods with evidence collection procedures;

- Execution of the site work plan; and

- Determination of the level of personal protection required (in conjunction with the site safety officer).

Site Safety Officer

The site safety officer has primary responsibility for all safety procedures and operations on-site. Ideally, the site safety officer will report to the person responsible for safety in the organization rather than to the field team leader or project team leader. This allows two separate lines of authority. It also allows decisions based on safety to be represented on an equal basis with decisions

based on the pressures for accomplishing the investigation according to schedule.

The site safety officer remains half-dressed in the appropriate level of protective equipment to respond to emergencies. He stays on the clean side of the exclusion area while monitoring the work party and site activities. The site safety officer is also responsible for:

- Updating equipment or procedures based on new information gathered during the site inspection;
- Upgrading the levels of protection based on site observations;
- Enforcing the "buddy system";
- Determining and posting locations and routes to medical facilities, including poison control centers; arranging for emergency transportation to medical facilities;
- Notifying local public emergency officers, i.e., police and fire department, of the nature of the team's operations, and posting their telephone numbers;
- Controlling entry (if possible) of unauthorized persons to the site;
- Entering the exclusion area in emergencies when at least one other member of the field team is available to stay behind and notify emergency services, or after he has notified emergency services;
- Examining work party members for symptoms of exposure or stress;
- Determining the suitability of a team member for work in the exclusion area, based on the team member's physical profile determined by the health and safety program and the team member's current physical condition; and

- o Providing emergency medical care and first aid as necessary on-site. The site safety officer has the ultimate responsibility to stop any operation that threatens the health or safety of the team or surrounding populace.

PDS Operator/Equipment Specialist

The PDS operator/equipment specialist functions in two roles that do not require concurrent attention. As the equipment specialist, he is charged with:

- Insuring that all equipment is poperly maintained and operating;
- Inspecting all equipment before and after use;
- Insuring that all required equipment is available: and
- Decontaminating all personnel, samples, and equipment returning from the exclusion area.

The PDS operator/equipment specialist is responsible for design and setup of the PDS and for preparing the necessary decontamination solutions to insure that chemical contamination is not transported into the clean area by inspection equipment, samples, protective clothing, or personnel. Failure to properly execute these duties reduces the effectiveness of the protective equipment and threatens the rest of the field team. The PDS operator/equipment specialist also manages the mechanics of removing contaminated clothing from the work party and the proper disposal of discarded contaminated clothing and decontamination solutions.

Command Post Supervisor

The command post supervisor functions as the clearinghouse for communications. He does not enter the exclusion area to assist the work party except for certain emergency situations. Should an emergency arise, the command post supervisor notifies emergency support personnel by phone, radio, etc., to respond to the situation.

Depending on the team size and the nature of the emergency, the command post supervisor may in extreme situations assist the site safety officer in effecting a rescue. Usually, the command post supervisor may be called upon to assist the PDS operator/equipment specialist in operating the PDS during an emergency, and assist the site safety officer in emergency medical measures. The field team leader may assume the position of command post supervisor.

The command post supervisor is also responsible for:

- Maintaining a log of communications and site activities such as duration of work periods with respirators;
- Sustaining communication and line-of-sight contact with the work party;
- Maintaining public relations in the absence of the field team leader; and
- Assisting the site safety officer and PDS operator/equipment specialist as required.

Initial Entry Party

The initial entry party enters the site first, employing special-instrumentation to characterize site hazards. Usually the field team leader should be a part of the initial entry party to familiarize himself with conditions and dangers associated with the site. The major purpose of this team is to measure existing hazards and survey the site to ascertain if the level of personal protection determined from preliminary assessment and site inspection must be adjusted.

The initial entry party can consist of as few as two people if a wheelbarrow or other device is used to transport all the instrumentation. Three or four people are able to do the job more efficiently.

Work Party

The work party performs the on-site tasks necessary to fulfill the objectives of the investigation, e.g., obtaining samples or determining locations for monitoring wells. No team member should enter or

exit the exclusion area alone. The work party consists of a minimum of two individuals, and any work party should follow this buddy system. Besides the safety considerations, it is much easier for two persons dressed in protective clothing to perform such tasks as note-taking, photographing, and sampling.

Emergency Response Team

Extensive assignments requiring long hours and large work parties (more than five) necessitate the use of a standby emergency response team. The emergency response team is half-dressed in protective gear so that it can quickly enter the exclusion area in the event of an emergency. This team is particularly valuable at dangerous sites where protective equipment produces stress and heat loads on the work party.

## 15.2 TEAM SIZE

The size of a team employed in an investigation is determined by two sometimes contradictory requirements: the need for a team large enough to maximize safety versus the desire for economy. Team size is dependent upon site organization, levels of protection, work objectives, and site hazards. Additional team members can always be added according to the roles required.

Two-Person Team

The two-person team is the minimum for a hazardous substance site investigation, but is very limited. Such a team should never enter an inactive hazardous substance site. The two-person team is best suited for off-site surveys and inspections or obtaining environmental (non-hazardous, off-site) samples. Ground truthing of aerial photographic surveys, inspection of files, or interviews can all be accomplished by the two-person team.

Three-Person Team

The three-person team can be employed on sites requiring Level C protection and, in some cases, on sites requiring Level B protection. This team is composed of field team leader; an individual fulfilling the combined functions of PDS operator/equipment specialist, site

safety officer, and command post supervisor; and another individual to enter the site with the field team leader.

The three-person team is used where extensive PDS procedures are not required and where the likelihood of emergency rescue is low. This field investigation team is best utilized in non-IDLH (immediately dangerous to life and health) atmospheres where the primary objective is to map, photograph, or inventory. Its use assumes that at no time will the work party be exposed to hazardous situations.

Considerable care and thought are necessary before a three-person team is employed on a site because each individual has numerous responsibilities. In the event of an accident, the third member does not enter the site to offer emergency assistance until he has summoned outside assistance, and even then, only when he feels rescue will not endanger his own life.

Four-Person Team

Most Level B operations can be conducted with a four-person team. These operations would include work on active sites where facility personnel are present or on inactive sites with potentially IDLH atmospheres. The objectives of a four-person team at a site requiring Level B protection might include sampling of ponds, soils, or open containers and inspections at sites known for poor housekeeping, i.e., spills, leaks, etc.

The team consists of the standard two-person work party, a combination site safety officer and PDS operator/equipment specialist, and a command post supervisor who may assist in the PDS operation. Because life-threatening hazards are assumed or known to be present at a Level B site, it is essential that all personnel be fully acquainted with their duties. During an emergency, the command post supervisor stays in the support area to maintain communication while the site safety officer/PDS operator/equipment specialist enters the exclusion area to aid the work party. Once the work party is in the contamination reduction area, the command post supervisor can then offer assistance on the PDS or provide fresh equipment from the support area.

Five-Person Team

The five-person team is the minimum size for most Level B operations or when known percutaneous hazards exist or there is an absence

of historical information. The site hazards that require Level B protection, combined with the limitations and stresses placed on personnel by wearing Level B protection, generally necessitate a full-time PDS operator/equipment specialist who can also serve in emergency response. In the event of a serious emergency such as a fire, explosion, or acutely toxic release, both the site safety officer and PDS operator/equipment specialist may need to enter the exclusion area dressed in Level B gear. The command post supervisor remains in the support area to direct outside help to the site and then assume the functions of PDS operator/equipment specialist.

Teams of Seven or More

Certain hazardous substance sites requiring sampling operations necessitate larger or alternating work parties and additional support personnel in the contamination reduction area. The seven-person team employs the basic five-person structure plus an additional work party for alternating work loads. The eight-person team includes an additional PDS operator/equipment specialist to assist in the continuous decontamination tasks involved with alternating work parties, and to decontaminate and pack samples as they are received.

It is not unusual to employ larger teams where such tasks as drum opening may require three work parties downrange working concurrently or may require a team to work under rigorous safety procedures. Larger teams can be designed with additional work parties and support personnel to safely gather the site data and insure communication and site control.

## 15.3 TRAINING

Although trained and experienced personnel are assigned, training is essential to successful project completion.

Mobilization Meeting

Before mobilization begins, a team training meeting is held to discuss assignments and the needs of the work, including equipment and health and safety requirements.

On-Site Start-Up Meeting

During site start-up, a team training meeting and site tour are conducted to review the health and safety plan, particular protocols for the project, and the project objectives. In keeping with E & E corporate health and safety policies, every site worker must complete this orientation regardless of when they begin initial site work on the project. Records are maintained of this meeting and the topics covered.

Daily Briefings and De-Briefings

Each morning a short briefing is held for all team members to outline the objectives for the day and allow health and safety monitoring. Instrument calibration checks usually occur during this time also. On sites with high potential for chemical exposure, a site survey tour would be made with monitoring instruments before fieldwork is allowed to begin. Based on current knowledge, this daily survey team is not needed for the work at Reese AFB.

At the end of each work day, a short de-briefing meeting is held to review accomplishment vs. objectives and to identify objectives for the next day's work. Data evaluation, planning, and sample management and shipping often follow this meeting.

# 16. SCHEDULE

The schedule for the investigation of the various sites in the Reese AFB Phase II Confirmation Study cannot be formulated in a realistic format until a final determination concerning sites and activities is made. At that time, schedule development will take into consideration the scheduling of concurrent site activities.

# HEALTH AND SAFETY PLAN

MEMORANDUM

TO: R. Marszalkowski-EEBUF

FROM: M. Benner-EEDAL

DATE: 8 August 1986

SUBJECT: Site Safety Plan Change-Reese AFB IRP (DF-2000)

CC: P. Jonmaire

This memorandum outlines the safety plan changes as per the telephone conversation of 6 August between Benner, Marszalkowski, and Jonmaire.

Original consideration was for the lake bottom sediment samples at the industrial and sewage lakes to be collected using a boat. This procedure was in the safety plan. However, after close inspection of the lakes and discussion regarding the intent of the samples, it is proposed that the boats not be used. Samples will be collected by wading into the lake and using a Wildco Core Sampler to retrieve the sample.

Safety gear will include chest waders, Syranex suits, and Neoprene gloves. The sampler(s) will be attached to safety lines which will be manned on shore. Distance from shore will be only far enough to reach thigh deep water or 50 feet from shore.

Rationale for this change in the safety plan is that the lake bottoms are adequate for support. Stability working from the stern of a row boat is of concern. Discussion with P. Jonmaire indicated his agreement to the change. Sampling is scheduled for 7 August.

ecology and environment, inc.

HAZARDOUS AND TOXIC MATERIALS TEAM
SITE SAFETY PLAN

## A. GENERAL INFORMATION

SITE: Reese Air Force Base Job No.: DF-2000

LOCATION: Lubbock, TX

PLAN PREPARED BY: P. Brodzik DATE: 6-11-86

APPROVED BY: Michael J. Foster /JJ DATE: 6-20-86

OBJECTIVE(S): Installation and sampling of both new and existing monitoring wells. Surface and subsurface soil sampling, Geophysics

PROPOSED DATE OF INVESTIGATION: Start 6-23-86 Complete 8/30/86

BACKGROUND REVIEW: Complete: X Preliminary: ____

DOCUMENTATION/SUMMARY: Overall Hazard: Serious: ____ Moderate: X

Low: X Unknown: X

## B. SITE/WASTE CHARACTERISTICS

WASTE TYPE(S): Liquid X Solid X Sludge X Gas X

Corrosive X Ignitable X Radioactive ____ Volatile X

Toxic X Reactive X Unknown X Other (Name) Suspect Carcinogen

FACILITY DESCRIPTION: An Air Force Pilot Training Center housing the 64th Flying Training Wing (ATC)

Principal Disposal Method (type and location): Varied: Landfills, Lagoons, and Disposal Pits

Unusual Features (dike integrity, power lines, terrain, etc.): Multiple locations of contamination

Status: (active, inactive, unknown) Active

History: (injuries; complaints; previous agency action): See Attachment A: History

## C. HAZARD EVALUATION
(Use Supplemental Sheets if Necessary)

Summary (attach copy of available chemical information from Saxs, Merck, Index, Ohmtads, etc.): Heat Stress (see Attachment B)

Heavy Metals - Pb, Cr, Cd

Chromates

Hydrocarbons - MEK, MIBK, Toluene, Acetone, Volatiles, Benzene

Pesticides

Asbestos from Demolition Waste

Fuels & Oils

Polynuclear Aromatics

Toxaphene - TLV is 0.5 $mg/m^3$-absorbed through the skin, gastroenteric tract, or through the lungs.
Carbon Tetra Chloride - TLV is 5 ppm - routes of entry are skin, eyes, and inhalation or ingestion. A probable relationship of alcohol consumption toward predisposition of the individual toward the toxic effects of carbon tetrachloride.

## D. SITE SAFETY WORK PLAN

PERIMETER ESTABLISHMENT: Map/Sketch Attached? yes Site Secured? yes

Perimeter Identified? yes Zone(s) of Contamination Identified? yes

PERSONAL PROTECTION:

Level of Protection: A ____ B ____ C X D X

Modifications: Hearing protection around drill rigs and during heavy aircraft activities, gloves and booties will be taped to Tyvek coveralls. A hard hat must be worn when working at or near the drill rig. Hooded saranex coveralls will be worn by all personnel in the Jon-Boat during water and sediment sampling.

Surveillance Equipment and Materials: HNU, OVA, Explosimeter, Oz-meter tape) mini-rad

Explosimeter-between 20% and 50% LEL continue inspection but monitor carefully. At greater than 50% LEL evacuate site immediately. At less than 19.5% and greater than 25% oxygen, evacuate site. Any depressions in the earth will be cleared with the explosimeter, $O_2$ meter prior to entry.

SPECIAL SITE CONSIDERATIONS: See Insert SS

DECONTAMINATION PROCEDURES:

Personal: Soap & water & TSP wash/Methanol Rinse (substitute another alcohol for methanol, if possible, or acetone and hexane). Methanol penetrates GMC-H cartridges. Deionized water rinse.*

Equipment: Same as above with steam cleaning electrical equipment wrapped and dry deconned. (See Attachment C)

INVESTIGATION - DERIVED MATERIAL DISPOSAL: (Note - If material is proposed to be left on site, written authorization is to be received by the Project Team Leader prior to the initiation of on site activities): Material to be tested to determine if it is hazardous waste. If hazardous, disposal is the responsibility of the Air Force; if non-hazardous, material will be disposed of on-site.**

SITE ENTRY PROCEDURES: Command Post and PDS upwind of contaminated area. Both will be moved if wind shifts. Buddy system in effect.

| Team Member | Responsibility |
|---|---|
| Mike Benner | Project Manager |
| Paul Brodzik | Assistant Project Manager |
| Don Smith | Chemist |
| Bill Park | Site Safety Officer |
| | |
| Subcontractors: | |
| Roy Burson | Field Supervisor |
| Bill Long | Supervisor |
| Dala Bowlin | General Manager |
| Bob Masten | Driller |
| Rick Reed | Helper |
| Carl Richter | Helper |

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* If methanol is used, ambient air will be monitored with an OVA. APRs with combination cartridges cannot be worn.

** Containment and drumming of spoils and decon fluids.

INSERT SS

Heat stress will be monitored and recorded. All subcontractor personnel will be medically approved and trained in the use of respiratory and protective equipment. All drilling locations will be subjected to geophysical surveys to locate underground hazards prior to work. Alternate work schudules (early morning, late afternoon & evening) may be necessary to avoid the hottest part of the day.

Water and sediment samples to be taken from the Industrial Waste Lake and the Sewage Lake will be taken from a jon-boat. The Wildco Core Sampler will be used to collect sediment samples. Bottles attached to string will be used to collect water samples.

Personnel will exercise caution if working near active aircraft runway.

All Personnel in the boat will wear life vests and will be tethered to the boat. Also, safety lines will be attached to the samplers and will be held by personnel on shore. A rescue boat will be located on shore for used in an emergency.

## E. EMERGENCY INFORMATION

(Use Supplemental Sheets if Necessary)

### EMERGENCY PRECAUTIONS

| Acute Exposure Symptoms | First Aid |
|---|---|
| Hydrocarbon vapors | Fresh air, rest |
| Heat Stroke, anoxia | Rest, shade, fluids, cool body |
| | Monitor heart rate and temperature |

### LOCAL RESOURCES
(Name, Address and Phone Number)

Ambulance: On air force base medical facilities

Hospital Emergency Room: Lubbock General Hospital, 602 Indiana (806) 743-9911

Poison Control Center: 793-4366

Police (incl. Local, County Sheriff, State): Lubbock County Sheriff 741-8091

Fire Department: Lubbock County Fire Department 765-9363

Airport:

Explosives Unit:

Agency Contact (EPA, State, Local, USCG, etc.):

Local Laboratory:

UPS/Federal Express:

Client Contact: USAF: Sgt. Maj. John Tice (806) 885-3327

### SITE RESOURCES

Water Supply: On-site

Telephone: On-site

Radio: On-site

Other: Two way radios

## Emergency Contacts

1. Mr. Raymond Harbison (University of Arkansas) ..... (501) 661-5766 or 661-5767
   (501) 370-8263 (24 hour)

2. Ecology and Environment, Inc., Safety Coordinator/
   [redacted] ..... (716) 632-4491 (office)
   P. Jonmaire (716) 655-1260 (home)

## Medtox Hotline

1. Twenty-four hour answering service - (501) 370-8263

   What to Report:

   - o State: "This is an emergency."
   - o Your name, region, and site.
   - o Telephone number to reach you.
   - o Your location.
   - o Name of person injured or exposed.
   - o Nature of emergency.
   - o Action taken.

2. One of three toxicologists (Drs. Raymond Harbison, Richard Freeman, or Robert James) will contact you. Repeat the information given to the answering service.

3. If a toxicologist does not return your call within 15 minutes, call the following persons in order until contact is made:

   E & E Corporate Headquarters (EST 0830-1700) - (716) 632-4491

   a. Twenty-four hour line - (716) 631-9530

   b. Corporate Safety Director - David Dahlstrom (home - (716) 741-2384)

   c. Assistant Corporate Safety Officer - Steve Sherman (home - (716) 688-0084)

## Emergency Routes

Directions to Hospital (incl. MAP) Lubbock General Hospital - Exit base on 4th Street and continue on 4th toward Lubbock for 7.4 miles. Hospital on right at intersection of 4th and Indiana. Emergency Room Entrance on East side of hospital.

Other Base medical facilities will be notified of on-site chemicals to assure that they are capable of treating exposed personnel.

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## F. EQUIPMENT CHECKLIST

### PROTECTIVE GEAR

#### LEVEL A

| | |
|---|---|
| SCBA | ___ |
| SPARE AIR TANKS | ___ |
| ENCAPSULATED SUIT | ___ |
| SURGICAL GLOVES | ___ |
| NEOPRENE SAFETY BOOTS | ___ |
| BOOTIES | ___ |
| GLOVES (TYPE_____) | ___ |
| OUTER WORK GLOVES | ___ |
| HARD HAT | ___ |
| CASCADE SYSTEM | ___ |
| _____ | ___ |
| _____ | ___ |
| _____ | ___ |
| _____ | ___ |

#### LEVEL B

| | |
|---|---|
| SCBA | ___ |
| SPARE AIR TANKS | ___ |
| CHEMICAL RESISTANT COVERALLS | ___ |
| PROTECTIVE COVERALL (TYPE_____) | ___ |
| RAIN SUIT | ___ |
| BUTYL APRON | ___ |
| SURGICAL GLOVES | ___ |
| GLOVES (TYPE _____) | ___ |
| OUTER WORK GLOVES | ___ |
| NEOPRENE SAFETY BOOTS | |
| BOOTIES | |
| HARD HAT WITH FACE SHIELD | ___ |
| CASCADE SYSTEM | ___ |
| MANIFOLD SYSTEM | ___ |

#### LEVEL C

MSA

| | |
|---|---|
| ULTR-TWIN RESPIRATOR | X |
| POWER AIR PURIFYING RESPIRATOR | ___ |
| CARTRIDGES (TYPE GMC-H,GMP) | X |
| ROBERTSHAW ESCAPE MASK | ___ |
| CHEMICAL RESISTANT COVERALLS | ___ |
| PROTECTIVE COVERALL (TYPE Tyvek/Saranex) | X |
| RAIN SUIT | ___ |
| BUTYL APRON | ___ |
| SURGICAL GLOVES | X |
| GLOVES (TYPE Butyl, Nitrile | X |
| OUTER WORK GLOVES | ___ |
| NEOPRENE SAFETY BOOTS | X |
| HARD HAT WITH FACE SHIELD | X |
| Booties | X |

#### LEVEL D

MSA

| | |
|---|---|
| ULTRA-TWIN RESPIRATOR (AVAILABLE) | X |
| CARTRIDGES (TYPE GMC-H,GMP) | X |
| ROBERTSHAW ESCAPE MASK (AVAILABLE) | ___ |
| CHEMICAL RESISTANT COVERALLS | ___ |
| PROTECTIVE COVERALL (TYPE Tyvek/Saranex) | X |
| RAIN SUIT | ___ |
| NEOPRENE SAFETY BOOTS | X |
| BOOTIES | X |
| WORK GLOVES Butyl, Nitrile | X |
| HARD HAT WITH FACE SHIELD | X |
| SAFETY GLASSES | ___ |
| Latex Gloves | X |
| Hearing Protection | X |

| INSTRUMENTATION | | DECON EQUIPMENT (CONT.) | |
|---|---|---|---|
| OVA | X | PLASTIC SHEETING | X |
| THERMAL DESORBER | | TARPS | |
| O2/EXPLOSIMETER | X | TRASH BAGS | X |
| EXPLOSIMETER CALIBRATION KIT | X | TRASH CANS | X |
| HNU | X | MASKING TAPE | X |
| VICTOREEN 471 | | DUCT TAPE | X |
| MAGNETOMETER | X | PAPER TOWELS | X |
| PIPE LOCATOR | | FACE MASK | X |
| WEATHER STATION | | FACE MASK SANITIZER | X |
| DRAEGER PUMP | X | FOLDING CHAIRS | X |
| BRUNTON COMPASS | | STEP LADDERS | |
| EM-51 | X | | |
| | | | |

| FIRST AID EQUIPMENT | | SAMPLING EQUIPMENT | |
|---|---|---|---|
| FIRST AID KIT | X | Augers | X |
| OXYGEN ADMINISTRATOR | | Split Spoons | X |
| STRECHER | | Wildco Core Sampler | X |
| PORTABLE EYE WASH | | Drager Tubes-Methylene Chlorice | X |
| BLOOD PRESSURE MONITOR | X | | |
| RADIATION BADGES | X | | |
| FIRE EXTINGUISHER | X | | |
| | | | |
| | | | |

| DECON EQUIPMENT | |
|---|---|
| WASH TUBS | X |
| BUCKETS | X |
| SCRUB BRUSHES | X |
| PRESSURIZED SPRAYER | |
| DETERGENT (TYPE Commercial ) | X |
| SOLVENT (TYPE Methanol ) | X |
| HTH, Sodium Bicarbonate Power | X |

| VAN EQUIPMENT | |
|---|---|
| TOOL KIT | X |
| HYDRAULIC JACK | |
| LUG WRENCH | |
| TOW CHAIN | |
| VAN CHECK OUT | |
| GAS | |
| OIL | |
| ANTIFREEZE | |
| BATTERY | |
| WINDSHIELD WASH | |
| TIRE PRESSURE | |
| | |
| | |
| | |

| MISCELLANEOUS | |
|---|---|
| PITCHER PUMP | |
| SURVEYOR'S TAPE | |
| 100. FIBERGLASS TAPE | X |
| 300 NYLON ROPE | X |
| NYLON STRING | |
| SURVEYING FLAGS | X |
| FILM | X |
| WHEEL BARROW | |
| BUNG WRENCH | |
| SOIL AUGER | X |
| PICK | X |
| SHOVEL | X |
| CATALYTIC HEATER | |
| PROPANE GAS | |
| BANNER TAPE | |
| SURVEYING METER STICK | |
| CHAINING PINS & RING | |
| TABLES | X |
| WEATHER RADIO | |

| MISCELLANEOUS (CONT.) | |
|---|---|
| BINOCULARS | |
| MEGAPHONE | |
| Camera | X |
| 2-way radios | X |
| Jon-Boat | X |
| Life Vests | X |
| Safety Belts | X |
| Oars | X |

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## HAZARD EVALUATION OF CHEMICALS

Chemical Name Methy Ethyl Ketone Date _____

DOT Name/U.N. No. _____ Job No. _____

CAS Number _____

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline (Chris (Vol. II))

Toxic and Hazardous Safety Manual ACGIH Other: _____

Chemical Properties: (Synonyms: 2-Butanone, Ethyl Methyl Ketone)

Chemical Formula $CH_3COCH_2CH_3$ Molecular Weight 72.11

Physical State Liquid Solubility ($H_2O$) _____ Boiling Point 79.6 Degrees C

Flash Point 20°FC.C Vapor Pressure/Density 71.2 mm Freezing Point -86.3 Degrees C

Specific Gravity .806 @ 20° C Odor/Odor Threshold 10 ppm Flammable Limits 1.8%-11.5%

Incompatabilities _____

Biological Properties:

TLV-TWA 200 ppm-590 mg/$m^3$ PEL _____ Odor Characteristic Like acetone

IDLH _____ Human _____ Aquatic 5640 mg/L/48hr Rat/Mouse $LD_{50}$ 3400 mg/kg

Route of Exposure Inhalation, ingestion, direct contact

Carcinogen _____ Teratogen _____ Mutagen _____

Handling Recommendations: (Personal protective measures)

Impermeable clothes, gloves, boots; eye protection (face shields);
respirators with organic vapor cartridges at 10 ppm; SCBA at 200 ppm.

Monitoring Recommendations:

Disposal/Waste Treatment:

Health Hazards and First Aid:

Inhalation: remove to fresh air, perform artificial respiration if needed
Eyes: wash with plenty of water for at least 15 min.

Symptoms: Acute: Irritating to eyes, nose, throat; nausea; vomiting;
headache; dizziness; difficulty breathing; loss of consciousness.

Chronic: _____

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(12/83,DLD)

ecology and environment, inc.

HAZARD EVALUATION OF CHEMICALS

Chemical Name Methyl Isobutyl Ketone Date _____

DOT Name/U.N. No. _____ Job No. _____

CAS Number _____

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline (Chris (Vol. II))

Toxic and Hazardous Safety Manual ACGIH Other: _____

Chemical Properties: (Synonyms: Hexone, Isopropylacetone, 4-methyl-2-pentanone, MIBK, Isobutyl Methyl Ketone

Chemical Formula $(CH_3)_2CHCH_2COCH_3$ Molecular Weight 100.16

Physical State Liquid Solubility ($H_2O$) _____ Boiling Point 116.2°C

Flash Point 73°F C.C Vapor Pressure/Density 10 mm Freezing Point -84.°C

Specific Gravity .806 @20°C Odor/Odor Threshold .47 ppm Flammable Limits 1.4%-7.5%

Incompatabilities _____

Biological Properties:

TLV-TWA 100 ppm PEL _____ Odor Characteristic Pleasant; Ketonic

IDLH _____ Human $TCL_0$ 25 ppm Aquatic - Rat/Mouse $LD_{50}$ 1120 mg/kg

Route of Exposure _____

Carcinogen _____ Teratogen _____ Mutagen _____

Handling Recommendations: (Personal protective measures)

Impermeable clothes, gloves, boots; eye protection (face shields); respirators with organic vapor cartridges at .47 ppm; SCBAs at 100 ppm.

Monitoring Recommendations:

Disposal/Waste Treatment:

Health Hazards and First Aid:

Inhalation: remove to fresh air; artificial respiration if needed

Skin or Eyes: wash eyes thoroughly with water; wash skin with water until irritation stops.

Symptoms: Acute: Irritation of eyes, nose.

Chronic: _____

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(12/83,DLD)

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## HAZARD EVALUATION OF CHEMICALS

Chemical Name Kerosene Date

DOT Name/U.N. No. Job No.

CAS Number

References Consulted (circle):

NIOSH/OSHA Pocket Guide Verschueren Merck Index Hazardline (Chris (Vol. II))

Toxic and Hazardous Safety Manual ACGIH Other:

Chemical Properties: (Synonyms: Fuel Oil No. 1, Illuminating Oil, Kerosine, Jet Fuel:JP-1)

Chemical Formula $C_nH_{2n+2}$ Molecular Weight -

Physical State Liquid Solubility ($H_2O$) - Boiling Point 200-260° C

Flash Point 100°F Vapor Pressure/Density Freezing Point -45.6° C

Specific Gravity .80 @ 15° C Odor/Odor Threshold 1 ppm Flammable Limits 0.7%-5%

Incompatabilities

Biological Properties:

TLV-TWA 200 ppm/100 mg/$m^3$ PEL Odor Characteristic Fuel Oil

IDLH Human LDL 1176mg/kg Aquatic 2990 ppm/24hr Rat/Mouse 800 mg/kg

Route of Exposure Inhalation, ingestion, direct contact

Carcinogen Teratogen Mutagen

Handling Recommendations: (Personal protective measures)

Impermeable clothing, gloves, boots; eye protection (face shields); respirators with organic vapor cartridges at 1 ppm; SCBAs at 200 ppm.

Monitoring Recommendations:

Disposal/Waste Treatment:

Health Hazards and First Aid:

Aspiration: give oxygen, Ingestion: do not induce vomiting, Eyes: wash with plenty of water, Skin: wipe off and wash with plenty of soap and water

Symptoms: Acute: Irritating to skin and eyes; harmful if swallowed; coughing

Chronic: Pulmonary edema

# HAZARD EVALUATION OF CHEMICALS

Chemical Name: Acetone

Date: 4/01/85

CAS Number: 67-64-1

REFERENCES CONSULTED: NIOSH/OSHA Pocket Guide, Chris (Vol. II)

CHEMICAL PROPERTIES: (Synonyms: Dimethy ketone, 2-propanone)

Chemical Formula: $(CH_3)_2CO$

Molecular Weight: 58.08

Physical State: Liquid

Solubility ($H_2O$): Miscible

Boiling Point: 56.5°C

Flash Point: 4°F (0°C)

Vapor Pressure/Density: 400 mm/2.0

Freezing Point: -94.6°C

Specific Gravity: 0.797

Odor/Odor Threshold: 100 ppm

Flammable Limits: 12.8%, 2.6%

Incompatabilities: Strong oxidizers, acids

BIOLOGICAL PROPERTIES:

TLV-TWA: 750 ppm (1780 $mg/m^3$

Odor Characteristics: Fragrant; mint-like

Route of Exposure: Inhalation, ingestion, direct contact

PEL: 1000 ppm

IDLH: 20,000 ppm

Rat: $LD_{50}$ 9750 mg/kg

Human: $TC_{LO}$ -500 ppm

HANDLING RECOMMENDATIONS: (Personal protective measures)

Impermeable clothes, gloves, and boots; eye protection (face shields); respirators with organic vapor cartridges at levels of 750 ppm; SCBAs at 20,000 ppm

HEALTH HAZARDS AND FIRST AID:

Remove from exposure; perform artif'cial respiration if necessary; irrigate eyes with water; wash skin with soap and water; if swallowed, induce vomiting

SYMPTOMS:

Acute: Weakness; headaches; confusion; nausea; vomiting; narcosis; eye, nose, and throat irritation; skin dryness; erythemia

Chronic: Dermatitis

# HAZARD EVALUATION OF CHEMICALS

Chemical Name: Benzene

Date: 3/29/85

CAS Number: 71-43-2

REFERENCES CONSULTED: NIOSH/OSHA Pocket Guide

CHEMICAL PROPERTIES: (Synonyms: Benzol, cyclohexatriene, coal tar naptha)

Chemical Formula: $C_6H_6$

Molecular Weight: 78.08

Physical State: Liquid

Solubility ($H_2O$): 820 ppm

Boiling Point: 176°F

Flash Point: 12°F

Vapor Pressure/Density: 75 mm/2.8

Freezing Point: 42°F

Specific Gravity: 0.877

Odor/Odor Threshold: 1.5 - 5 ppm

Flammable Limits: 7.1%, 0.3%

Incompatabilities: Strong oxidizers, zinc in presence of steam, chlorine trifluoride, ozone, sulfuric acid, potassium, chromic anhydride

BIOLOGICAL PROPERTIES:

TLV-TWA: 10 ppm

Odor Characteristics: Aromatic

Route of Exposure: Inhalation, ingestion, direct contact, skin absorption

PEL: 1 ppm - 5 ppm ceiling

IDLH: 2000 ppm

Human: Carcinogen

Rat/Mouse: Carcinogen

HANDLING RECOMMENDATIONS: (Personal protective measures)

Impermeable protective clothing, gloves, and boots; eye protection; respirator required at 1 ppm; SCBAs required at 10 ppm

HEALTH HAZARDS AND FIRST AID:

If in eyes, wash immediately with large amounts of water; if on skin, wash with soap (mild detergent) and water; move person to fresh air; perform artificial respiration if breathing stopped; if swallowed, do not induce vomiting, remove by gastric lavage and catharsis

SYMPTOMS:

Acute: Excitation, euphoria, headache, drowsiness, dizziness, vomiting, delirium, unconsciousness, blurred vision, tremors, shallow respiration

Chronic: Headache, anorexia, drowsiness, nervousness, pallor, anemia, bleeding under skin and eyes, reduced clotting ability, possibly leukemia, liver and kidney damage

# HAZARD EVALUATION OF CHEMICALS

Chemical Name: Chromium

Date: 3/29/85

CAS Number: 7440-47-3

REFERENCES CONSULTED: NIOSH/OSHA Pocket Guide

CHEMICAL PROPERTIES: (Synonyms: Chrome, chromium metal, ASTM 1481)

Chemical Formula: Cr

Molecular Weight: 52

Physical State: Solid

Solubility ($H_2O$): Insoluble

Boiling Point: 4784°F

Flash Point: 752°F

Vapor Pressure/Density: 1 mm @ 1610°C

Freezing Point: 3452°F

Specific Gravity: 7.14

Flammable Limits: Nonflammable

Incompatabilities: Nonflammable strong oxidizers, acids, strong alkalies

BIOLOGICAL PROPERTIES:

TLV-TWA: 0.5 $mg/m^3$

IDLH: 500 $mg/m^3$

Carcinogen: Suspected in animals

Odor Characteristic: Odorless

PEL: 1 $mg/m^3$

Route of Exposure: Inhalation, ingestion

HANDLING RECOMMENDATIONS: (Personal protective measures)

Skin: Wear impervious clothing, gloves, and face shield. Inhalation: APR with appropriate cartridges

HEALTH HAZARDS AND FIRST AID:

Eyes: Flush with large amounts of water. Skin contact: Wash with soap or mild detergent and water. Inhalation: Move person to fresh air and give artificial respiration if necessary. Ingestion: Large quantities of water and induce vomiting

SYMPTOMS:

Acute: Pulmonary/respiratory irritation, dizziness, vomiting

Chronic: Cancer, broteimuria, hematuria, oliguria, anuria, uremia, shock

# HAZARD EVALUATION OF CHEMICALS

Chemical Name: Xylene (O-Xylene)

Date: 4/01/85

CAS Number: 1330-20-7

REFERENCES CONSULTED: NIOSH/OSHA Pocket Guide, Chris (Vol. II)

CHEMICAL PROPERTIES: (Synonyms: Xylol, dimethylbenzene)

Chemical Formula: $C_6H_4(CH_3)_2$

Molecular Weight: 106.2

Physical State: Liquid

Solubility ($H_2O$): 0.000003%

Boiling Point: 144.4°C

Flash Point: 90°F

Vapor Pressure/Density: 10 mm/3.66

Freezing Point: -25.5°C

Specific Gravity: 0.88

Odor/Odor Threshold: 0.05 ppm

Flammable Limits: 6%, 1.0%

Incompatabilities: Strong oxidizers

BIOLOGICAL PROPERTIES:

TLV-TWA: 100 ppm (435 mg/$m^3$)

IDLH: 10,000 ppm

Route of Exposure: Inhalation, ingestion, skin absorption, direct contact

PEL: 100 ppm

Rat: $LD_{50}$ 5000 mg/kg

Aquatic: >100 mg/l

HANDLING RECOMMENDATIONS: (Personal protective measures)

Impervious clothing, gloves, and boots; eye protection; respirators with organic cartridges at levels of 100 ppm; SCBAs at 10,000 ppm

HEALTH HAZARDS AND FIRST AID:

Remove from exposure; perform artificial respiration if necessary; wash skin with soap and water; irrigate eyes with water; do not induce vomiting if swallowed, seek medical attention

SYMPTOMS:

Acute: Headache, dizziness severe coughing, pulmonary edema, skin dryness, excitement, incoordination, staggering gait, anorexia, nausea

Chronic: Kidney and liver damage, decrease in red and white blood cell count (reversible), dermatitis

# HAZARD EVALUATION OF CHEMICALS

Chemical Name: Toluene

Date: 4/01/85

CAS Number: 108-88-3

REFERENCES CONSULTED: NIOSH/OSHA Pocket Guide, Merck Index, Chris (Vol. II)

CHEMICAL PROPERTIES: (Synonyms: Toluol, phenyl methane, methyl benzene)

Chemical Formula: $C_6H_5CH_3$

Molecular Weight: 92.13

Physical State: Liquid

Solubility ($H_2O$): 0.05%

Boiling Point: 110.4°C

Flash Point: 40°F

Vapor Pressure/Density: 36.7 mm/3.14

Freezing Point: -94.5°C

Specific Gravity: 0.866

Odor/Odor Threshold: 0.17 ppm

Flammable Limits: 7%, 1.27%

Incompatabilities: Strong oxidizers

BIOLOGICAL PROPERTIES:

TLV-TWA: 100 ppm (375 mg/$m^3$)

Odor Characteristics: Aromatic

Route of Exposure: Inhalation, skin absorption, ingestion, direct contact

PEL: 200 ppm

IDLH: 2000 ppm

Rat: $LD_{50}$ 4000 ppm

Human: $TC_{LO}$ 200 ppm

HANDLING RECOMMENDATIONS: (Personal protective measures)

Impermeable clothing should be worn, including gloves and boots; eye protection; respirators with cartridges worn at levels of 100 ppm; SCBAs at 2000 ppm

HEALTH HAZARDS AND FIRST AID:

Remove from exposure: administer artificial respiration if necessary; wash skin with soap and water; irrigate eyes with water; do not induce vomiting if swallowed, seek medical attention

SYMPTOMS:

Acute: Fatigue, weakness, confusion, euphoria, dizziness, headache, insomnia, muscular fatigue, dilated pupils, paresthesis of skin

Chronic: Central nervous system depression, liver and kidney damage, dermatitis

ATTACHMENT A
to Site Safety Plan

History and Overview of the Base; General Operations;
and Site-Specific Descriptions.

## 1. History and Overview of the Base

Operations at Reese Air Force Base (RAFB) began in 1941. The base openned in June 1941 as Lubbock Army Airfield. The primary operation at that time was the Training of bomber, fighter and transport pilots during World War II. The end of the war brought the end of Lubbock Army Airfield in 1945.

The site was used for National Guard for training missions and for housing facilities for veterans and their families between 1945 and 1949. In 1949 the 3500th Pilot Training Wing moved to Lubbock from Barksdale AFB and the base was renamed for First Luitenant A. F. Reese. Since 1949 RAFB has continued to operate as a pilot training facility. RAFB is currently home for the 64th Flying Training Wing (ATC).

The following operations have resulted in the generation or processing of hazardous wastes:

- Fuels management;
- Waste solvent disposal;
- Fire protection training;
- Aircraft maintenance;
- Operation of general waste management facilities.

Waste handling at RAFB has included burial, incineration, wastewater treatment, and surface impoundment. For the purpose of this investigation, RAFB has been divided into nine sites. The nine sites include:

- Site 1 - Industrial Waste Lake (SI-1)
- Site 2 - Sewage Lake (SI-2), East Landfill (D-3), North Landfill (D-4), West Landfill (D-5), and Inactive Fire Training Area (FT-3).
- Site 3 - POL Storage Area (aqua system) Spill Site (SP-1)
- Site 4 - Southwest Landfill (D-1)
- Site 5 - Civil Engineering Paint Shop Trench (SI-4)
- Site 6 - Active Fire Training Area (FT-1), Drainage Impoundment (SI-3).
- Site 7 - Northwest Landfill/Rubble Area (D-11)
- Site 8 - Hurlwood Acquisition and Landfill (D-7)
- Site 9 - Sewage Digester Sludge Spreading Area (SS-1)

## 2. General Operations

Sampling during this phase of the project will include groundwater, surface water, subsurface soils, and surface soils. E & E will install 4 monitoring wells and will make 31 soil borings. In addition, bottom sediment will be taken from the Industrial Waste Lake and the Sewage Lake.

Geophysical surveys will be performed prior to drilling to aid in the selection of safe boring locations. All borings will be monitored with the OVA or HNU during drilling to establish the level of respiratory protection required

All drilling operations will be conducted in Level C respiratory protection. Ambient air monitoring will be continuously performed using an HNU and an OVA. As dictated by the air monitoring, the level of respiratory protection may be changed. Upgrade/downgrade can be made according to the following guidelines:

. Level D - 0 PPM above background;
. Level C - anything above background to 5 PPM;

5 to 500 PPM above background, abandon site, re-evaluate and contact the Corporate Safety Director.

Air monitoring equipment will be chosen based on the type of contaminants expected and the weather conditions. The HNU has several different probes. E & E will use a probe that can photoionize the compound of interest.*

Additionally, humid air quenches ions and decreases the instrument readings, making the HNU ineffective at relative humidities over 80%. The higher the EV of the detector probe lamp, the more sensitive the instrument is to humidity quenching. Cold weather can also affect the readings on the HNU, as condensation can settle inside the probe. The OVA will be substituted under such conditions.

3. Site-Specific Descriptions

3.1 Site 1 - Industrial Waste Lake (SI-1)

Since 1942 this surface impoundment has received storm drainage and industrial waste water. Currently, the Industrial Waste Lake receives surface runoff from most of the base area. This included drainage from the flightline and the industrial shops. This waste water routinely contains paint remover, drag-out from the plating tanks containing chromium, cadmium and acids, oil and grease from the parking apron, detergents, etc. A primary concern is paint stripper which contains methylene chloride; however, previous analyses of lake water samples have contained no methylene chloride.**

* The initial survey should be made with the 10.2 EV probe. Although the 11.7 EV probe detects a greater variety of compounds, its' operating life is considerably less than that of the 10.2 EV.

** APRs with GMC-H cartridges do not provide protection from exposure to methylene chloride vapor. Therefore, during sampling on the lake, a drager pump and methylene chloride detector tubes will be used to monitor the breathing zone of site personnel. Any color changes will result in evacuation of the area. (The standard range of measurement of a methylene chloride drager tube is 100-2000 ppm. The TLV is 100 ppm.

Periodic water analyses indicate that the Industrial Waste Lake occasionally contained low concentrations of metals and volatile organic compounds. Bottom sediment and sludge samples contain several trace metals. However, E.P. Toxicity extractions indicate that these metals are in a relatively immobile form.

Four borings will be made around the periphery of the site. A magnetometer survey will be conducted prior to drilling. The borings will be located between areas D-4, D-5, FT-3, and the lake. Lake water and sediment samples will be collected from a jon-boat. All personnel will wear life vests and will be tethered to the boat. Also, safety lines will be attached to the samplers and held by personnel on shore. A rescue boat will be located at shore for use in an emergency. Level C protection will be used.

### 3.2.1 Sewage Lake (SI-2)

The sewage lake has held water since 1941, however, on several occasions the water was drained and on at least one occasion, the pond was poisoned with toxaphene to kill salamanders.

Sampling data indicate that the water quality is typical for a sewage lagoon. However, polynuclear aromatic hydrocarbons (PAH) have been detected in low concentrations. Historically, hazardous wastes have been disposed of in the Sewage Lake including: asphaltic debris from runway demolition, diesel oil, solvents, waste oils, and other industrial wastes from flightline shops.

Four borings will be made near the sewage lake. A magnetometer survey will be conducted prior to drilling. Lake water and sediment samples will be collected from a jon-boat. All personnel will wear life vests and will be tethered to the boat. Also safety lines will be attached to the samplers and held by personnel on shore. A rescue boat will be located on shore for use in an emergency. Level C respiratory protection will be used.

### 3.2.2 East Landfill (D-3)

During the 1940's open trenches located east of the Sewage Lake were used for waste disposal. Generally, these trenches ran north/south and contained construction/demolition lumber and miscellaneous trash. Most of the material was burned in the ditches, then covered over.

A magnitometer survey will be conducted to define landfill limits. Level C respiratory protection will be worn.

### 3.2.3 North Landfill (D-4)

During the 1950's and 1960's, trenches on the north side of the Sewage Lake were used for waste disposal. Wastes included waste fuels, oils, construction debris, paint chips, and solvents.

A magnetometer survey will be conducted to define landfill limits. Level C protection will be worn.

### 3.2.4 West Landfill (D-5)

Several east/west trenches were reported to have existed on the west side of the Sewage Lake. The trenches were probably used for disposal of all types of base-generated wastes that could have included industrial compounds and waste oils.

A magnetometer survey will be conducted to define the landfill limits. Level C respiratory protection will be worn.

### 3.2.5 Inactive Fire Training Area (FT-3)

This area is adjacent to the Sewage Lake but its' specific location has not been identified. Typical fire training activities consisted of emptying fuel thinners and solvents on trash in an unlined pit. The fire would be started and then put out. The unburned fuels and extinguishing agents would then be allowed to evaporate, percolate, or runoff.

A magnetometer survey will be conducted to define the landfill limits.*** Level C respiratory protection will be worn.

## 3.3 POL Storage Area (aqua system) Spill Site (SP-1)

In about 1949, a major break occurred in an underground network of tanks and piping which carried aviation gas. An estimated 1000 gallons of aviation gas were lost. Remedial actions included pumping gas from a nearby well, contaminated soil excavation, pipe repairs, soil aeration, and backfilling.

A soil gas survey will be conducted using an OVA and $O_2$ meter/explosimeter to determine boring locations. Four borings will be made at designated locations. Level C respiratory protection will be used.

## 3.4 Southwest Landfill (D-1)

This site is the only active landfill within the base proper. This site has had one or more disposal trenches at any given time since the mid-1950's. At present, only two trenches for disposal of construction type wastes are in use. However, in the past, domestic and hazardous wastes are also known to have disposed at this site. Wastes which were landfilled at this site include: waste acids, cleaning solutions, paint chips, drummed chromic acid, aircraft tire debris, lead pipe from aqua-system, ether, sludge from Industrial Waste Lake, plating tank bottom sludges containing cadmium, and pesticides.

Four soil borings will be made around the periphery of the site area. A magnetometer survey will be conducted to define the landfill limits prior to drilling.*** Level C respiratory protection will be used. APR with GMP cartridges will be worn.

*** If any drilling is conducted, the area will be monitored with an $O_2$/ explosimeter for explosive atmospheres.

### 3.5 Civil Engineering Paint Shop Trench (SI-4)

A trench (8' x 10' x 5' deep) with a gravel French Drain was used to dispose of paint thinners and cleaners. For several years in the 1960's, kerosene, toluene, acetone, and lacquer thinner (methyl alcohol) were drained into the pit.

One monitoring well will be constructed on the periphery of the site. A magnetometer survey will be conducted prior to drilling. Area will be monitored with $O_2$/explosimeter to check for explosive atmospheres. Level C respiratory protection will be used.

### 3.6.1 Active Fire Training Area (FT-1)

The fires are started using waste fuel and other flammables from the base. Until the 1970's a major compound utilized in fighting fuel fires was carbon tetra chloride. Since the mid-1970's, bromochloromethane, and bromochlorodiflouromethane have been utilized. The fire fighting compounds as well as leaded aviation gas and JP-4 (often mixed with propanediol) can be expected to be contaminants at fire training areas.

Two borings will be made around the periphery of the site. A magnetometer survey will be conducted prior to drilling.

Level C respiratory protection will be used.

### 3.6.2 Drainage Impoundment (SI-3)

This impoundment collect local runoff which includes surface drainage from a construction landfill, the southern end of runway A and the fire training area. Around the edges of the trench are deposits of ash-gray material.

Two surface soil samples will be collected from the site. Level C respiratory protection will be used.

### 3.7 Northwest Landfill/Rubble Area (D-11)

This site reportedly consists primarily of waste piles of asphaltic construction debris, resulting from runway demolition. However, early in the 1970's, thirty to fifty 55-gallon drums of material described as "too toxic for the landfill and lakes" were emptied into trenches cut into the construction debris.

Four borings will be made around the periphery of the site. A magnetometer survey will be conducted prior to drilling. Level C respiratory protection will be used.

### 3.8 Hurlwood Acquisition Area and Landfill (D-7)

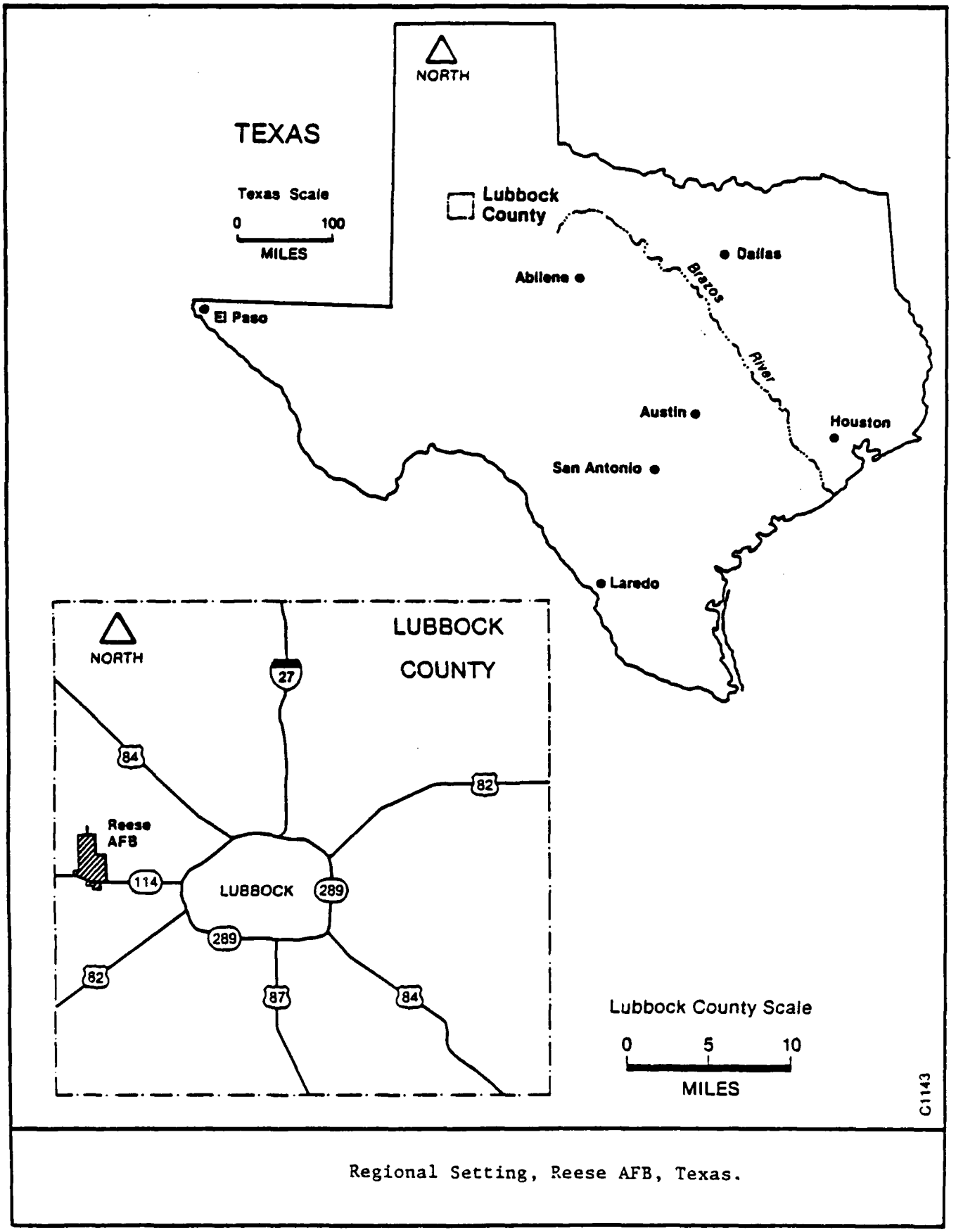
A disposal area existed behind a cotton gin that formerly occupied part of the property in Hurlwood acquired by the Air Force in 1978. The wastes disposed reportedly consisted of only non-hazardous debris including miscellaneous trash from the gin.

Two borings will be made around the periphery of the site. A magnetometer survey will be conducted prior to drilling to locate landfill limits and the presence of buried drums. Level C protection will be worn.

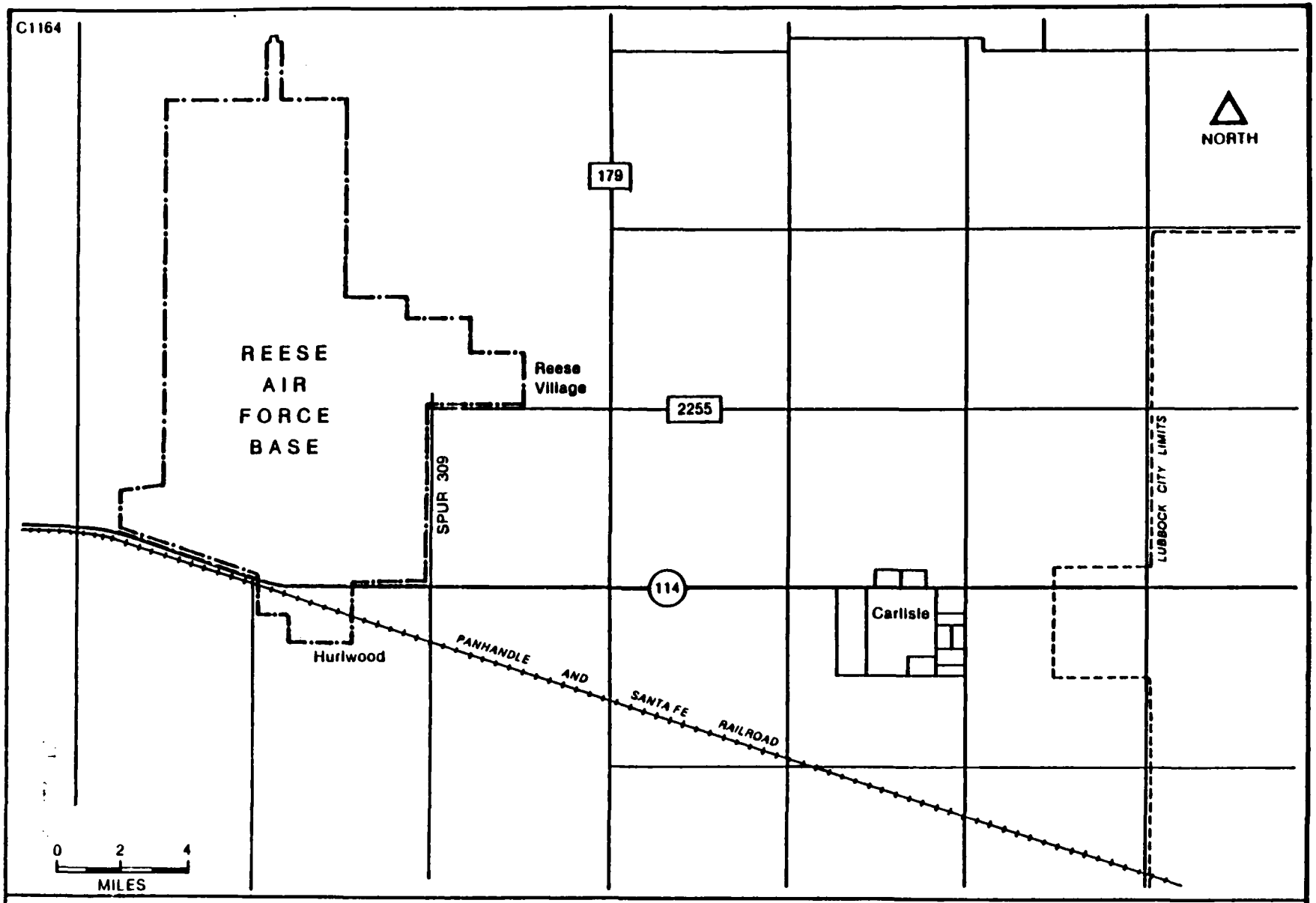
### 3.9 Sewage Digester Sludge Spreading Area (SS-1)

Currently, sludge is spread primarily along the perimeter road, the north bank of the Sewage Lake, and on the golf course greens. Analyses of sewage sludge indicate that polynuclear aromatic hydrocarbons (PAH) are a minor constituent. However, at the levels detected, the PAH's do not constitute a health hazard. A potential concern, however, is the suggestion that at some time prior to 1976, mixing of chromic acid with sewage sludge was a procedure used for waste acid disposal.

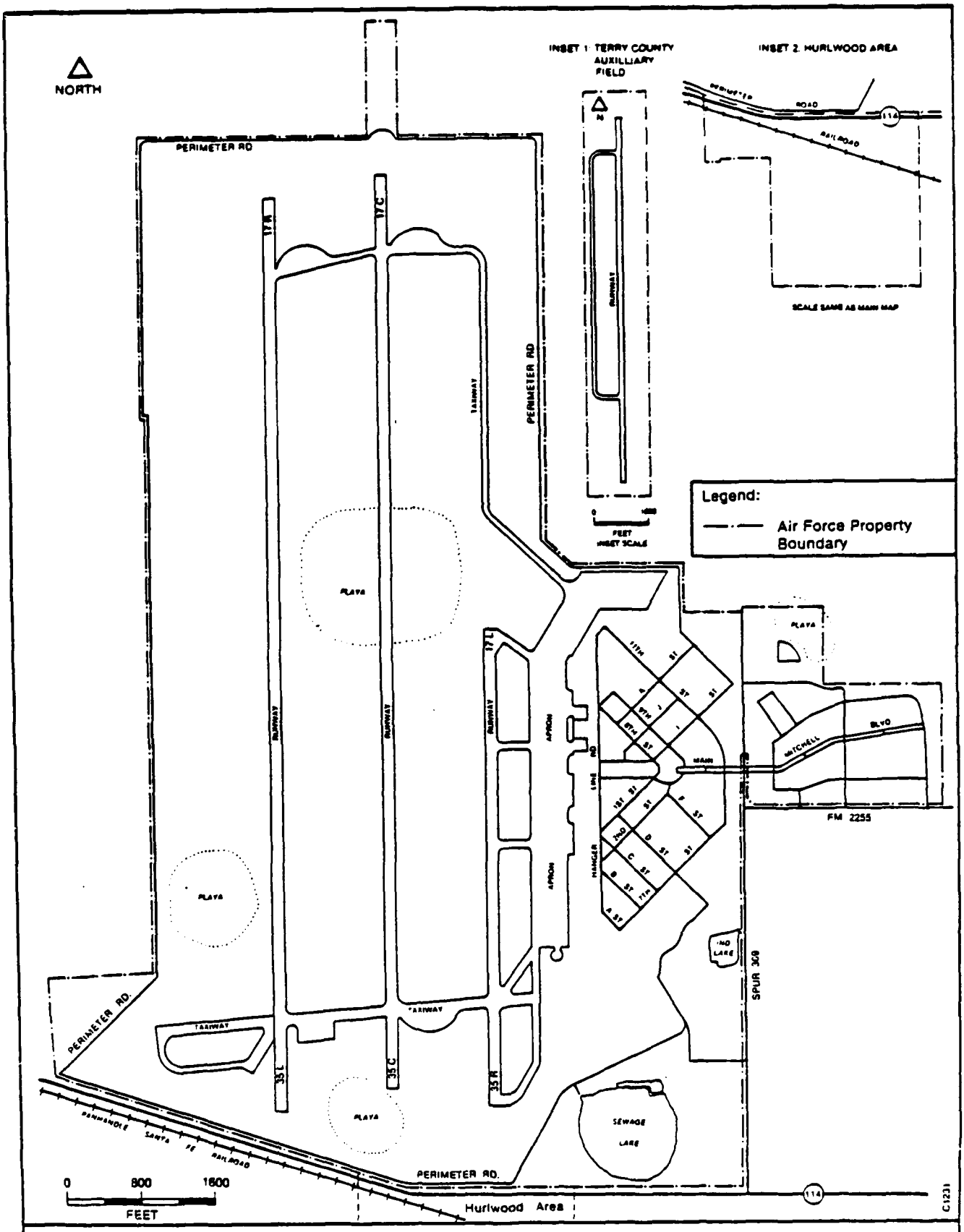
Ten borings will be made between 1st and 2nd Streets. A magnetometer survey will be conducted prior to drilling. Level C respiratory protection will be used.



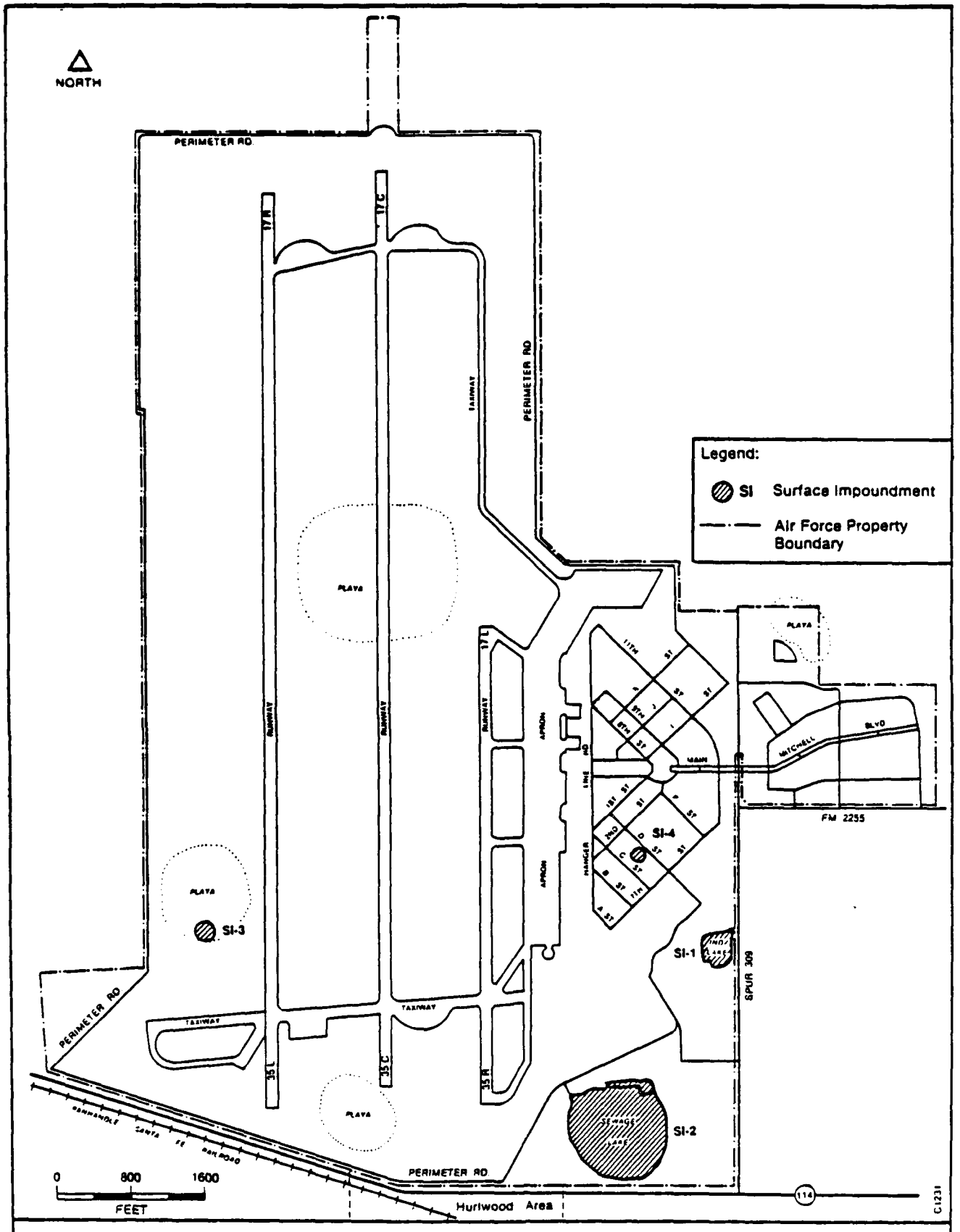

Regional Setting, Reese AFB, Texas.



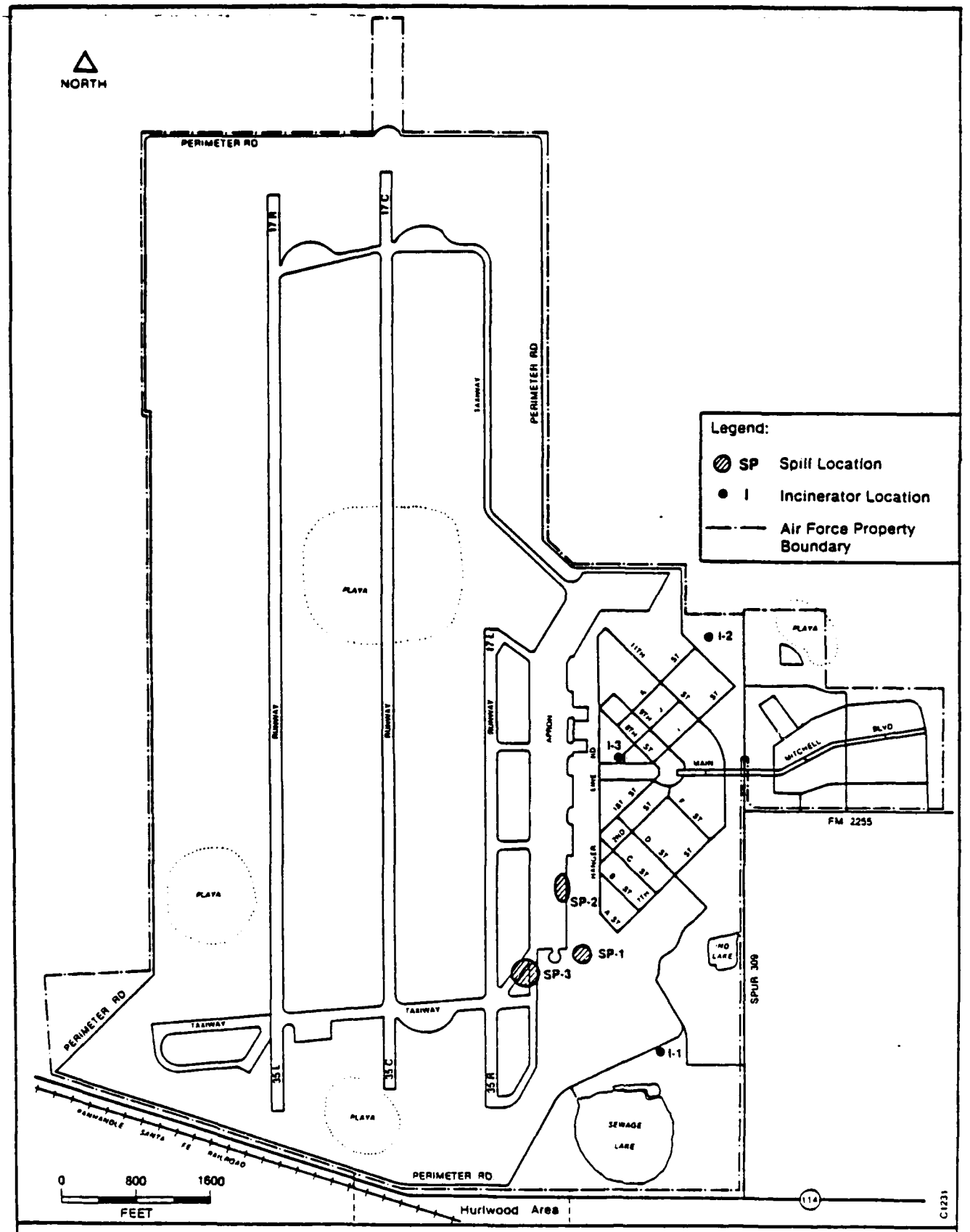

Reese AFB and Surrounding Area.



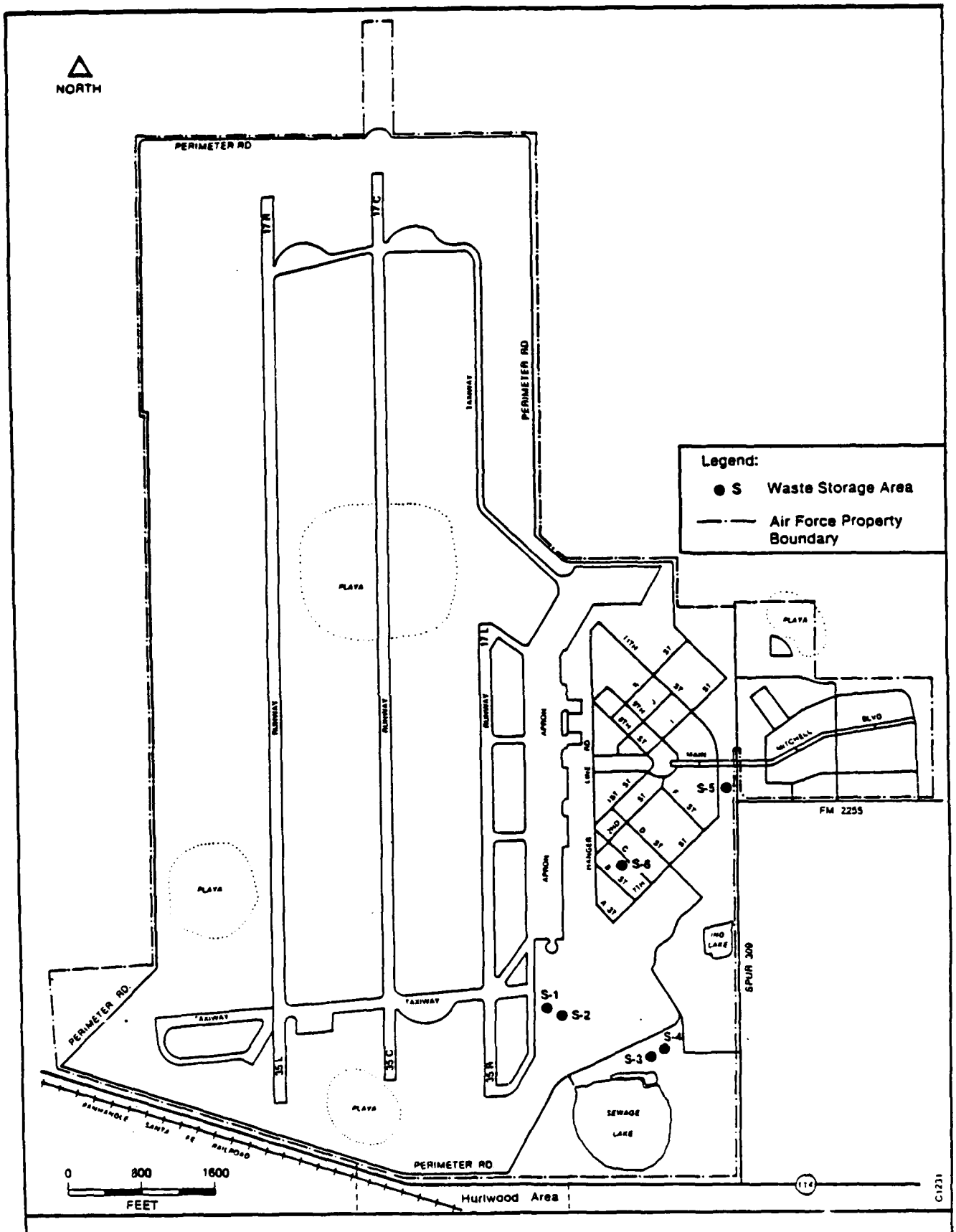

Generalized Layout of Reese AFB, Texas.



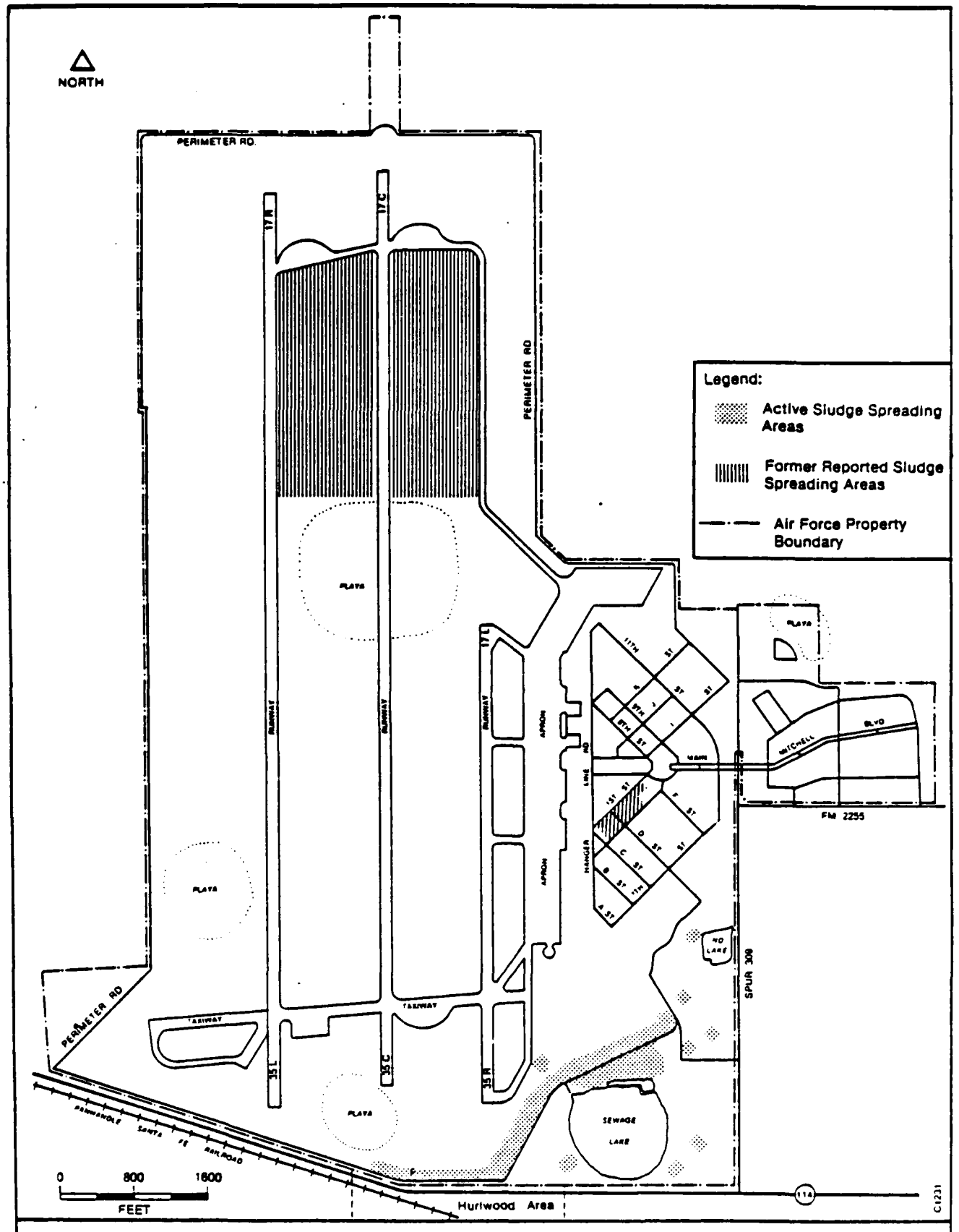

Locations of All Identified Surface Impoundments, Reese AFB, Texas.



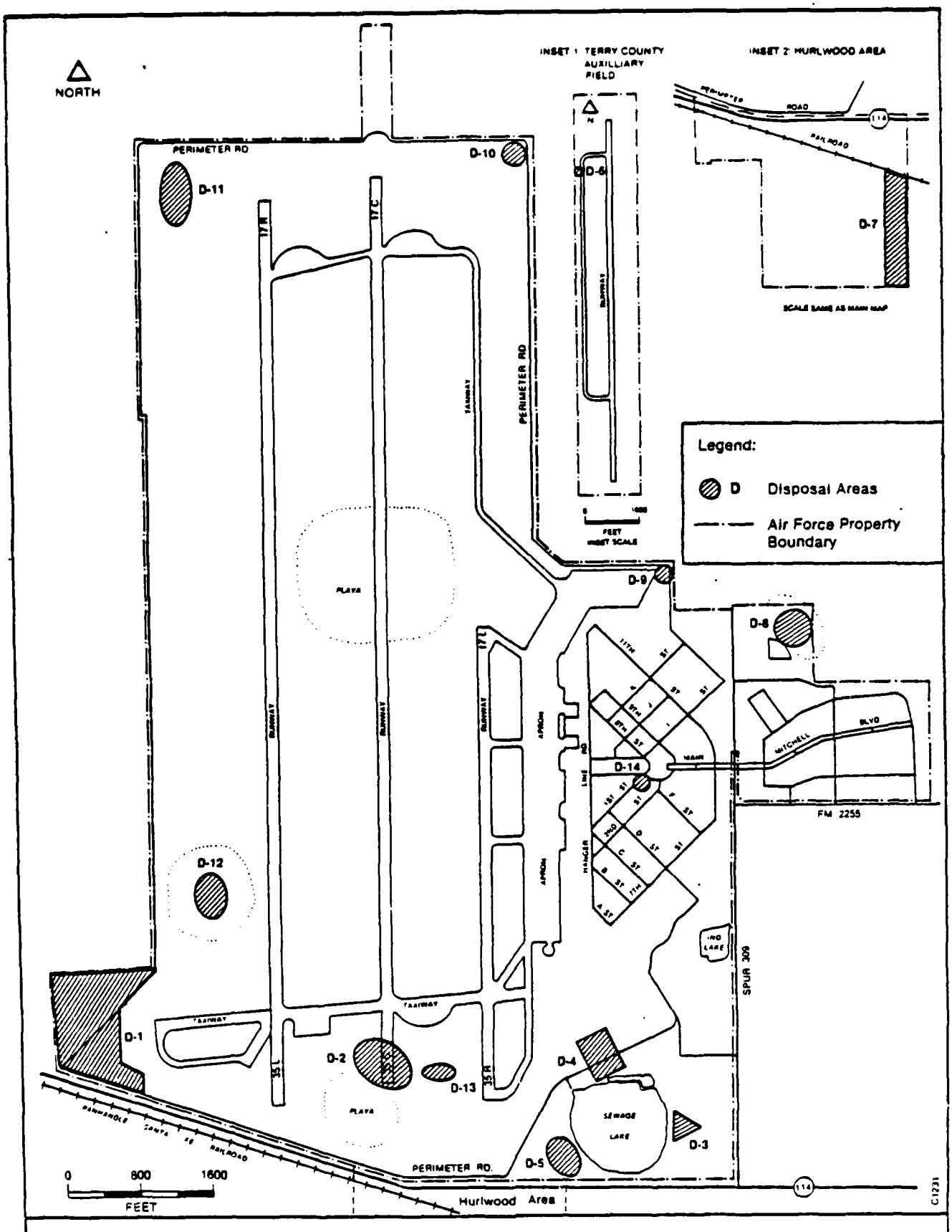

Locations of All Identified Fuel Spills and Incinerators, Reese AFB, Texas.



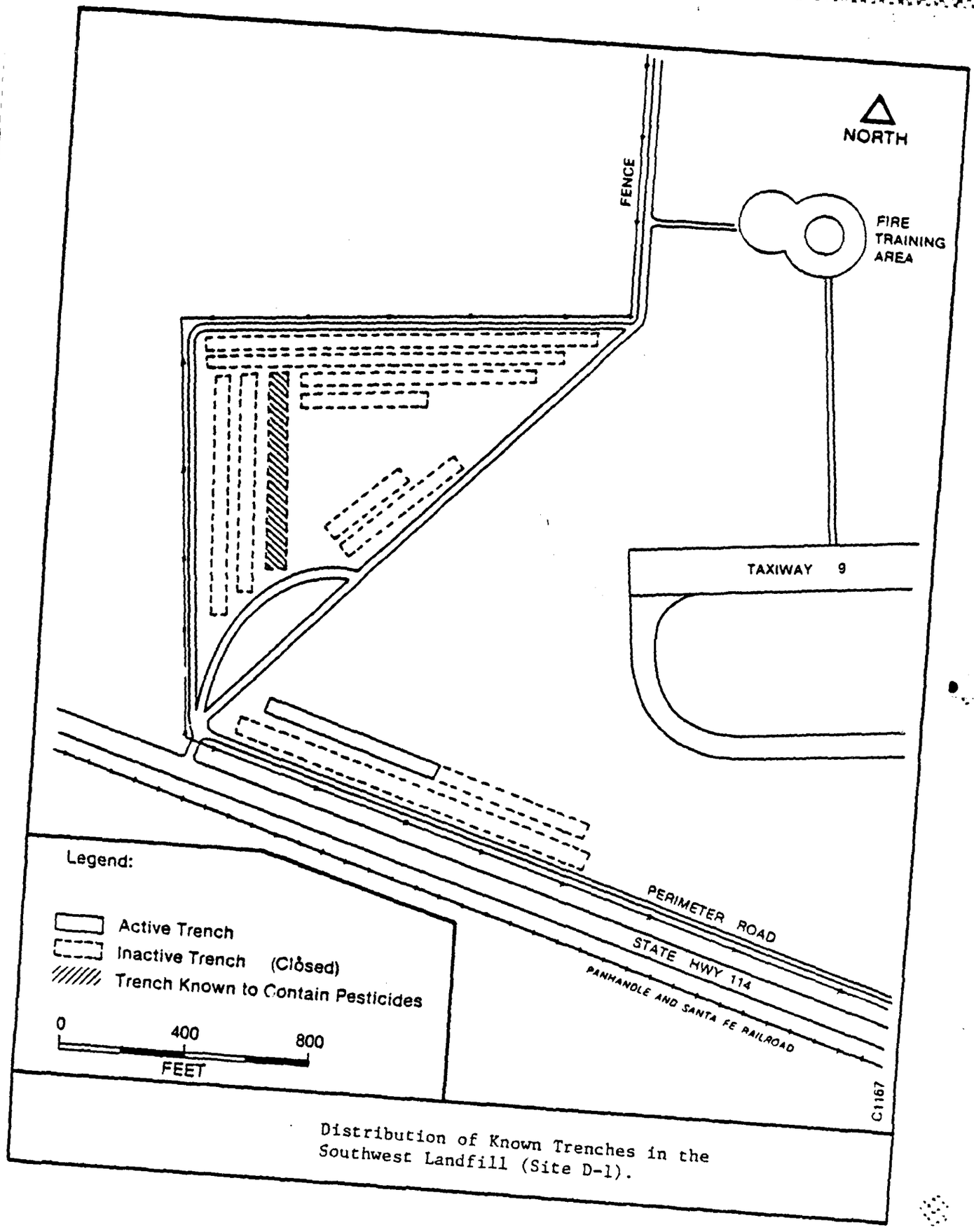

Locations of All Identified Waste Storage Areas, Reese AFB, Texas.



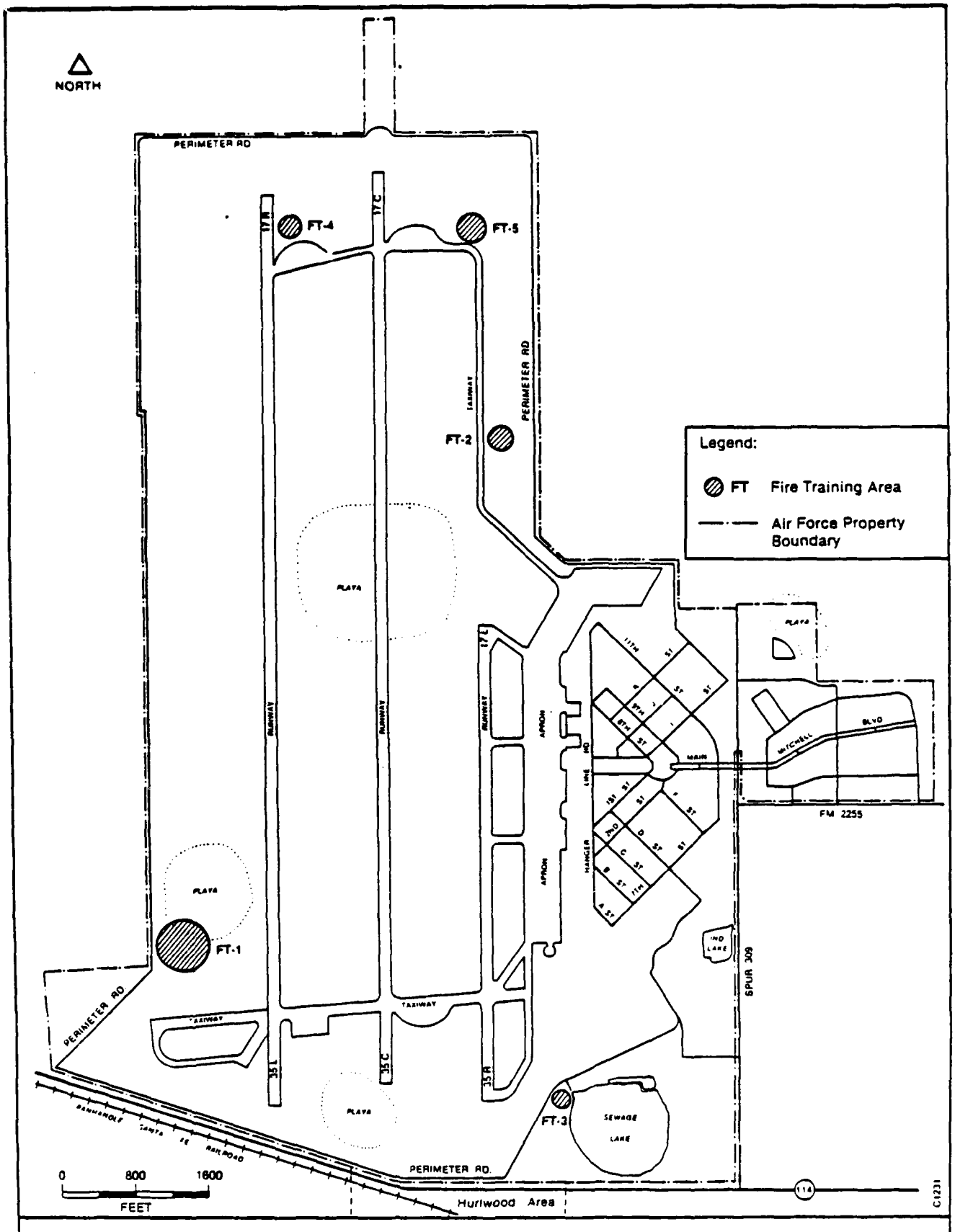

Locations of Sewage Digester Sludge Spreading Areas, Reese AFB, Texas.



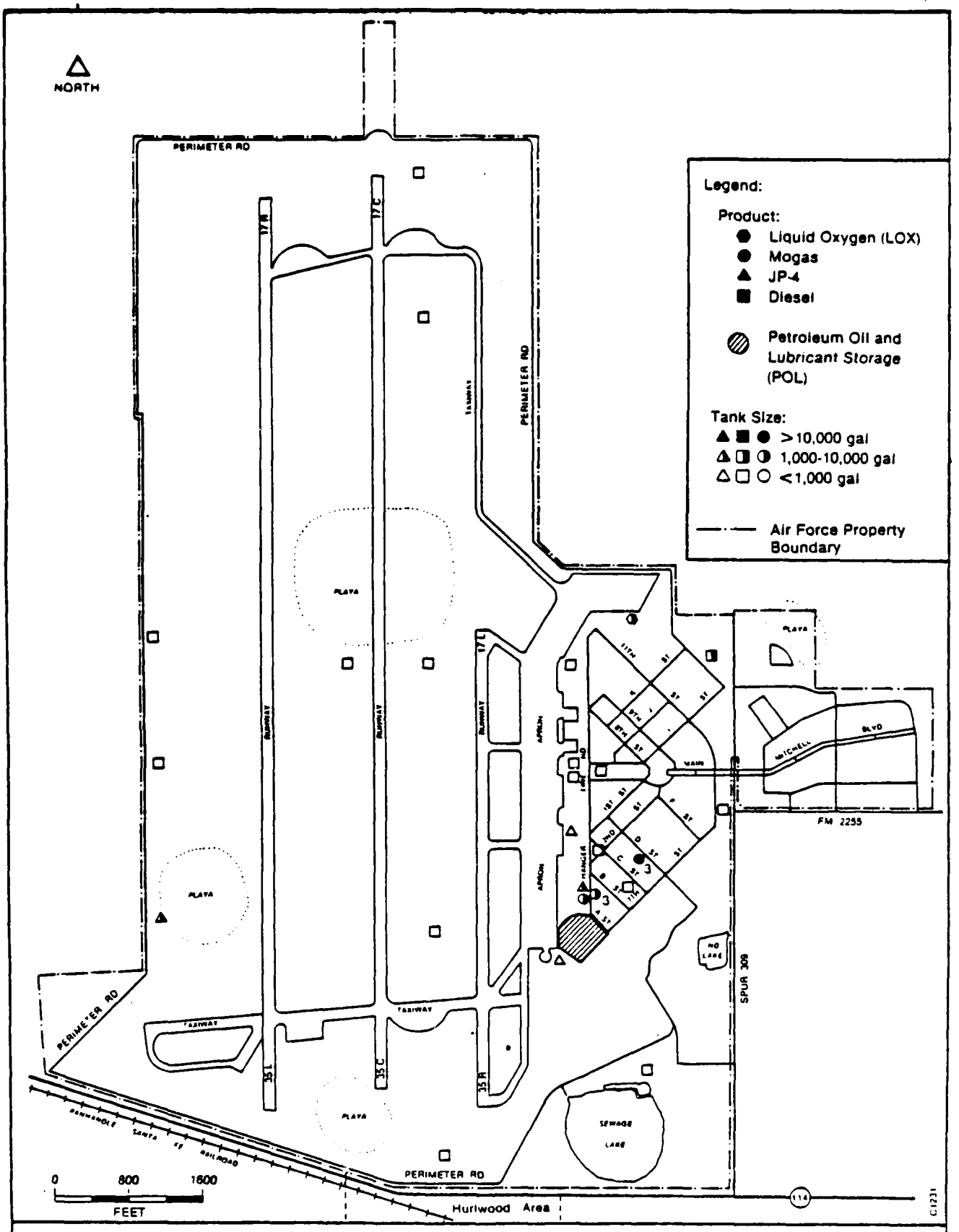

Locations of All Identified Landfills and Rubble Areas, Reese AFB, Lubbock and Terry Counties, Texas.




Distribution of Known Trenches in the Southwest Landfill (Site D-1).




Locations of All Identified Fire Training Areas, Reese AFB, Texas.




Fuel and Other POI Storage Areas, Reese AFB, Texas.

ATTACHMENT B

# ECOLOGY AND ENVIRONMENT, INC., STANDARD OPERATING PROCEDURES FOR EMERGENCIES DUE TO HEAT AND HEAT STRESS MONITORING

Field operations during the summer months can create a variety of hazards to the employee. Heat cramps, heat exhaustion, and heat stroke can be experienced and, if not remedied, can threaten life or health. Therefore, it is important that all employees be able to recognize symptoms of these conditions and be capable of arresting the problem as quickly as possible.

## THE EFFECTS OF HEAT

As the result of normal oxidation processes within the body, a predictable amount of heat is generated. If the heat is liberated as it is formed, there is no change in body temperature. If the heat is liberated more rapidly, the body cools to a point at which the production of heat is accelerated and the excess is available to bring the body temperature back to normal.

Interference with the elimination of heat leads to its accumulation and thus to the elevation of body temperature. As a result, the person is said to have a fever. When such a condition exists, it produces a vicious cycle in which certain body processes speed up and generate additional heat. Then the body must eliminate not only the normal but also the additional quantities of heat.

Heat produced within the body is brought to the surface largely by the bloodstream and escapes to the cooler surroundings by conduction and radiation. If air movement or a breeze strikes the body, additional heat is lost by convection. However, when the temperature of the surrounding air becomes equal to or rises above that of the body, all of the heat must be lost by vaporization of the moisture or sweat from the skin surface. As the air becomes more humid (contains more moisture), vaporization from the skin slows down. Thus, on a day when the temperature is 95 to 100°F, with high humidity and little or no breeze, conditions are ideal for the retention of heat within the body. It is on such a day or, more commonly, a succession of such days (a heat wave) that medical emergencies due to heat are likely to occur. Such emergencies are classified in three categories: heat cramps, heat exhaustion, and heat stroke.

## HEAT CRAMPS

Heat cramps usually affect people who work in hot environments and perspire a great deal. Loss of salt from the body causes very painful cramps of the leg and abdominal muscles. Heat cramps also may result from drinking iced water or other drinks either too quickly or in too large a quantity.

Heat Cramp Symptoms. The symptoms of heat cramp are:

- Muscle cramps in legs and abdomen,
- Pain accompanying the cramps,
- Faintness, and
- Profuse perspiration.

**Heat Cramp Emergency Care.** Remove the patient to a cool place. Give him sips of liquids such as "Gatorade" or its equivalent. Apply manual pressure to the cramped muscle. Remove the patient to a hospital if there is any indication of a more serious problem.

## HEAT EXHAUSTION

Heat exhaustion occurs in individuals working in hot environments, and may be associated with heat cramps. Heat exhaustion is caused by the pooling of blood in the vessels of the skin. The heat is transported from the interior of the body to the surface by the blood. The blood vessels in the skin become dilated and a large amount of blood is pooled in the skin. This condition, plus the blood pooled in the lower extremities when an individual is in an upright position, may lead to an inadequate return of blood to the heart and eventually to physical collapse.

**Heat Exhaustion Symptoms.** The symptoms of heat exhaustion are:

- Weak pulse;
- Rapid and usually shallow breathing;
- Generalized weakness;
- Pale, clammy skin;
- Profuse perspiration;
- Dizziness;
- Unconsciousness; and
- Appearance of having fainted (the patient responds to the same treatment administered in cases of fainting).

**Heat Exhaustion Emergency Care.** Remove the patient to a cool place and remove as much clothing as possible. Administer cool water, "Gatorade," or its equivalent. If possible, fan the patient continually to remove heat by convection, but do not allow chilling or overcooling. Treat the patient for shock, and remove him to a medical facility if there is any indication of a more serious problem.

## HEAT STROKE

Heat stroke is a profound disturbance of the heat-regulating mechanism, associated with high fever and collapse. Sometimes this condition results in convulsions, unconsciousness, and even death. Direct

exposure to sun, poor air circulation, poor physical condition, and advanced age (over 40) bear directly on the tendency to heat stroke. It is a serious threat to life and carries a 20% mortality rate. Alcoholics are extremely susceptible.

Heat Stroke Symptoms. The symptoms of heat stroke are:

- Sudden onset;
- Dry, hot, and flushed skin;
- Dilated pupils;
- Early loss of consciousness;
- Full and fast pulse;
- Breathing deep at first, later shallow and even almost absent;
- Muscle twitching, growing into convulsions; and
- Body temperature reaching 105 to 106°F or higher.

Heat Stroke Emergency Care. Remember that this is a true emergency. Transportation to a medical facility should not be delayed. Remove the patient to a cool environment if possible, and remove as much clothing as possible. Assure an open airway. Reduce body temperature promptly--preferably by wrapping in a wet sheet or else by dousing the body with water. If cold packs are available, place them under the arms, around the neck, at the ankles, or at any place where blood vessels that lie close to the skin can be cooled. Protect the patient from injury during convulsions, especially from tongue biting.

## AVOIDANCE OF HEAT-RELATED EMERGENCIES

Please note that, in the case of heat cramps or heat exhaustion, "Gatorade" or its equivalent is suggested as part of the treatment regime. The reason for this type of liquid refreshment is that such beverages will return much-needed electrolytes to the system. Without these electrolytes, body systems cannot function properly, thereby increasing the represented health hazard. Therefore, when personnel are working in situations where the ambient temperatures and humidity are high--and especially in situations where protection Levels A, B, and C are required--the site safety officer must:

- Assure that all employees drink plenty of fluids ("Gatorade" or its equivalent);
- Assure that frequent breaks are scheduled so overheating does not occur; and
- Revise work schedules, when necessary, to take advantage of the cooler parts of the day (i.e., 5:00 a.m. to 1:00 p.m., and 6:00 p.m. to nightfall).

If protective clothing must be worn, especially Levels A and B, the suggested guidelines for ambient temperature and maximum wearing time per excursion are:

| Ambient Temperature (°F) | Maximum Wearing Time per Excursion (Minutes) |
|---|---|
| Above 90 | 15 |
| 85 to 90 | 30 |
| 80 to 85 | 60 |
| 70 to 80 | 90 |
| 60 to 70 | 120 |
| 50 to 60 | 180 |

One method of measuring the effectiveness of employees' rest-recovery regime is by monitoring the heart rate. The "Brouha guideline" is one such method:

- During a three-minute period, count the pulse rate for the last 30 seconds of the first minute, the last 30 seconds of the second minute, and the last 30 seconds of the third minute.
- Double the count.

If the recovery pulse rate during the last 30 seconds of the first minute is at 110 beats/minute or less and the deceleration between the first, second, and third minutes is at least 10 beats/minute, the work-recovery regime is acceptable. If the employee's rate is above that specified, a longer rest period is required, accompanied by an increased intake of fluids.

# ATTACHMENT C

LEVEL C DECONTAMINATION

## A. EQUIPMENT WORN

The full decontamination procedure outlined is for workers wearing Level C protection (with taped joints between gloves, boots, and suit) consisting of:

- One-piece, hooded, chemical-resistant splash suit.
- Canister equipped, full-face mask.
- Hard hat.
- Chemical-resistant, steel toe and shank boots.
- Boot covers.
- Inner and outer gloves.

## B. PROCEDURE FOR FULL DECONTAMINATION

Station 1: Segregated Equipment Drop

Deposit equipment used on-site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each will be contaminated to a different degree. Segregation at the drop reduces the probability of cross-contamination.

Equipment: various size containers
plastic liners
plastic drop cloths

Station 2: Boot Cover and Glove Wash

Scrub outer boot covers and gloves with decon solution or detergent/ water.

Equipment: container (20-30 gallons)
decon solution
or
detergent water
2-3 long-handle, soft-bristle scrub brushes

Station 3: Boot Cover and Glove Rinse

Rinse off decon solution from Station 2 using copious amounts of water. Repeat as many times as necessary.

Equipment: container (30-50 gallons)
or
high-pressure spray unit
water
2-3 long-handle, soft-bristle scrub brushes

Station 4: Tape Removal

Remove tape around boots and gloves and deposit in container with plastic liner.

Equipment: container (20-30 gallons)
plastic liners

Station 5: Boot Cover Removal

Remove boot covers and deposit in container with plastic liner.

Equipment: container (30-50 gallons)
plastic liners
bench or stool

Station 6: Outer Glove Removal

Remove outer gloves and deposit in container with plastic liner.

Equipment: container (20-30 gallons)
plastic liners

Station 7: Suit/Safety Boot Wash

Thoroughly wash splash suit and safety boots. Scrub with long-handle, soft-bristle scrub brush and copious amounts of decon solution or detergent/water. Repeat as many times as necessary.

Equipment: container (30-50 gallons)
decon solution
or
detergent/water
2-3 long-handle, soft-bristle scrub brushes

Station 8: Suit/Safety Boot Rinse

Rinse off decon solution or detergent/water using copious amounts of water. Repeat as many times as necessary.

Equipment: container (30-50 gallons)
or
high-pressure spray unit
water
2-3 long-handle, soft-bristle scrub brushes

Station 9: Canister or Mask Change

If worker leaves Exclusion Zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boots covers donned, and joints taped. Worker returns to duty.

Equipment: canister (or mask)
tape
boot covers
gloves

Station 10: Safety Boot Removal

Remove safety boots and deposit in container with plastic liner.

Equipment: container (30-50 gallons)
plastic liners
bench or stool
boot jack

Station 11: Splash Suit Removal

With assistance of helper, remove splash suit. Deposit in container with plastic liner.

Equipment: container (30-50 gallons)
bench or stool
plastic liner

Station 12: Inner Glove Wash

Wash inner gloves with decon solution or detergent/water that will not harm skin. Repeat as many times as necessary.

Equipment: decon solution
or
detergent/water
basin or bucket

Station 13: Inner Glove Rinse

Rinse inner gloves with water. Repeat as many times as necessary.

Equipment: water
basin or bucket
small table

Station 14: Facepiece Removal

Remove facepiece. Avoid touching face with gloves. Deposit facepiece in container with plastic liner.

Equipment: container (30-50 gallons)
plastic liners

Station 15: Inner Glove Removal

Remove inner gloves and deposit in container with plastic liner.

Equipment: container (20-30 gallons)
plastic liners

Station 16: Inner Clothing Removal

Remove clothing soaked with perspiration. Place in container with plastic liner. Do not wear inner clothing off-site since there is a possibility small amounts of contaminants might have been transferred in removing fully encapsulating suit.

Equipment: container (30-50 gallons)
plastic liners

Station 17: Field Wash

Shower if highly toxic, skin-corrosive or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available.

Equipment: water
soap
tables
wash basins/buckets
field showers

Station 18: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather.

Equipment: tables
chairs
lockers
clothes

C. FULL DECONTAMINATION (SIT. 1) AND THREE MODIFICATIONS

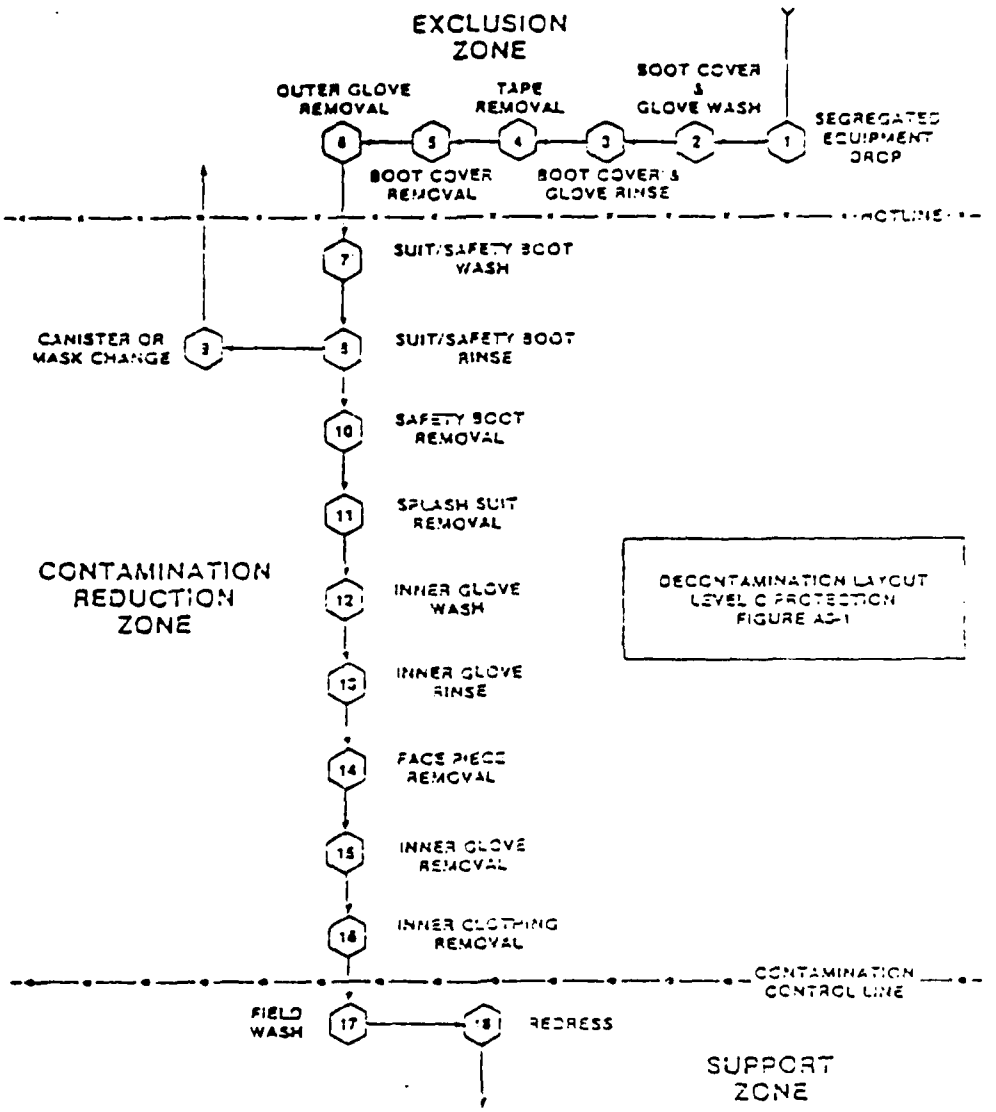
| SIT | STATION NUMBER | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X |
| 2 | X | X | X | X | X | X | X | X | X | | | | | | | | | |
| 3 | X | | | | | | X | X | | X | X | | | X | X | X | X | |
| 4 | X | | | | | | X | X | X | | | | | | | | | |

Situation 1: The individual entering the Contamination Reduction Corridor is observed to be grossly contaminated or extremely skin-corrosive substances are known or suspected to be present.

Situation 2: Same as Situation 1 except individual needs new canister or mask and will return to Exclusion Zone.

Situation 3: Individual entering the CRC is expected to be minimally contaminated. Extremely skin-corrosive materials are not present. No outer gloves or boot covers are worn. Inner gloves are not contaminated.

Situation 4: Same as Situation 3 except individual needs new canister or mask and will return to Exclusion Zone.


EXCLUSION ZONE
OUTER GLOVE REMOVAL
TAPE REMOVAL
BOOT COVER & GLOVE WASH
SEGREGATED EQUIPMENT DROP
6
5
4
3
2
1
BOOT COVER REMOVAL
BOOT COVER & GLOVE RINSE
HOTLINE
7
SUIT/SAFETY BOOT WASH
CANISTER OR MASK CHANGE
3
8
SUIT/SAFETY BOOT RINSE
10
SAFETY BOOT REMOVAL
11
SPLASH SUIT REMOVAL
CONTAMINATION REDUCTION ZONE
12
INNER GLOVE WASH
13
INNER GLOVE RINSE
14
FACE PIECE REMOVAL
15
INNER GLOVE REMOVAL
16
INNER CLOTHING REMOVAL
CONTAMINATION CONTROL LINE
FIELD WASH
17
18
REDRESS
SUPPORT ZONE
DECONTAMINATION LAYOUT LEVEL C PROTECTION FIGURE AD-1

ATTACHMENT D

Project Site Safety Forms

Complete prior to on-site work

HAZARDOUS & TOXIC MATERIALS TEAM
SITE SAFETY REVIEW

GENERAL INFORMATION

DATE_____ TIME_____ JOB NO: DF-2000

SITE: Reese Air Force Base

LOCATION: Lubbock, Texas

ONSITE CLIENT CONTACT: _____

OBJECTIVES: Subsurface soil and water sampling, geophysical surveys

TYPES OF CHEMICALS ANTICIPATED: Solvents, metals, fuels, oils, pesticides

MEETING CONDUCTED BY: _____

TOPICS DISCUSSED

PHYSICAL HAZARDS: Heat, drilling accidents

CHEMICAL HAZARDS: Fuels, solvents, heavy metals, oils, pesticides

PERSONAL PROTECTION: C/D

DECONTAMINATION: Soap and water wash/methanol, DI rinse

SPECIAL SITE CONSIDERATIONS: Large site size, complex logistics for field work

CHECK LIST

1. Emergency information reviewed? and made familiar to all team members?
2. Route to nearest hospital driven a and its location known to all team
3. Site safety plan readily available and its location known to all team members? ___

Complete prior to on-site work

## ON-SITE SAFETY MEETING

Project _____

Date _____ Time _____ Job No. DF-2000

Address Reese Air Force Base

Specific Location _____

Type of Work Subsurface soil and water sampling
Geophysical surveys

### SAFETY TOPICS PRESENTED

Protective Clothing/Equipment Levels C/D

Chemical Hazards Fuels, solvents, heavy metals, oils, pesticides

Physical Hazards Heat stress, drilling hazards

Emergency Procedures Notify base medical facility for emergency treatment and transport to Lubbock General Hospital
First aid/CPR/Water/Shade/Oxygen

Hospital/Clinic Lubbock General Phone (806) 743-9911

Hospital Address 602 Indiana

Special Equipment _____

Other _____

### ATTENDEES

| Name Printed | Signature |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Meeting Conducted By: _____ _____
Name Printed Signature

Site Safety Officer _____ Team Leader _____

7/84 Revised DLD

## STATEMENT OF MEDICAL FITNESS

Must be completed prior to work starting

This is to confirm that the following employees may be engaged in field activities at _____ (name of site) in connection with the Subcontract Agreement between E & E and _____, dated _____, 19__, and that all of said employees are medically fit both to perform required field activities and to utilize respiratory equipment in accordance with 29 CFR, Part 1910 and "USEPA Standard Operating Safety Guides," 1984.

_____

_____

_____

_____

_____

_____

Authorized Subcontractor Representative

DATE/TIME: _____

NAME: _____ SITE: _____

COMPANY: _____ LOCATION: _____

Pulse Rate Monitoring (30 second rest prior to first measurement):

Starting Time: _____ Pulse Rate: _____ beats/minute;

rest 30 sec.; _____; rest 30; _____ b/m;

rest 30 sec.; _____; rest 60; _____ b/m;

rest 60 sec.; _____; rest 60; _____ b/m.

Starting Time: _____ Pulse Rate: _____ beats/minute;

rest 30 sec.; _____; rest 30; _____ b/m;

rest 30 sec.; _____; rest 60; _____ b/m;

rest 60 sec.; _____; rest 60; _____ b/m.

Starting Time: _____ Pulse Rate: _____ beats/minute;

rest 30 sec.; _____; rest 30; _____ b/m;

rest 30 sec.; _____; rest 60; _____ b/m;

rest 60 sec.; _____; rest 60; _____ b/m.

Starting Time: _____ Pulse Rate: _____ beats/minute;

rest 30 sec.; _____; rest 30; _____ b/m;

rest 30 sec.; _____; rest 60; _____ b/m;

rest 60 sec.; _____; rest 60; _____ b/m.

Method of Measurement:

Carotid Artery: _____ ; Instrument (specify type): _____.

Self-Determined & Reported: _____

Site Safety Officer: _____(Contractor); _____(Contract Monitor)

_____

LRF/E&E/042584

Site Safety Officer
Contract Monitor

END

DATE

FILMED

DTIC

9-88