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GROUNDWATER MONITORING PLAN

NAVAL WEAPONS SUPPORT CENTER

CRANE, INDIANA

SEPTEMBER 1981

INTRODUCTION

The Naval Weapons Support Center, Crane, Indiana has adopted the Groundwater Monitoring Plan prepared by the Army Environmental Hygiene Agency (AEHA), since the Navy has a contract with this organization to perform all groundwater analyses for the Center. This plan will be used for all required sampling and analyses and is found within. Quarterly analysis of the wells on Center has been scheduled for November 1981, March, June and September of 1982. Annual and semi-annual monitoring will be performed after the first year. The monitoring will be performed in accordance with requirements outlined in 40 CFR 265.90 - 265.94 hazardous waste regulations on groundwater quality.

US ARMY GROUND-WATER MONITORING AND ASSESSMENT PROGRAM

INSTRUCTIONS

FOR

COLLECTION,

PREPARATION AND SHIPMENT

OF SAMPLES

US ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MD
SEPTEMBER 1981

Instr for Collection, Prep and Shpmt of Samples

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Instr for Collection, Prep and Shpmt of Samples

I. PURPOSE. This document is written to provide guidance to personnel at US Army installations who will be sampling ground-water monitoring wells. It has been prepared primarily to assist those installations which are being provided support by the US Army Environmental Hygiene Agency (USAEHA) in meeting monitoring requirements at sanitary landfills and hazardous waste landfills and surface impoundments.

II. GENERAL. Sections III through VI and Section VIII of this document provide instructions on collection and preparation of samples and data reporting. Section VII provides information on chemical analysis methods. The contents of this document may be used by installations monitoring hazardous waste landfills and surface impoundments to prepare the Sampling and Analysis Plan required by regulation (40 CFR 265.92).

Questions concerning these instructions or sampling and sample preparation should be referred to Mr. Gary Nemeth, Geotechnical Engineering Services Branch, Waste Disposal Engineering Division, this Agency, AV 584-2024 or (301) 671-2024.

III. SAMPLE CONTAINERS. The USAEHA will provide all sample containers to be used for shipment of samples. The only sample containers to be provided by the installation are the 1-gallon plastic jugs to be used to hold the samples prior to filtering. The number of sample containers needed for each well sample will depend on the number of parameters and filtering and preservation requirements. Inclosure 1 identifies the parameters and the eight separate containers which will be used when samples are taken from hazardous waste site monitoring wells. Inclosure 2 lists containers which will normally be provided for parameter groups which may be required at sanitary landfills or at hazardous waste sites with special parameter requirements. Only containers provided by USAEHA should be used. These containers will be properly cleaned and prelabeled with installation name, site identification, parameters and preservation information. The containers will normally be shipped by USAEHA with all those required for sampling one well in one box. The boxes should be kept by the installation because some will be used as shipping boxes for samples. Under some circumstances containers of a different size than those shown in Inclosures 1 and 2 will be used. These substitutions will be made because volume requirements will depend upon the number of parameters to be measured.

IV. SAMPLING AND FIELD OBSERVATIONS.

A. Water Level Measurement. Prior to sampling a well the water level must be measured and recorded on the field data log sheet. When the field crew visits the well they should have information available concerning well depth, depth to top of screen, and screen length. Water levels are most commonly measured with a clean steel tape. The tape should be lowered into the well until the end is a couple feet below the water surface. The wetted

length is measured when the tape is removed; and this measurement is subtracted from the length lowered into the well. This depth to water from the top of casing should be recorded. The length of casing above the ground surface should then be subtracted to obtain the desired value of depth to water from ground surface. The same value for length of casing above ground should be used each time water level is measured in the well, unless the casing length is modified. The depth measurements should be to the nearest tenth of a foot. If the portion of the tape which has been wetted is difficult to determine, chalk may be placed on the tape to make reading easier. Inks should not be used on the tape. If the tape must be weighted, a material such as stainless steel should be used. An electric water level probe may be used instead of a steel tape. Its advantages are convenience and not having to know prior to measurement the approximate depth to water. If the well is found to be dry, this should be noted on the log sheet. If the depth to water is found to be below the bottom of the screened interval, the well should also be considered dry and not sampled. This situation may occur in wells where the bottom portion of the well is not screened and holds water after water table levels drop below the screened interval. The steel tape, or electric probe, should be rinsed thoroughly with fresh tap water or distilled water prior to use in another well. A tape or probe which has been in contact with soil at the well site should not be lowered into a well until it has been rinsed clean. If contamination by oil or grease is evident, soapy water or acetone should be used for cleaning, followed by tap water rinsing.

B. Well Purging. All monitoring wells must be pumped or bailed prior to sampling to insure that samples are representative of the ground water and do not contain water which has been standing in the casing. For this monitoring program at least five volumes of water in the well casing should be removed. However, for a low yield well which does not quickly recharge as it is pumped, the well should be pumped or bailed dry and the sample then obtained as soon as the well recharges. When calculating the amount of water which must be purged, subtract depth to water (from ground surface) from the total depth of the well and then multiply by 0.16 for a 2-inch well, 0.37 for a 3-inch well, or 0.65 for a 4-inch well to obtain the volume of standing water in the well. The amount pumped prior to sampling should be recorded on the field data log sheet (Inclosures 3 and 4). The depth at which the pump should be set when purging a well will depend upon well construction details, water depth in the well, and well recharge rate. For a well which does not recharge as it is pumped, the pump intake should be as deep as possible in the well, but not so deep as to pick up the sediment which has accumulated in the well bottom. In wells which recharge as they are pumped, the pump intake should be about 5 feet below the surface of the water in the well. The pump will have to be lowered if the water level in the well drops during pumping. Pumping in this manner will insure that the water which has been standing in the well will be efficiently removed and a representative sample taken. The only exception to these pumping depth instructions will be those few

situations where the monitoring wells have more than one screened interval or a sediment trap.[1] When a well contains a sediment trap the final portion of purged water should be pumped from within the sediment trap section (do not lower pump into sediment in the bottom of the trap). When a well is constructed with more than one screen, the purged water should be pumped from the unscreened sections, beginning with the uppermost. Manufacturer's literature should be consulted to obtain specific instructions concerning the operation of sampling pumps. Questions may also be referred to the Geotechnical Engineering Services Branch, Waste Disposal Engineering Division, US Army Environmental Hygiene Agency, AUTOVON 584-2024. When pumping or sampling a well great care must be exercised to insure that contaminants are not introduced into the well or a sample. A sampler or sample tubing, or a bailer or bailer cable must not be allowed to contact the ground or a dirty surface in a vehicle or sampling equipment box. Plastic sheeting may be used to rest hoses, lines, and samplers upon. New sheeting should be used for each well sampled. Sampling equipment must be thoroughly cleaned before it is placed in its storage case. In those situations when there is windblown dust at the sampling site, it will be impossible to obtain a good sample. Sampling should be postponed until a more favorable time.

C. Sampling.

1. The sample containers in which unfiltered water is to be shipped should be filled first (see Inclosures 1 and 2). These containers should be rinsed several times with a small amount of water pumped from the well prior to filling (except for samples for grease and oil analysis). All of these containers (except grease and oil) must be filled to overflowing so that no headspace remains. Samples should be protected from light and kept cool from the time they are collected. Sample container labels should be completed using a waterproof pen before they are filled when the container is dry. The portion of the sample which must be filtered should be collected in polyethylene gallon bottles. For hazardous waste site wells monitored during 1981 and 1982 two of these gallon containers should be filled. The number required at sanitary landfill wells depends upon the parameters (see Inclosure 2). These containers should also be rinsed and filled to overflowing. Containers should be labeled with a waterproof pen. Sample containers should be filled in a manner which does not agitate or aerate the sample. This is important to prevent loss of volatile contaminants, and to prevent chemistry changes due to either CO_2 loss with pH increase or oxygenation of the sample. Containers are filled to overflowing for the same reasons. Some wells which do not recharge while they are pumped may not

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[1] A sediment trap is an unscreened section at the bottom of the well.

produce enough sample at one time. This situation will occur most frequently for hazardous waste site wells because more sample is required than at most sanitary landfills. The needed water should be obtained as soon as the well recharges.

2. Samples should be taken to the place where they will be filtered and preserved as soon as possible after sampling; and definitely within an hour or two.

3. Sampling equipment must be thoroughly cleaned between sampling at each well. This may normally be accomplished by rinsing thoroughly with tap water. At least 2-3 gallons of water should be pumped through the tubing and pump with each rinsing. If a bailer is used, it should be rinsed three times with tap water and then rinsed three times with distilled water. In those cases where a sampler becomes contaminated by pumping oily or greasy water, it should be rinsed first with soapy water and then rinsed thoroughly with clean water. It may be necessary to disassemble a pump to effectively clean it of oil and grease. Acetone rinsing is an effective method of removing oil and grease contamination, but should not be used unless it is certain that the materials used to construct the pump or bailer will not be affected. The USAEHA will advise an installation when special solvent cleaning of sampling equipment is considered necessary.

4. Deviations from the procedures specified above should be noted on the field data log sheet. Observations concerning the condition of the well, odor and color of the water should also be noted. Note if the well was found uncapped and also note the condition of the grout seal around the well.

D. Sampling Schedule and Sequence. Because of shipping and laboratory restrictions, all sampling and shipment of samples must be accomplished on either a Monday or Tuesday of the week. Those installations with many sites to be monitored may have to conduct sampling over a period of several weeks. However, all wells at each site to be monitored must be sampled the same day. When sampling wells at a site, the upgradient (and presumably uncontaminated) well or wells should be sampled first followed by the downgradient wells (or wells potentially contaminated).

V. SAMPLE PREPARATION.

A. Work Area Requirements. The work area, preferably a laboratory, must be cleaned and must be an area where there has not been any large-scale chemical usage. Pesticide mix areas or areas used to handle explosives are not acceptable. Specific requirements for the work area include:

1. 110-volt electricity,

2. minimum of 10 linear feet of working bench space,

3. complete sample filtration system,

4. pH meter with accessories (if pH measurement required),

5. distilled water,

6. cleaning supplies including nitric acid and acetone,

7. chemical preservative ampules (provided by USAEHA), and

8. Sample kits containing appropriate containers (provided by USAEHA).

B. Sample Storage. Samples should be placed in a cool, dark place (preferably a refrigerator) until ready for shipment. Those containers filled in the field should be placed into such storage as soon as they are brought to the work area. The polyethylene gallon containers should also be kept in cool and dark storage when not being used. When containers are received from sample collectors they should be checked for proper labeling.

C. pH Measurement. The sample pH should be measured as soon as possible after the sample is taken. When a sample is exposed to the air the pH level may change. This change is primarily due to loss of dissolved CO_2 from the sample. A pH measurement taken at the work area soon after the sample is taken will normally be more accurate than a field measurement as long as a significant pH change has not occurred. Visible evidence of precipitate forming in the sample between the time of sample collection and the time of pH measurement at the work area would indicate that the pH has changed and that an accurate measurement would have to be taken in the field as soon as the sample is taken. To be sure that accurate measurements are being obtained, it is recommended that pH measurements also be taken in the field with a portable meter during the initial sampling periods. For those sites where pH is not a required parameter (some sanitary landfills), it is recommended that pH be measured if an installation has a meter. For hazardous waste sites, pH measurement of four portions of the same sample are required. Sanitary landfill samples will only require one measurement. The following instructions should be followed when measuring pH.

1. Initially calibrate the pH meter in accordance with the manufacturers' specifications. The internal filling solution should cover the internal reference element in the combination electrode.

2. Standardize the meter with two buffer solutions, either pH 4.00 and 7.00, or 7.00 and 9.00. If samples are expected to be acidic, the lower range should be used. The buffer solutions should be placed into 150-mL beakers for measurement, and enough should be used so that the electrode is submerged at least 1 inch. The buffer and sample temperatures should be nearly the same when measurements are made. Ground water temperatures are

normally about 10°C. Therefore, the buffer solutions should be cooled to approximately this temperature before use. If pH measurements of the buffer solutions do not agree with the known values, either some instrument adjustment is necessary, or the buffer solution is contaminated and should be replaced. In this situation, follow the instructions in the instrument manual. When making measurements on samples or buffer solutions, the liquid in the beaker should be stirred slightly using a magnetic stirrer and stirring bar.

3. Pour a portion of the unfiltered sample from the gallon polyethylene jug into a clean 150-mL beaker. Measure and record the temperature on the field data logsheet. Adjust the temperature compensation setting on the meter to the temperature of the sample in accordance with the instrument manual. Measure and record the pH. The measurement should be to the nearest 0.1 pH unit. For hazardous waste sites, portions of the sample should be placed into four beakers and measurements recorded for each. If any of the four replicate measurements differ from the others by more than 0.3 pH units, perform the measurements again using new sample portions in different beakers. If pH measurements are made in the field, stirring with a magnetic stirrer and cooling the buffer solutions will not be practical and the meter may not be adjustable for temperature. Simply standardize the meter using the buffer solutions, measure and record sample temperature and pH.

4. Rinse the electrode with distilled water from a squeeze bottle every time the electrode is removed from the solution and blot dry before dipping into the next solution. After an oily sample is measured, rinse the electrode with acetone from a squeeze bottle and then rinse with distilled water.

5. Known and unknown control samples will be periodically sent by USAEHA to the installation for pH measurement. Measure a known control sample after every 20 sample measurements, or more often, and note results on the reverse side of the field data logsheet upon which the previous sample pH measurement was recorded. If the measured value is not within 10 percent of the known value, an instrument buffer or contamination problem is likely. This problem must be resolved before any further pH measurements are taken. Also repeat all sample measurements back to the last control sample or since the last standardization measurement. Unknown control samples should be measured when they are received and results reported to USAEHA.

6. Cleaning of beakers prior to use should be performed in accordance with instructions in Section V.F.

D. Filtering. Filtering may be performed by any one of three procedures. The first one being described is the most common type utilizing a standard vacuum pump and an all glass system. It consists of the pump, 1-liter filtering flask, ground glass base, 300-mL funnel, spring clamp,

forcep, prefilters, and membrane filters. The order for assembling the filtering system is as indicated below:

1. The tubulated ground glass base is fitted over the 1-liter flask.

2. A membrane filter is carefully placed over the fritted glass area of the base and then overlaid by a prefilter. The prefilter and membrane filter shall be handled with forceps.

3. The funnel is placed on top of the prefilter and fastened to the base by the spring clamp.

4. Vacuum tubing is connected from the vacuum pump to the side arm nipple of the base.

5. The pump is turned on and sample is gently poured into the funnel. The filtration rate is dependent on the nature of the sample. It may be necessary to replace the filters if they are fairly well clogged or if the filtration rate is extremely slow. If this is done, great care must be exercised so as not to contaminate the sample and not allow any suspended matter to enter the already filtered portion.

The second filtration procedure which may be used is performed with the "Millipore Hazardous Waste Filtration System." It uses compressed nitrogen instead of a vacuum pump. Large volumes can be filtered in a relatively short time period with this system. If this system is purchased, a detailed manual will be provided by the company. If, however, problems arise with the system, USAEHA will assist in resolving them. This system also uses the membrane filters and prefilters, only they are much larger than those with the vacuum system because of the larger filtration surface area. The third filtration procedure is also based on compressing a liquid sample through a membrane filter using nitrogen gas. Also with this procedure large volumes can be filtered in a relatively short time period. The procedure is known as the Barrel Pressure Filtering Apparatus and is manufactured by Leonard Mold and Die Works. The instructions are fairly simple and are inclosed with the purchased equipment. The USAEHA will assist if any problems develop with the equipment. The membrane filters must be soaked in distilled water for 24 hours prior to using. They should also be handled only with the purchased forceps, never with one's fingers. Care must be exercised when handling the membrane filter to avoid making any tears or pin holes. Before a sample bottle is filled with a filtered sample, it should be rinsed once with a small amount of the filtered sample and then that portion discarded. Sample bottles should not be rinsed or cleaned in any other manner because they will have been appropriately cleaned by USAEHA prior to shipment. Smaller containers should be filled before the large 1-gallon cubitaner for radiochemistry parameters. All containers should be filled to nearly full, but not overflowing because perservative must be added to some. The samples

for each site being monitored should be filtered beginning with the upgradient well(s) to minimize the possibility of cross contamination problems. The filtering apparatus should be cleaned between samples as instructed in Section V.F.

E. Sample Preservation.

1. The sample should be preserved with the chemicals listed in Inclosures 1 and 2. The acid ampules and sodium hydroxide tablets will be provided by USAEHA as required.

2. Care must be exercised when breaking and emptying the ampules so as to minimize contamination and alleviate chemical spillage on the sampler's hands and clothes. Disposable gloves shall be worn to help protect the hands. It is imperative that no mixup among the chemical ampules occurs and that they are separated from each other when being opened. The broken ampules must be properly discarded. Ampules will be color coded for identification.

3. Sample preservation requirements will also be stated on the container labels to minimize error. The chemical preservative, filtering and cooling requirements will be identified on the appropriate container labels. All containers, including those to which preservative has not been added, should be checked to insure that they have been dated and initialed. The dates placed on the containers and field data log sheets must be Julian dates consisting of five digits. These can be taken from many calenders. The Julian date consists of two digits to identify the year and three digits to identify the day of the year. Example: 81292 is the Julian date for 19 Oct 81.

4. The time from sampling until filtering and preservation is complete must be kept as short as possible. If the sampling rate is faster than samples can be filtered and preserved, sampling should be paced so that samples do not set more than an hour awaiting preparation.

5. If many wells are to be sampled, it will probably be best to have two persons taking samples and two persons preparing samples simultaneously. If only a few wells are to be sampled, two persons could take the samples and then return to the work area and prepare them.

F. Glassware and Equipment Cleaning.

1. Proper cleaning of glassware and equipment is essential to obtaining accurate ground-water quality analytical results. Beakers and the filtration system must be rinsed thoroughly with tap water and then rinsed three times with distilled water between each sample. If any glassware or equipment becomes coated with an oily residue it should be rinsed with acetone using a

500-mL squeeze bottle and then washed thoroughly with hot detergent water prior to the tap water and distilled water rinsings. It is imperative that no acetone or detergent remain on the apparatus after the water rinsings.

2. In addition to the above rinsings, all parts of the filtration system (except prefilters and membrane filters) shall be rinsed with a 50 percent nitric acid solution between samples from different facilities. If only one facility is being monitored, the acid rinse should precede the first sample. After the 50 percent nitric acid rinsing, the apparatus must be thoroughly rinsed with tap water and then rinsed three times with distilled water. All traces of the nitric acid must be removed. The 50 percent nitric acid solution (nitric acid mixed with distilled water on a one to one basis) should be made up in the rigid, leakproof, 1-gallon size, polyproplene jug purchased by the installation. The disposable rubber gloves should be worn when making up this solution. First fill the jug half-way with distilled water. To it, carefully add concentrated nitric acid to near the top. Cap and mix gently. The solution will become hot, but the jug will withstand the thermal shock. This solution should be labeled and protected from all sampling bottles. Rubber gloves should also be worn when rinsing the filtering system.

3. More frequent 50 percent nitric acid solution rinsings are not desired because they are time consuming and because of the risk of acid residue affecting nitrate analysis results. In some situations USAEHA may direct that the acid rinsing be performed between all samples (such as for sites with heavy metal ground-water contamination).

4. These instructions do not include procedures to be used to protect against cross contamination with organic compounds because these sample portions are not going to be filtered (pesticides, herbicides, total organic halogen). In those special cases where samples for organics analysis will be filtered, special cleaning instructions will be provided by USAEHA. This cleaning will normally involve cleaning with acetone or other organic solvents.

VI. SAMPLE SHIPMENT.

A. Packaging. All glass sample containers must be enclosed in their styrofoam packing and this packing wrapped with tape. Insulated coolers must be used as shipping containers for those sample portions which must be kept cool (see Inclosures 1 and 2). To maintain a low temperature during shipping, several reuseable ice packs should be placed in the cooler with the samples. Those sample portions which do not require cooling (metals and radiochemistry parameters) may be shipped to the lab in the cardboard shipping containers used to ship the containers to the installation. Those installations with only a few wells and no radiochemistry analysis requirements may find it as convenient and no more costly to ship all sample containers in the coolers.

B. Shipping Times.

1. Those sample portions which must be kept cool shall normally be shipped such that they are delivered to the laboratory within 2 days of shipment. The exception is those few sample portions which have parameters with very short holding times. These must be shipped so that they are delivered to the laboratory within 24 hours and are identified in Inclosure 2. The routine hazardous waste site monitoring does not require 24 hour shipping. However, such shipping may be required if analysis for special parameters is required or if 2 day shipping is found to be unsatisfactory for some parameter. The cardboard shipping containers with metals and radiochemistry analysis samples may be shipped in any manner which will insure delivery within 7 days. If any samples arrive at the laboratory late and holding times can not be met, the samples will be discarded and the installation instructed to resample. If these instructions are followed, holding times specified in 40 CFR Part 136, 18 December 1979 Federal Register, pages 75028-75052, will be complied with.

2. All samples taken during any one day and which require cooling must be prepared, packaged, and shipped the same day. The metals and radiochemistry samples may be shipped the following day if it is more convenient. Because of laboratory scheduling restrictions, all samples shipped in coolers must arrive not later than Thursday. This means that coolers must be shipped on Monday or Tuesday, or Wednesday if 24-hour shipping is used. If samples arrive at the laboratory on a Friday or Saturday, and analysis can not be performed soon enough to meet holding times, the samples will be discarded and resampling will be necessary.

3. The cost for shipping of samples to the laboratory and for return shipment of empty coolers with the reuseable ice packs must be paid by the installation. Paperwork for return shipment must be inclosed in the coolers when they are shipped to the laboratory. Because there are no time restrictions, the return of coolers by expensive "special" shipment is not necessary.

4. During the first year of this monitoring program, most analyses will be performed by Century Environmental Testing Laboratories, Thorofare, NJ (near Camden). Shipping to that laboratory should be considered when preparing shipping cost estimates.

C. Chain of Custody Control. Regulations require that sample chain of custody records be maintained. Inclosure 5 is the record form which will be used and Inclosure 6 is a sample of a completed form. Four copies (including original) of the form must be completed for each shipping container. Either carbon paper or a copier machine may be used. One copy should be held while the original and two copies are enclosed in the shipping container with the samples. The forms should be placed in a plastic protector to keep them from

getting wet. When the laboratory custodian receives the samples, that individual will sign all copies of the form. The original will be returned to the installation where it must be held on file. A second copy will be sent to Commander, US Army Environmental Hygiene Agency, ATTN: HSE-ES-S/Gary Nemeth, Aberdeen Proving Ground, MD 21010. The remaining copy will be held by the laboratory custodian.

VII. CHEMICAL ANALYSIS.

A. Analytical Procedures. The analytical procedures to be employed during this monitoring program are listed in inclosure 7. The methods of analysis for specific hazardous wastes will be identified as necessary in assessment plans prepared by USAEHA.

B. Quality Control. A quality control program will be strictly followed by the laboratory to insure the validity of all results. The USAEHA will maintain quality control data records.

C. Bacterial Analysis. Coliform bacteria analysis will be performed onsite by US Army Health Services Command medical activities or centers. The MEDDACs/MEDCENs will attempt to schedule their visit such that they are onsite when sampling for other parameters is performed. Sampling equipment must be made available for their use.

VIII. SCHEDULING AND DATA REPORTING.

A. Scheduling. To insure a reasonably uniform flow of samples into the laboratory, USAEHA will schedule sampling by installations. This schedule will be established in coordination with installation personnel, and there will be some flexibility to meet installation specific requirements. Approximately 3-4 weeks prior to sampling, USAEHA will formally notify the installation environmental coordinator of the scheduled sampling by mailing a listing similar to Inclosure 8. This listing will identify the installation, the facilities to be monitored, the wells to be sampled, the analytical parameters, the installation address, the laboratory address to which samples are to be shipped and the USAEHA address to which log sheets are to be sent. The parameters listed on the notification will be grouped by common sample container. Sample containers will be shipped to the installation environmental coordinator about 2-3 weeks prior to the scheduled sampling date. The scheduled date will always be a Monday or a Tuesday and will identify the week when samples are to be taken. If is necessary for the installation to postpone sampling, telephone notification should be given to Mr. Gary Nemeth, AV 584-2024, USAEHA. Similarly, USAEHA will notify the installation if laboratory scheduling problems require postponement of sampling.

B. Field Data Log Sheets. Notify USAEHA of sample shipment the day following shipment. Copies of field data log sheets should also be mailed to USAEHA immediately after shipment of samples. USAEHA will provide blank chain of custody forms and field data logsheets.

C. Data Reporting. The USAEHA will mail a tabulation of chemical analysis results, with interpretation, to the major command and installation 1-2 weeks after receipt of raw data from the laboratory. With an expected laboratory turn-around time of 4 weeks, data will normally be received by the major command/installation about 7 weeks after sampling. If the data indicates a serious problem requiring some type of action by the installation, or if an assessment is required, the major command and installation will be notified telephonically. Installation personnel are responsible for reporting data to regulatory authorities. In many situations a copy of the data tabulation provided by USAEHA may be forwarded to meet requirements. However, some states have developed special forms for data reporting.

D. Resampling. Resampling may be necessary for a variety of reasons. Resampling will normally be directed by USAEHA through telephone contact with the installation's environmental coordinator. In those situations where resampling is desired because of indicated ground-water contamination problems the major command will also be notified.

Preparation of Ground-Water Samples from Wells Around Hazardous Waste Sites

Parameter Group	Container Size & Type	Field Preparation	Chemical Preservation	Refrigeration at 4°C using Metal Cooler and 2-3 ice packs	Special Shipment requiring 24 hour Delivery Time
Radiochemistry	1-gallon cubitaner, enclosed in a cardboard box	Filtered	Add 10 ml Nitric Acid Use the large red color-coded ampule	NO	NO
Pesticides Herbicides	1-quart glass bottle narrow neck w/teflon-lined cap, enclosed in a styrofoam pack	Unfiltered	NONE	YES	NO
Total Organic Halogen	Completely filled in a 1-quart glass bottle, narrow neck w/teflon-lined cap, enclosed in a styrofoam pack	Unfiltered	NONE	YES	NO
Metals	16-ounce wide mouth polyethylene bottle	Filtered	Add 2.5 ml Nitric Acid Use the small red color-coded ampule	NO	NO
Specific Conductance	16-ounce wide mouth polyethylene bottle	Unfiltered	NONE	YES	NO
Nitrate/Nitrite Phenol Total Organic Carbon	16-ounce glass bottle, narrow neck w/teflon-lined cap enclosed in a styrofoam pack	Filtered	Add 2 ml Sulfuric Acid Use the yellow color-coded ampule	YES	NO
Mercury	4-ounce wide mouth polyethylene bottle, enclosed in a qt cubitaner box *	Filtered	Add Nitric Acid-Dichromate Solution Use the ampule marked Nitric Acid-Dichromate	NO	NO
Fluoride Sulfate Chloride	4-ounce wide mouth polyethylene bottle, enclosed in a qt. cubitaner box *	Filtered	NONE	YES	NO

* 4/4-ounce bottles will fit in the provided qt. cubitaner box.

Inclosure 1

Preparation of Ground Water Samples from Wells Around Sanitary Landfill Sites

A. For Most Commonly Required Parameter Groupings

Parameter Group	Container Size & Type	Field Preparation	Chemical Preservation	Refrigeration at 4 °C using metal cooler & 2-3 ice packs	Special Shipment Requiring 24 hour Delivery Time
Metals (individually listed) and/or Hardness	16-oz wide mouth polyethylene bottle	Filtered	Add 2.5 ml Nitric Acid Use the small red color-coded ampule	NO	NO
Any or all of the following: TDS, TS, TSS pH[1], Turbidity Specific Conductance, Alkalinity, and Acidity	32-ounce wide mouth polyethylene bottle	Unfiltered	NONE	YES	YES, if pH and Turbidity are required
Any or all of the following: Chloride, Sulfate, Fluoride and Color	16-ounce wide mouth polyethylene bottle	Filtered	NONE	YES	YES, if Color is required
If any of the additional parameters are required: Surfactants, Nitrate, Nitrite, and Orthophosphate	Substitute a 32-ounce wide mouth polyethylene bottle for the 16-ounce one				
Any or all of the following: Phenol, COD, and TOC	16-ounce glass bottle, narrow neck, with teflon-lined cap, enclosed in a styrofoam pack	Filtered	Add 2 ml Sulfuric Acid Use the yellow color-coded ampule	YES	NO

B. Less Commonly Required Parameter Groupings

Mercury	4-ounce wide mouth polyethylene bottle, enclosed in a qt. cubitaner box[2]	Filtered	Add Nitric Acid-Dichromate Solution Use the ampule marked Nitric Acid-Dichromate	NO	NO
Radiochemistry	1-gallon cubitaner enclosed in a cardboard box	Filtered	Add 10 ml Nitric Acid Use the large red color-coded ampule	NO	NO
BOD	1-quart glass bottle, narrow neck with teflon-lined cap, enclosed in a styrofoam pack	Filtered	NONE	YES	YES

[1] - a field pH may also be required

Inclosure 2

Parameter Group	Container size and type	Field Preparation	Chemical Preservation	Refrigeration at 4°C using metal cooler & 2-3 ice packs	Special shipment Requiring 24 hour Delivery time
Cyanide	4-ounce wide mouth polyethylene bottle enclosed in a qt. cubitaner box [2]	Filtered	Add 1 pellet of Sodium Hydroxide	YES	NO
Any or all of the following: Nitrate/ Nitrite, Ammonia, TKN, and Total Phosphate	16-ounce wide mouth polyethylene bottle	Filtered	Add 2 ml Sulfuric Acid Use the yellow color-coded ampule	YES	NO
Pesticides, Herbicides	1-quart glass bottle, narrow neck, with teflon-lined cap, enclosed in a styrofoam pack	Unfiltered	NONE	YES	NO
Special Organics	1-amber glass gallon jug & two 40 ml vials completely filled	Unfiltered	NONE	YES	NO
Oil and Grease	32-ounce wide mouth glass bottle with teflon-lined cap, enclosed is a styrofoam pack	Unfiltered	Add 2 ml Sulfuric Acid Use the yellow colored-coded ampule	YES	NO
Odor and/or Taste	1-quart glass bottle, narrow neck, with teflon-lined cap, enclosed in a styrofoam pack	Unfiltered	NONE	YES	YES
Hexavalent Chromium	8-ounce wide mouth polyethylene bottle	Filtered	NONE	YES	YES
Sulfide	4-ounce wide mouth polyethylene bottle enclosed in a qt. cubitaner box	Filtered	0.5 ml. zinc Acetate solution	YES	NO

[2] - 4/4-ounce bottles will fit in the provided qt. cubitaner box

Inclosure 2 (cntd.)

GROUND-WATER MONITORING
FIELD DATA LOGSHEET

INSTALLATION: _____ WELL ID: _ _ _ _ _

DATE: _ _ _ _ _ _ _ _ _ _ _ _ _ _
day month year Julian

DEPTH TO WATER FROM TOP OF CASING: _ _ _ . _ FT

LENGTH OF CASING ABOVE GROUND SURFACE: _ _ . _ FT

DEPTH TO WATER FROM GROUND SURFACE: _ _ _ . _ FT

TIME OF MEASUREMENT: _ _ _ _ HRS

METHOD OF MEASUREMENT:

INSIDE DIAMETER OF CASING: _ _ . _ INCHES

PUMPING/SAMPLING METHOD:

AMOUNT OF WATER PUMPED PRIOR TO SAMPLING: _ _ _ GALLONS

IF TIME ALLOWED FOR WELL TO RECHARGE BEFORE SAMPLING:

TIME OF SAMPLING: _ _ _ _ HRS

DEPTH TO WATER PRIOR TO SAMPLING: (FROM TOP OF CASING) _ _ _ . _ FT

AMOUNT OF SAMPLE COLLECTED (LIST CONTAINERS FILLED):

FIELD MEASUREMENTS(IF PERFORMED):

_ _ _ °C °F temperature

pH: _ _ . _ 4 REPLICATE pH MEASUREMENTS IF A HAZARDOUS WASTE SITE

_ _ . _

_ _ . _

_ _ . _

pH METER TYPE AND MODEL:

NOTES CONCERNING CONDITION OF WELL, ODOR AND COLOR OF WATER, DEVIATIONS FROM SPECIFIED SAMPLING PROCEDURES, AND OTHER OBSERVATIONS:

SAMPLE COLLECTOR'S NAME:

WORK AREA MEASUREMENTS(IF PERFORMED): _ _ _ °C °F temperature

pH: _ _ . _ 4 REPLICATE pH MEASUREMENTS IF A HAZARDOUS WASTE SITE

_ _ . _

_ _ . _

_ _ . _

pH METER TYPE AND MODEL:

FILTERING METHOD:

TIME WHEN FILTERING AND PRESERVATION IS COMPLETED: _ _ _ _ HRS

NOTES CONCERNING USE OF ANY SPECIAL PROCEDURES OR DEVIATIONS FROM SPECIFIED PROCEDURES:

COMMENTS AND OBSERVATIONS(CONTINUE ON REVERSE SIDE IF ADDITIONAL SPACE IS NEEDED):

SAMPLE PREPARER'S NAME:

GROUND-WATER MONITORING
FIELD DATA LOGSHEET

INSTALLATION: Big Valley Army Depot

WELL ID: LF4__

DATE: 19 (day) OCT (month) 81 (year) 81292 (Julian)

DEPTH TO WATER FROM TOP OF CASING: 25.1 FT

LENGTH OF CASING ABOVE GROUND SURFACE: 2.2 FT

DEPTH TO WATER FROM GROUND SURFACE: 22.9 FT

TIME OF MEASUREMENT: 1310 HRS

METHOD OF MEASUREMENT: steel tape

INSIDE DIAMETER OF CASING: 2.0 INCHES

PUMPING/SAMPLING METHOD: geofitter pump

AMOUNT OF WATER PUMPED PRIOR TO SAMPLING: 17 GALLONS

IF TIME ALLOWED FOR WELL TO RECHARGE BEFORE SAMPLING:

TIME OF SAMPLING: ____ HRS

DEPTH TO WATER PRIOR TO SAMPLING: ____ FT
(FROM TOP OF CASING)

AMOUNT OF SAMPLE COLLECTED
(LIST CONTAINERS FILLED):

1qt part/hard
1qt TOX
2 one gal containers
16 oz spec cond

FIELD MEASUREMENTS(IF PERFORMED):

____ °C °F temperature

pH: ____ 4 REPLICATE pH MEASUREMENTS IF A HAZARDOUS WASTE SITE

pH METER TYPE AND MODEL:

NOTES CONCERNING CONDITION OF WELL, ODOR AND COLOR OF WATER, DEVIATIONS FROM SPECIFIED SAMPLING PROCEDURES, AND OTHER OBSERVATIONS:

organic solvent odor, no unusual color

SAMPLE COLLECTOR'S NAME: Joe Jackson

WORK AREA MEASUREMENTS(IF PERFORMED): 12 (°C) °F temperature

pH: 6.7, 6.7, 6.7, 6.8 — 4 REPLICATE pH MEASUREMENTS IF A HAZARDOUS WASTE SITE

pH METER TYPE AND MODEL: nonportable; Fisher Accumet

FILTERING METHOD: Vacuum

TIME WHEN FILTERING AND PRESERVATION IS COMPLETED: 1500 HRS

NOTES CONCERNING USE OF ANY SPECIAL PROCEDURES OR DEVIATIONS FROM SPECIFIED PROCEDURES:

none

COMMENTS AND OBSERVATIONS(CONTINUE ON REVERSE SIDE IF ADDITIONAL SPACE IS NEEDED):

solvent odor apparent in sample, possibly TCE.

SAMPLE PREPARER'S NAME: John Brown

GROUND-WATER MONITORING
FIELD DATA LOGSHEET

INSTALLATION: Big Bang AAP

WELL ID: RW6 __

DATE: 20 (day) Oct (month) 81 (year) — 81293 (Julian)

DEPTH TO WATER FROM TOP OF CASING: __ 7.2 FT

LENGTH OF CASING ABOVE GROUND SURFACE: __ 1.9 FT

DEPTH TO WATER FROM GROUND SURFACE: __ 5.3 FT

TIME OF MEASUREMENT: 1420 HRS

METHOD OF MEASUREMENT: steel tape

INSIDE DIAMETER OF CASING: __ 2.0 INCHES

PUMPING/SAMPLING METHOD: PVC bailer

AMOUNT OF WATER PUMPED PRIOR TO SAMPLING: __ 2 GALLONS bailed dry

IF TIME ALLOWED FOR WELL TO RECHARGE BEFORE SAMPLING:
TIME OF SAMPLING: 0730 HRS 21 Oct 81
DEPTH TO WATER PRIOR TO SAMPLING: __ 7.4 FT
(FROM TOP OF CASING)

AMOUNT OF SAMPLE COLLECTED
(LIST CONTAINERS FILLED):
1 qt pest/herb
1 qt TOX
16 oz cond
1 gal jug filled, 2nd one third filled

FIELD MEASUREMENTS (IF PERFORMED):
___ °C °F temperature
pH: __.__
__.__
__.__
__.__
4 REPLICATE pH MEASUREMENTS IF A HAZARDOUS WASTE SITE

pH METER TYPE AND MODEL:

NOTES CONCERNING CONDITION OF WELL, ODOR AND COLOR OF WATER, DEVIATIONS FROM SPECIFIED SAMPLING PROCEDURES, AND OTHER OBSERVATIONS:
Returned to well at 1700 hrs 20 Oct; well had not recharged - DTW = 15.2 FT. Water has a yellow color and an organic odor. Grout seal around well is cracked and well casing is loose in hole.

SAMPLE COLLECTOR'S NAME: Charlie Brown

WORK AREA MEASUREMENTS (IF PERFORMED): 10 °C °F temperature
pH: 5.9
5.9
5.9
5.9
4 REPLICATE pH MEASUREMENTS IF A HAZARDOUS WASTE SITE

pH METER TYPE AND MODEL: nonportable; Beckman 3500

FILTERING METHOD: Vacuum

TIME WHEN FILTERING AND PRESERVATION IS COMPLETED: 0950 HRS

NOTES CONCERNING USE OF ANY SPECIAL PROCEDURES OR DEVIATIONS FROM SPECIFIED PROCEDURES:
Insufficient sample to fill radiochemistry container initially. Sampler obtained another gallon jug full late morning 21 Oct 81. Filtered and preserved by 1300 hrs.

COMMENTS AND OBSERVATIONS (CONTINUE ON REVERSE SIDE IF ADDITIONAL SPACE IS NEEDED):
Organic odor and bright yellow color in filtered sample

SAMPLE PREPARER'S NAME: Jerry Smith

pH audit sample results on reverse

Incl 4B

Sample No.	Measured pH	Date
QC617	5.9	21 Oct 81
QC708	8.0	"

JS

US ARMY GROUND-WATER MONITORING AND ASSESSMENT PROGRAM

CHAIN OF CUSTODY RECORD

CONTAINER LISTING

SAMPLING DATE	WELL ID	CONTAINER (PARAMETERS)

	SIGNATURE	DATE/TIME	ORGANIZATION
SAMPLE COLLECTOR			
SAMPLE PREPARER			
LABORATORY CUSTODIAN			

METHOD OF SHIPMENT:

COMMENTS:

Incl 5

US ARMY GROUND-WATER MONITORING AND ASSESSMENT PROGRAM

CHAIN OF CUSTODY RECORD

CONTAINER LISTING

SAMPLING DATE	WELL ID	CONTAINER (PARAMETERS)
21 Oct 81	RW6	pest/herb
	"	TOH
	"	Cond
	"	NO_3/NO_2, Phenol, TOC
	"	F, Cl, SO_4
	RW4, RW3	TOH
	" "	pest/herb
	" "	Cond
	" "	NO_3/NO_2, Phenol, TOC
	" "	F, Cl, SO_4
	RW1, RW2 RW3, RW4, RW6	Hg

	SIGNATURE	DATE/TIME	ORGANIZATION
SAMPLE COLLECTOR	Charlie Brown	21 Oct 81/0830 hrs	BIG BANG AAP
SAMPLE PREPARER	Jerry Smith	21 Oct 81/0930 hrs	"
LABORATORY CUSTODIAN			

METHOD OF SHIPMENT: UPS Blue Label

COMMENTS:

PARAMETER	PRIMARY METHODOLOGY	ALTERNATE METHODOLOGY[1]
Barium	EPA[2] 200.0, 208.1	
Sodium	200.0, 273.1	
Copper	200.0, 220.1	
Zinc	200.0, 289.1	
Manganese	200.0, 243.1	
Silver	200.0, 272.1	
Iron	200.0, 236.1	200.0, 236.2
Potassium	200.0, 258.1	
Magnesium	200.0, 242.1	
Calcium	200.0, 215.1	
Chromium	200.0, 218.2	200.0, 218.1
Cadmium	200.0, 213.2	200.0, 213.1
Lead	200.0, 239.2	
Arsenic	200.0, 206.2	200.0, 206.3
Selenium	200.0, 270.2	200.0, 270.3
Mercury	200.0, 245.1	200.0, 245.2
Specific Conductance	120.1	
Total Organic Carbon	415.1	
Total Organic Halogen	450.1	
Fluoride	340.2	340.3
Nitrate/Nitrite	353.2	353.1
Nitrite	353.2 (without Reduction Steps)	353.1
Ammonia	350.1, 350.2	350.1
Total Kjeldahl Nitrogen	351.2	351.3
Phenols	420.2	
Total Phosphate	365.4	365.2
Ortho Phosphate	365.4 (without Digestion)	365.2

PARAMETER	PRIMARY METHODOLOGY	ALTERNATE METHODOLOGY
Acidity	305.1	
Alkalinity	310.1	
Hardness EDTA	130.2	
Total Solids	160.3	
Total Suspended Solids	160.2	
Total Dissolved Solids	160.1	
Chloride	325.2	325.3
Sulfate	375.2	375.1
Surfactants	425.1	
Chemical Oxygen Demand	410.4	Ampule Method [3]
Turbidity	180.1	
Color	110.2	
Endrin	Methods for Organochlorine[4]	
Lindane	Methods for Organochlorine	
Toxaphene	Methods for Organochlorine	
Methoxychlor	Methods for Organochlorine	
2, 4-D	Methods for Organochlorine	
2, 4, 5, T-P (Silvex)	Methods for Organochlorine	
Oil & Grease	413.2	
Biochemical Oxygen Demand	405.1	
Gross Alpha	SM[5] 703	
Radium-226	SM 706	
Radium-228	SM 705	
Gross Beta	SM 703	
Strontium-90	SM 704	
Tritium	SM 707	

PARAMETER	PRIMARY METHODOLOGY	ALTERNATE METHODOLOGY
Uranium	Laser [6]	
Taste	SM 211A	
Acid Extractable Organics	FR[7] 625	FR 604
Base/Neutral Extractable Organics	FR 625	
Pesticide & PCB Extractable Organics	FR 625	
Volatile Organics	FR 624	FR 601
pH	150.1	
Odor	SM[8] (Quality)	140.1
Nitrate	353.2 (with and without Reduction Steps)	353.1
Cyanide	335.3	
Sulfide	376.2	
Nickel	200.0, 249.1	
Vanadium	200.0, 286.2	
Antimony	200.0, 204.2	
Beryllium	200.0, 210.1	
Thallium	200.0, 279.1	
Hexavalent Chromium	218.4	

1 – The selected alternate methods will be on an infrequent basis only if a need arises.

2 – Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020, US Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268, March 1979. All the methods listed are from this methods manual except for those individually marked with preletters.

3 – "Ampule Method", Chemical Oxygen Demand, Oceanography International Corporation, College Station, TX 77840, April 1978.

4 – "Methods for Organochlorine Pesticides and Chlorophenoxy Acid Herbicides in Drinking Water and Raw Source Water", available from ORD Publications, CERI, EPA, Cincinnati, OH 45268, July 1978.

5 – Standard Methods for the Examination of Water and Wastewater, 14th ed., American Public Health Association, Amercian Water Works Association, Water Pollution Control Federation, Washington, DC 20036, 1975.

6 - "Laser Induced Phosphorescence Procedure for Uranium", Radiation Management Corp, Philadelphia, PA, 19104, 1981.

7 - EPA methods listed in Federal Register, Vol. 44, No. 233, Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations, Monday, December 3, 1979.

8 - Standard Methods for the Examination of Water, Sewage, and Industrial Wastes, 10th ed., American Public Health Association, American Water Works Association, Federation of Sewage & Industrial Wastes Associations, New York 19 NY, 1955.

..... EXAMPLE .....

SCHEDULED SAMPLING AND ANALYSIS

Big Bang AAP
Red Water Lagoon
Sludge Basin
Landfill

Scheduled Sampling: 19 Oct 81

16 Wells: RW1, RW2, RW3, RW4, RW6, SB1, SB2, SB3, SB4, SB5, LF1, LF2, LF3, LF4, LF5, LF6

Ba	Endrin	TOX(4)	Gross Alpha
As	Lindane		Gross Beta
Cd	Toxaphene		
Cr	Methoxychlor		
Pb	2,4-D		
Se	Silvex		
Ag			
Na			
Mn			
Fe			

NO_2/NO_3	Spec Cond(4)	F	Hg
Phenol		Cl	
TOC(4)		SO_4	

Commander
Big Bang AAP
Attn: SAREB-FE-E
Westwood, USA

Century Environmental Testing Laboratories, Inc.
1501 Grandview Avenue
MidAtlantic Park
Thorofare, NJ 08086

Commander
US Army Environmental Hygiene Agency
Attn: HSE-ES-S/Gary Nemeth
Aberdeen Proving Ground, MD 21010
AV 584-2024, (301) 671-2024

SUPPLEMENT 1

TO

US ARMY GROUND-WATER MONITORING
AND ASSESSMENT PROGRAM

INSTRUCTIONS
FOR
COLLECTION
PREPARATION AND SHIPMENT
OF SAMPLES

US ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MD
APRIL 1982

Paragraph V.E.

6. Ground-water samples requiring analysis for any or all of the following explosives: 2,4,6-TNT, 2,4-DNT, 2,6-DNT, RDX, HMX, and Tetryl should be filtered (0.45 micron membrane filter) and then transferred to a clean 16-ounce glass bottle (narrow neck w/teflon-lined cap enclosed in a styrofoam pack). After transferring the sample to the bottle, add 10% sulfuric acid (H_2SO_4) drop-wise to obtain a sample pH of 4-5. If the sample already has a pH in the 3-6 range, don't add any acid to it. A commercial pH paper roll having an expanded scale range from about pH 3 to 7 can be used for this measurement. It is inoperative not to overacidify the sample. The H_2SO_4 should be prepared from a reagent grade or "more pure" grade concentrated H_2SO_4; a 10% concentration is achieved by adding 10 parts H_2SO_4 to 90 parts distilled or deionized water. In most cases, a full bottle of sample is not necessary. If difficulty results in obtaining a fairly full bottle, 100-200 milliliters of sample will be sufficient for explosive analysis.

7. Ground-water samples requiring analysis for volatile organic compounds, whether they are halogenated organics or purgeable non-halogenated aromatic or aliphatic compounds, must be collected in the specially designed and cleaned 40 ml glass vials equipped with a teflon-faced silicone septum and screw cap. These samples must be collected right at the sampling well immediately after extracting the samples from the well. Special care must be taken to insure completely filled vials, so that no bubbles or head space occurs. Also, the teflon-lined side of the septum must face the sample. It is imperative that these vials not be used for any other purpose, and if a vial is accidently soiled, it should not be used. A sample blank vial containing the installation's organic free water should accompany every batch of volatile organic samples.

8. The filled sample containers for explosives, volatile organics, pesticides/herbicides, and any other samples for organics analysis must be kept cold and protected from light.

Paragraph V.F.

5. The filtering apparatus used for filtering samples for the explosive parameters should be rinsed with reagent grade acetone or equivalent and then thoroughly rinsed with distilled or deionized water between each sample filtering. It is important that no acetone be left on the apparatus as it may come in contact with the membrane filter and dissolve it.

Paragraph VI.B.

5. Samples for explosives or volatile organics analysis must be shipped as soon as possible after sampling (within 24 hours) and a 24 hour delivery service must be used. These samples will be analyzed either by USAEHA or the contract laboratory on a case by case basis.

APPENDIX E

ANALYTICAL RESULTS

SITE 1

Table I. Crane Naval Weapons Support Center. January 1985
Groundwater Sampling Project. Area 1-CERCLA - Inorganic

ATEC Lab No.	179-84	180-85	181-85
Well No.	1-1	1-2	1-3
Date Sampled	1/8/85	1/7/85	1/7/85
pH, Field, S.U.	5.8	7.2	7.8
Cond., Field, umho	1540	500	360
Chloride, mg/l	12	6	2
Iron, ug/l	450	860	30
Manganese, ug/l	2400	180	90
Phenols, ug/l	<50	<50	50
Sodium, mg/l	48	53	8.1
Sulfate, mg/l	320	29	42
TOC, mg/l	3.5	1.8	3.9
TOX, ug/l	11	5700	129

ATEC Lab No.	182-85	183-85	184-85
Well No.	1-4	1-5	1-6
Date Sampled	1/7/85	1/7/85	1/7/85
pH, Field, S.U.	7.7	7.1	6.2
Cond., Field, umho	1320	2300	1300
Chloride, mg/l	3	1	1
Iron, ug/l	240	970	<20
Manganese, ug/l	80	5400	100
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	121	172	46
Sulfate, mg/l	420	700	340
TOC, mg/l	4.4	4.6	4.6
TOX, ug/l	39	915	14

Table I. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 1-CERCLA. - Inorganic

ATEC Lab No.	185-85	186-85	187-85
Well No.	1-7	1-8	1-9
Date Sampled	1/7/85	1/7/85	1/7/85
pH, Field, S.U.	6.4	6.4	5.7
Cond., Field, umho	1200	500	290
Chloride, mg/l	2	<1	<1
Iron, ug/l	270	2990	30
Manganese, ug/l	1400	670	10
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	26	9.1	4.9
Sulfate, mg/l	290	120	63
TOC, mg/l	3.9	3.9	5.4
TOX, ug/l	6.7	18	91

ATEC Lab No.	188-85	189-85	190-85
Well No.	1-10	1-11	1-12
Date Sampled	1/7/85	1/7/85	1/7/85
pH, Field, S.U.	7.0	7.7	7.2
Cond., Field, umho	850	300	730
Chloride, mg/l	<1	<1	<1
Iron, ug/l	340	<20	370
Manganese, ug/l	870	40	340
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	21	4.7	17
Sulfate, mg/l	140	15	120
TOC, mg/l	<0.5	2.4	1.4
TOX, ug/l	6.5	386	1530

Table I. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 1-CERCLA.- Inorganic

ATEC Lab No.	191-85	192-85	193-85
Well No.	1-13	1-14	1-15
Date Sampled	1/7/85	1/7/85	1/7/85
pH, Field, S.U.	7.2	6.2	6.1
Cond., Field, umho	580	1520	1500
Chloride, mg/l	1	3	3
Iron, ug/l	150	210	5210
Manganese, ug/l	30	4300	2600
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	13	51	36
Sulfate, mg/l	130	360	290
TOC, mg/l	<0.5	9.6	<0.5
TOX, ug/l	370	159	590

ATEC Lab No.	194-85	195-85	196-85
Well No.	1-16	1-17	1-18
Date Sampled	1/7/85	1/7/85	1/7/85
pH, Field, S.U.	7.1	6.3	6.8
Cond., Field, umho	800	1200	850
Chloride, mg/l	5	3	<1
Iron, ug/l	<20	<20	8350
Manganese, ug/l	110	160	1200
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	21	64	40
Sulfate, mg/l	170	280	170
TOC, mg/l	2.9	<0.5	5.4
TOX, ug/l	1210	181	89

Table I. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 1-CERCLA.- Inorganic

ATEC Lab No.	197-85	198-85	199-85
Well No.	1-19	1-20	1-21
Date Sampled	1/8/85	1/8/85	1/8/85
pH, Field, S.U.	6.8	7.4	6.2
Cond., Field, umho	1800	1500	650
Chloride, mg/l	2	<1	<1
Iron, ug/l	50	1600	7280
Manganese, ug/l	70	640	690
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	83	29	16
Sulfate, mg/l	340	670	210
TOC, mg/l	5.1	1.8	5.4
TOX, ug/l	990	15	138

ATEC Lab No.	200-85	201-85	202-85
Well No.	1-22	1-23	1-24
Date Sampled	1/8/85	1/7/85	1/7/85
pH, Field, S.U.	6.5	6.7	6.6
Cond., Field, umho	1900	2340	445
Chloride, mg/l	1	<1	<1
Iron, ug/l	160	500	70
Manganese, ug/l	240	450	690
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	113	50	21
Sulfate, mg/l	370	990	42
TOC, mg/l	4.4	4.5	2.7
TOX, ug/l	257	6.3	<5.0

Table I. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 1-CERCLA. - Inorganic

ATEC Lab No.	203-85	204-85	205-85
Well No.	1-25	1-26	1-27
Date Sampled	1/8/85	1/8/85	1/8/85
pH, Field, S.U.	6.0	5.9	6.6
Cond., Field, umho	2000	1900	1530
Chloride, mg/l	<1	<1	4
Iron, ug/l	<20	2060	30
Manganese, ug/l	320	2440	1090
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	127	67	79
Sulfate, mg/l	400	360	170
TOC, mg/l	10.0	9.5	2.9
TOX, ug/l	102	17	112

Table II. Crane Naval Weapons Support Center. January 1985
Groundwater Sampling Project. Area 1-CERCLA - Organic

ATEC Lab No.	180-85	183-85	189-85
Well No.	1-2	1-5	1-11
Date Sampled	1/8/85	1/7/85	1/7/85
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 1.0	< 1.0	< 1.0
Chloroethane	< 10	< 10	< 10
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	< 1.0	< 1.0	< 1.0
Dichlorobromomethane	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane	< 10	< 10	< 10
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	< 1.0	< 1.0	< 1.0
Methyl Bromide	< 10	< 10	< 10
Methyl Chloride	< 10	< 10	< 10
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	525	85.9	138
Tetrachloroethene	187	3.8	5.2
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	24.3	< 1.0	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	2.2	4.6	1.1
Trichloroethene	1180	1010	200
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 10	< 10	< 10

All concentrations expressed as ug/l.

Table II. (Cont'd.) Crane Naval Weapons Support Center. January 1985 Groundwater Sampling Project. Area 1-CERCLA - Organic

ATEC Lab No.	190-85	191-85	192-85
Well No.	1-12	1-13	1-14
Date Sampled	1/7/85	1/7/85	1/7/85
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	61	< 1.0	< 1.0
Chloroethane	< 10	< 10	< 10
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	13	< 1.0	3.3
Dichlorobromomethane	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane	< 10	< 10	< 10
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	< 1.0	< 1.0	< 1.0
Methyl Bromide	< 10	< 10	< 10
Methyl Chloride	< 10	< 10	< 10
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	518	14.4	64.8
Tetrachloroethene	1.4	< 1.0	< 1.0
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	19.3	< 1.0	3.6
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	5.2	< 1.0	< 1.0
Trichloroethene	644	8.6	53.1
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 10	< 10	< 10

All concentrations expressed as ug/l.

Table II. (Cont'd.) Crane Naval Weapons Support Center. January 1985 Groundwater Sampling Project. Area 1-CERCLA - Organic

ATEC Lab No.	193-85	194-85	195-85
Well No.	1-15	1-16	1-17
Date Sampled	1/7/85	1/7/85	1/7/85
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 1.0	< 1.0	< 1.0
Chloroethane	< 10	< 10	< 10
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	13.8	14.0	< 1.0
Dichlorobromomethane	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane	< 10	< 10	< 10
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	< 1.0	< 1.0	< 1.0
Methyl Bromide	< 10	< 10	< 10
Methyl Chloride	< 10	< 10	< 10
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	230	870	< 1.0
Tetrachloroethene	3.5	2.9	< 1.0
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	14.8	14.6	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	12.6	30.2	< 1.0
Trichloroethene	301	513	< 1.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 10	< 10	< 10

All concentrations expressed as *ug*/l.

Table II. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 1-CERCLA - Organic

ATEC Lab No.	197-85	200-85
Well No.	1-19	1-22
Date Sampled	1/8/85	1/8/85
Acrolein	< 100	< 100
Acrylonitrile	< 100	< 100
Benzene	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0
Chlorodibromomethane	< 1.0	< 1.0
Chloroethane	< 10	< 10
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0
Chloroform	11.0	4.4
Dichlorobromomethane	< 1.0	< 1.0
Dichlorodifluoromethane	< 10	< 10
1,1-Dichloroethane	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0
Ethyl Benzene	< 1.0	10.5
Methyl Bromide	< 10	< 10
Methyl Chloride	< 10	< 10
Methylene Chloride	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	146	65.3
Tetrachloroethene	7.1	< 1.0
Toluene	5.0	5.1
trans-1,2-Dichloroethene	12.1	7.1
1,1,1-Trichloroethane	< 1.0	< 1.0
1,1,2-Trichloroethane	5.7	< 1.0
Trichloroethene	221	117
Trichlorofluoromethane	< 1.0	< 1.0
Vinyl Chloride	< 10	< 10

All concentrations expressed as ug/l.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: M 1-1
ERG SAMPLE NO: 06/110467
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.07	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	1200	umho/c
pH, FIELD,	6.4	S.U.

CLIENT I.D.: M 1-2
ERG SAMPLE NO: 06/110468
MATRIX: GROUND WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	34	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.15	mg/L
CONDUCTANCE, SPECIFIC	1000	umho/c
pH, FIELD,	6.9	S.U.

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: M 1-3
ERG SAMPLE NO: 06/110469
MATRIX: GROUND WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.06	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.007	mg/L
CONDUCTANCE, SPECIFIC	400	umho/cm
pH, FIELD,	7.2	S.U.

CLIENT I.D.: M 1-4
ERG SAMPLE NO: 06/110470
MATRIX: GROUND WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	0.008	mg/L
ORGANIC IODINE	0.009	mg/L
CONDUCTANCE, SPECIFIC	1800	umho/cm
pH, FIELD,	6.9	S.U.

CLIENT I.D.: M 1-5
ERG SAMPLE NO: 06/110471
MATRIX: GROUND WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.45	mg/L
ORGANIC BROMIDE	0.010	mg/L
ORGANIC IODINE	0.010	mg/L
CONDUCTANCE, SPECIFIC	2300	umho/cm
pH, FIELD,	7.3	S.U.

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: M 1-7
ERG SAMPLE NO: 06/110472
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L

CLIENT I.D.: M 1-10
ERG SAMPLE NO: 06/110473
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L

CLIENT I.D.: M 1-11
ERG SAMPLE NO: 06/110474
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	1.5	mg/L
ORGANIC BROMIDE	0.010	mg/L
ORGANIC IODINE	0.017	mg/L

CLIENT I.D.: M 1-12
ERG SAMPLE NO: 06/110475
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.56	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.004	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: M 1-13
ERG SAMPLE NO: 06/110476
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.21	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.011	mg/L

CLIENT I.D.: M 1-14
ERG SAMPLE NO: 06/110477
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.25	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.044	mg/L

CLIENT I.D.: M 1-15
ERG SAMPLE NO: 06/110478
MATRIX: NATURAL WATER
DATE COLLECTED: 06-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.24	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.024	mg/L

CLIENT I.D.: M 1-16
ERG SAMPLE NO: 06/110479
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	1.0	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.007	mg/L

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: M 1-17
ERG SAMPLE NO: 06/110480
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.017	mg/L

CLIENT I.D.: M 1-19
ERG SAMPLE NO: 06/110481
MATRIX: NATURAL WATER
DATE COLLECTED: 06-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.26	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.014	mg/L

CLIENT I.D.: M 1-20
ERG SAMPLE NO: 06/110482
MATRIX: NATURAL WATER
DATE COLLECTED: 06-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.04	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L

CLIENT I.D.: M 1-21
ERG SAMPLE NO: 06/110483
MATRIX: NATURAL WATER
DATE COLLECTED: 06-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.29	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.004	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: M 1-22
ERG SAMPLE NO: 06/110484
MATRIX: NATURAL WATER
DATE COLLECTED: 06-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.26	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.005	mg/L

CLIENT I.D.: M 1-23
ERG SAMPLE NO: 06/110485
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.42	mg/L
ORGANIC BROMIDE	0.008	mg/L
ORGANIC IODINE	0.014	mg/L

CLIENT I.D.: M 1-24
ERG SAMPLE NO: 06/110486
MATRIX: NATURAL WATER
DATE COLLECTED: 06-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.23	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L

CLIENT I.D.: M 1-25
ERG SAMPLE NO: 06/110487
MATRIX: NATURAL WATER
DATE COLLECTED: 06-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.08	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.007	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: M 1-26
ERG SAMPLE NO: 06/110488
MATRIX: NATURAL WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.011	mg/L

CLIENT I.D.: M 1-27
ERG SAMPLE NO: 06/110489
MATRIX: NATURAL WATER
DATE COLLECTED: 06-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.005	mg/L

FR - SEE FIELD REPORT FOR RESULT
NA - NOT APPLICABLE TO TEST REQUESTED
ND - NONDETECTED, DETECTION LIMIT IN ()
SD - SAMPLE DAMAGED
SR - SEE ATTACHED REPORT FOR RESULT
< - POSITIVE RESULT BUT AT UNQUANTIFIABLE CONCENTRATION BELOW INDICATED LEVEL

THANK YOU FOR YOUR BUSINESS !

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

7777 EXCHANGE STREET
CLEVELAND, OHIO 44125 (216) 447-0790

PROJECT V6998
REPORT DATE 04-30-84

CLIENT P.O.: CLEVELAND
REPORT: 6798

SAMPLES RECVD: 02-07-84
REFER TECHNICAL QUESTIONS
TO: JAMES BOLOER

CLIENT:
COMMANDER
CRANE N.W.S.C.
CODE 0924 CATHY ANDREWS
CRANE, INDIANA 47522

ATTENTION: CATHY ANDREWS

APPROVED:

***
RESIDUAL SAMPLES WILL
BE HELD FOR TWO WEEKS
***

CLIENT I.D.: SMART REPORT
ERG SAMPLE NO: 02/102259
MATRIX: SPECIAL REPORTS
DATE COLLECTED: NG

PARAMETER	RESULTS	UNITS

CLIENT I.D.: M-1-1-(A)
ERG SAMPLE NO: 02/102260
MATRIX: NATURAL WATER
DATE COLLECTED: 01-31-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.002	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	1200	umho/cm
pH, FIELD	6.5	S.U.
CHLORIDE	46	mg/L
IRON, TOTAL	0.59	mg/L
MANGANESE, TOTAL	2.7	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	43	mg/L
SULFATE	340	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6498 - COMMANDER 04-30-84

CLIENT I.D.: M-1-2 (A)
ERG SAMPLE NO: 02/102264
MATRIX: NATURAL WATER
DATE COLLECTED: 01-31-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	30	mg/L
ORGANIC BROMIDE	ND (0.004)	mg/L
ORGANIC IODINE	0.036	mg/L
CARBON, TOTAL ORGANIC	5	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/cm
pH, FIELD	6.6	S.U.
CHLORIDE	96	mg/L
IRON, TOTAL	0.01	mg/L
MANGANESE, TOTAL	0.62	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	110	mg/L
SULFATE	440	mg/L

CLIENT I.D.: M-1-3 (A)
ERG SAMPLE NO: 02/102268
MATRIX: NATURAL WATER
DATE COLLECTED: 01-31-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	1.3	mg/L
ORGANIC BROMIDE	0.016	mg/L
ORGANIC IODINE	0.006	mg/L
CARBON, TOTAL ORGANIC	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	340	umho/cm
pH, FIELD	6.9	S.U.
CHLORIDE	8	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	<0.005	mg/L
PHENOLS	<0.004	mg/L
SODIUM, TOTAL	12	mg/L
SULFATE	86	mg/L

CLIENT I.D.: M-1-4 (A)
ERG SAMPLE NO: 02/102272
MATRIX: NATURAL WATER
DATE COLLECTED: 01-31-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.39	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

CLIENT I.D.: M-1-4 (A)
ERG SAMPLE NO: 02/102272
MATRIX: NATURAL WATER
DATE COLLECTED: 01-31-84

PARAMETER	RESULTS	UNITS
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/c
pH, FIELD,	6.7	S.U.
CHLORIDE	19	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	0.10	mg/L
PHENOLS	<0.004	mg/L
SODIUM, TOTAL	120	mg/L
SULFATE	470	mg/L

CLIENT I.D.: M-1-5 (A)
ERG SAMPLE NO: 02/102276
MATRIX: NATURAL WATER
DATE COLLECTED: 01-31-84

PARAMETER	RESULTS	UNITS
HALOSCAN - I		
ORGANIC CHLORIDE	0.14	mg/L
ORGANIC BROMIDE	0.005	mg/L
ORGANIC IODINE	0.006	mg/L
CARBON, TOTAL ORGANIC,	7	mg/L
CONDUCTANCE, SPECIFIC	8100	umho/c
pH, FIELD,	6.7	S.U.
CHLORIDE	94	mg/L
IRON, TOTAL	0.05	mg/L
MANGANESE, TOTAL	6.6	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	140	mg/L
SULFATE	900	mg/L

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
WATER								
LEVELS (A)	26 JUL 83		FT	659.7	658.3	656.7	653.4	653.4
PH(FIELD)	26 JUL 83		PH	6.1		6.7		6.6
PH(FIELD)	26 JUL 83		PH	6.1		6.8		6.6
PH(FIELD)	26 JUL 83		PH	6.1		6.7		6.6
PH(FIELD)	26 JUL 83		PH	6.2		6.6		6.6
PH(FIELD)	27 JUL 83		PH		6.5		6.8	
PH(FIELD)	27 JUL 83		PH		6.4		6.7	
PH(FIELD)	27 JUL 83		PH		6.5		6.6	
PH(FIELD)	27 JUL 83		PH		6.5		6.8	
SPEC COND	26 JUL 83	1.	UMC	1400.		1850.		1950.
SPEC COND	26 JUL 83	1.	UMC	1400.		1800.		1950.
SPEC COND	26 JUL 83	1.	UMC	1350.		1800.		1950.
SPEC COND	26 JUL 83	1.	UMC	1400.		1800.		1950.
SPEC COND	27 JUL 83	1.	UMC		650.		2460.	
SPEC COND	27 JUL 83	1.	UMC		650.		2460.	
SPEC COND	27 JUL 83	1.	UMC		650.		2460.	
SPEC COND	27 JUL 83	1.	UMC		650.		2460.	
TOC	26 JUL 83	1.0	MGL	56.0		25.0		42.0
TOC	26 JUL 83	1.0	MGL	55.0		25.0		43.0
TOC	26 JUL 83	1.0	MGL	56.0		25.0		43.0
TOC	26 JUL 83	1.0	MGL	55.0		25.0		44.0
TOC	27 JUL 83	1.0	MGL		32.0		72.0	
TOC	27 JUL 83	1.0	MGL		31.0		70.0	
TOC	27 JUL 83	1.0	MGL		31.0		71.0	
TOC	27 JUL 83	1.0	MGL		32.0		71.0	
TOX	26 JUL 83	.010	MGL	.074 C		.011 C		15.260 C
TOX	26 JUL 83	.010	MGL	.069 C		.013 C		14.490 C
TOX	26 JUL 83	.010	MGL	.068 C		.014 C		12.800 C
TOX	26 JUL 83	.010	MGL	.045 C		.013 C		13.720 C
TOX	27 JUL 83	.010	MGL		.091 C		.390 C	
TOX	27 JUL 83	.010	MGL		.100 C		.400 C	
TOX	27 JUL 83	.010	MGL		.061 C		.400 C	
TOX	27 JUL 83	.010	MGL		.097 C		.410 C	

Tab 8

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 1-1 (BACKGROUND WELL)

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.500	1240.625	20.875	.016
BACKGROUND STANDARD DEV	.115	61.070	24.149	.013
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.125	1387.500	55.500	.064
CALCULATED STANDARD DEV	.050	25.000	.577	.013
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	6.273	4.636	2.810	6.610
ACCEPT TEST?	REJECT	REJECT	REJECT	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 1-2

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.500	1240.625	20.875	.016
BACKGROUND STANDARD DEV	.115	61.070	24.149	.013
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.600	1950.000	43.000	14.067
CALCULATED STANDARD DEV	.000	.000	.816	1.053
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	1.704	22.762	1.795	58.437
ACCEPT TEST?	OK	REJECT	OK	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 1-3

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.500	1240.625	20.875	.016
BACKGROUND STANDARD DEV	.115	61.070	24.149	.013
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.475	650.000	31.500	.087
CALCULATED STANDARD DEV	.050	.000	.577	.018
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	.418	-18.952	.862	9.146
ACCEPT TEST?	OK	OK	OK	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 1-4

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.500	1240.625	20.875	.016
BACKGROUND STANDARD DEV	.115	61.070	24.149	.013
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.700	1812.500	25.000	.013
CALCULATED STANDARD DEV	.082	25.000	.000	.001
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	3.248	18.050	.335	-.489
ACCEPT TEST?	REJECT	REJECT	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 1-5

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.500	1240.625	20.875	.016
BACKGROUND STANDARD DEV	.115	61.070	24.149	.013
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.725	2460.000	71.000	.400
CALCULATED STANDARD DEV	.096	.000	.816	.008
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	3.593	39.127	4.067	55.727
ACCEPT TEST?	REJECT	REJECT	REJECT	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
WATER LEVELS (A)	26 JUL 83		FT	659.7	658.3	656.7	653.4	653.4
PH(FIELD)	26 JUL 83		PH	6.1		6.8		6.6
PH(FIELD)	26 JUL 83		PH	6.1		6.7		6.6
PH(FIELD)	26 JUL 83		PH	6.2		6.6		6.6
PH(FIELD)	26 JUL 83		PH	6.1		6.7		6.6
PH(FIELD)	27 JUL 83		PH		6.5		6.8	
PH(FIELD)	27 JUL 83		PH		6.5		6.6	
PH(FIELD)	27 JUL 83		PH		6.4		6.8	
PH(FIELD)	27 JUL 83		PH		6.5		6.7	
SPEC COND	26 JUL 83	1.	UMC	1400.		1850.		1950.
SPEC COND	26 JUL 83	1.	UMC	1400.		1800.		1950.
SPEC COND	26 JUL 83	1.	UMC	1350.		1800.		1950.
SPEC COND	26 JUL 83	1.	UMC	1400.		1800.		1950.
SPEC COND	27 JUL 83	1.	UMC		650.		2460.	
SPEC COND	27 JUL 83	1.	UMC		650.		2460.	
SPEC COND	27 JUL 83	1.	UMC		650.		2460.	
SPEC COND	27 JUL 83	1.	UMC		650.		2460.	
TOC	26 JUL 83	1.0	MGL	56.0		25.0		43.0
TOC	26 JUL 83	1.0	MGL	55.0		25.0		43.0
TOC	26 JUL 83	1.0	MGL	56.0		25.0		44.0
TOC	26 JUL 83	1.0	MGL	55.0		25.0		42.0
TOC	27 JUL 83	1.0	MGL		32.0		70.0	
TOC	27 JUL 83	1.0	MGL		31.0		71.0	
TOC	27 JUL 83	1.0	MGL		31.0		71.0	
TOC	27 JUL 83	1.0	MGL		32.0		72.0	
TOX	26 JUL 83	.010	MGL	.069 C		.011 C		12.800 C
TOX	26 JUL 83	.010	MGL	.068 C		.013 C		13.720 C
TOX	26 JUL 83	.010	MGL	.045 C		.013 C		15.260 C
TOX	26 JUL 83	.010	MGL	.074 C		.014 C		14.490 C
TOX	27 JUL 83	.010	MGL		.100 C		.400 C	
TOX	27 JUL 83	.010	MGL		.091 C		.400 C	
TOX	27 JUL 83	.010	MGL		.097 C		.390 C	
TOX	27 JUL 83	.010	MGL		.061 C		.410 C	

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

CRANE NWSC
PURGEABLE ORGANIC PRIORITY POLLUTANTS
COMPOUNDS DETECTED AND RESULTS (ug/L)
SAMPLES COLLECTED ON 27 JUNE 1983

	Travel Blank	1-18	1-19*	1-20*	1-21
Methylene chloride	2	6		1	3
1,1,1-trichloroethane		1		1	1
trichloroethylene		2	350	430	
benzene		1			2
trichlorofluoromethane			2		
chloroform			15		
1,2-dichloroethane			19		
1,1-dichloroethylene				6	
toluene	2				

* Confirmed by mass spectroscopy.
Note: Blank space indicates not detected.

INCL 12

from 16 Nov. corresp.

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

CRANE NWSC
PURGEABLE ORGANIC PRIORITY POLLUTANTS
COMPOUNDS DETECTED AND RESULTS (ug/L)
SAMPLES COLLECTED ON 14 JULY 1983

	1-22*	1-23	1-24
Methylene chloride		6	2
1,1,1-trichloroethane	2	2	1
trichloroethylene	80	2	
benzene	3		
chloroform	4	2	
1,2-dichloroethane	3		
1,1,2,2-tetrachloroethane	50		

* Confirmed by mass spectroscopy.
Note: Blank space indicates not detected.

Tab 1 13

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

CRANE NWSC
RADIOCHEMISTRY RESULTS

Well	Sampling Date	Radium-226	Strontium-90
1-5	5 Oct 82	.32	

INCL 18

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
WATER LEVELS (A)	22 FEB 83		FT	658.2	661.7	656.7	654.1	654.6
CHLORIDE	22 FEB 83	1.0	MGL	43.0	6.0	21.0	88.0	82.0
IRON	22 FEB 83	.03	MGL	ND	.11	ND	ND	ND
MANGANESE	22 FEB 83	.01	MGL	1.86#	.01	1.09#	4.50#	.71#
PHENOL	22 FEB 83	.01	MGL	ND	ND	ND	ND	ND
SODIUM	22 FEB 83	1.	MGL	45.	17.	132.	182.	87.
SULFATE	22 FEB 83	5.0	MGL	280.0#	33.0	430.0#	940.0#	190.0
PH(FIELD)	22 FEB 83		PH	6.3#	7.2	7.1	6.8	6.9
PH(FIELD)	22 FEB 83		PH	6.3#	7.2	7.1	6.8	7.0
PH(FIELD)	22 FEB 83		PH	6.3#	7.2	7.0	6.8	7.0
PH(FIELD)	22 FEB 83		PH	6.3#	7.2	7.0	6.8	6.9
SPEC COND	22 FEB 83	1.	UMC	1065.	590.	1375.	2520.	1220.
SPEC COND	22 FEB 83	1.	UMC	1060.	590.	1375.	2500.	1220.
SPEC COND	22 FEB 83	1.	UMC	1060.	595.	1380.	2500.	1225.
SPEC COND	22 FEB 83	1.	UMC	1065.	590.	1380.	2520.	1225.
TOC	22 FEB 83	1.0	MGL	44.0	25.0	22.0	44.0	42.0
TOC	22 FEB 83	1.0	MGL	42.0	26.0	23.0	43.0	42.0
TOC	22 FEB 83	1.0	MGL	43.0	24.0	22.0	45.0	41.0
TOC	22 FEB 83	1.0	MGL	43.0	24.0	22.0	44.0	41.0
TOX	22 FEB 83	.010	MGL	.021 C	ND	.011 C	.750 C	17.320 C
TOX	22 FEB 83	.010	MGL	.019 C	.010 C	.013 C	.730 C	16.600 C
TOX	22 FEB 83	.010	MGL	.015 C	ND	.018 C	.750 C	17.580 C
TOX	22 FEB 83	.010	MGL	.017 C	ND	.012 C	.750 C	17.100 C

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: MUSTARD GAS BURIAL SITE

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 1-2	1-10	1-11	1-12	1-13	1-14
BENZENE	18 NOV 82	1.	UGL	ND					
BENZENE	11 JAN 83	1.	UGL			ND			
BENZENE	25 JAN 83	1.	UGL		1.		ND	ND	
BENZENE	31 JAN 83	1.	UGL						ND
CARBON TETRACHLORIDE	18 NOV 82	1.	UGL	ND					
CARBON TETRACHLORIDE	11 JAN 83	1.	UGL			ND			
CARBON TETRACHLORIDE	25 JAN 83	1.	UGL		ND		ND	ND	
CARBON TETRACHLORIDE	31 JAN 83	1.	UGL						ND
CHLOROBENZENE	18 NOV 82	1.	UGL	ND					
CHLOROBENZENE	11 JAN 83	1.	UGL			ND			
CHLOROBENZENE	25 JAN 83	1.	UGL		ND		ND	ND	
CHLOROBENZENE	31 JAN 83	1.	UGL						ND
1,2-DICHLOROETHANE	18 NOV 82	1.	UGL	4070.					
1,2-DICHLOROETHANE	11 JAN 83	1.	UGL			2.			
1,2-DICHLOROETHANE	25 JAN 83	1.	UGL		ND		28.	ND	
1,2-DICHLOROETHANE	31 JAN 83	1.	UGL						4.
1,1,1-TRICHLOROETHANE	18 NOV 82	1.	UGL	ND					
1,1,1-TRICHLOROETHANE	11 JAN 83	1.	UGL			3.			
1,1,1-TRICHLOROETHANE	25 JAN 83	1.	UGL		5.		6.	4.	
1,1,1-TRICHLOROETHANE	31 JAN 83	1.	UGL						29.
1,1-DICHLOROETHANE	18 NOV 82	1.	UGL	ND					
1,1-DICHLOROETHANE	11 JAN 83	1.	UGL			ND			
1,1-DICHLOROETHANE	25 JAN 83	1.	UGL		ND		ND	ND	
1,1-DICHLOROETHANE	31 JAN 83	1.	UGL						ND
1,1,2-TRICHLOROETHANE	18 NOV 82	1.	UGL	ND					
1,1,2-TRICHLOROETHANE	11 JAN 83	1.	UGL			ND			
1,1,2-TRICHLOROETHANE	25 JAN 83	1.	UGL		ND		341.	ND	
1,1,2-TRICHLOROETHANE	31 JAN 83	1.	UGL						ND
1,1,2,2-TETRACHLOROETHANE	18 NOV 82	1.	MGL	589.*					
1,1,2,2-TETRACHLOROETHANE	11 JAN 83	1.	UGL			ND			
1,1,2,2-TETRACHLOROETHANE	25 JAN 83	1.	UGL		ND		6000.	170.	
1,1,2,2-TETRACHLOROETHANE	31 JAN 83	1.	UGL						320.
CHLOROETHANE	18 NOV 82	2.	UGL	ND					
CHLOROETHANE	11 JAN 83	2.	UGL			ND			
CHLOROETHANE	25 JAN 83	2.	UGL		ND		ND	ND	
CHLOROETHANE	31 JAN 83	2.	UGL						ND
2-CHLOROETHYLVINYL ETHER	18 NOV 82	2.	UGL	ND					
2-CHLOROETHYLVINYL ETHER	11 JAN 83	2.	UGL			ND			
2-CHLOROETHYLVINYL ETHER	25 JAN 83	2.	UGL		ND		ND	ND	
2-CHLOROETHYLVINYL ETHER	31 JAN 83	2.	UGL						ND
CHLOROFORM	18 NOV 82	1.	UGL	ND					

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 1-2	1-10	1-11	1-12	1-13	1-14
CHLOROFORM	11 JAN 83	1.	UGL			7.			
CHLOROFORM	25 JAN 83	1.	UGL		ND		53.	ND	
CHLOROFORM	31 JAN 83	1.	UGL						7.
1,2-DICHLOROBENZENE	18 NOV 82	1.	UGL	ND					
1,2-DICHLOROBENZENE	11 JAN 83	1.	UGL			ND			
1,2-DICHLOROBENZENE	25 JAN 83	1.	UGL		ND		ND	ND	
1,2-DICHLOROBENZENE	31 JAN 83	1.	UGL						ND
1,3-DICHLOROBENZENE	18 NOV 82	1.	UGL	ND					
1,3-DICHLOROBENZENE	11 JAN 83	1.	UGL			ND			
1,3-DICHLOROBENZENE	25 JAN 83	1.	UGL		ND		ND	ND	
1,3-DICHLOROBENZENE	31 JAN 83	1.	UGL						ND
1,4-DICHLOROBENZENE	18 NOV 82	1.	UGL	ND					
1,4-DICHLOROBENZENE	11 JAN 83	1.	UGL			ND			
1,4-DICHLOROBENZENE	25 JAN 83	1.	UGL		ND		ND	ND	
1,4-DICHLOROBENZENE	31 JAN 83	1.	UGL						ND
1,1-DICHLOROETHYLENE	18 NOV 82	1.	UGL	ND					
1,1-DICHLOROETHYLENE	11 JAN 83	1.	UGL			ND			
1,1-DICHLOROETHYLENE	25 JAN 83	1.	UGL		ND		ND	ND	
1,1-DICHLOROETHYLENE	31 JAN 83	1.	UGL						ND
TRANS-1,2-DICHLOROETHYLENE	18 NOV 82	1.	UGL	2650.					
TRANS-1,2-DICHLOROETHYLENE	11 JAN 83	1.	UGL			4.			
TRANS-1,2-DICHLOROETHYLENE	25 JAN 83	1.	UGL		ND		24.	ND	
TRANS-1,2-DICHLOROETHYLENE	31 JAN 83	1.	UGL						3.
1,2-DICHLOROPROPANE	18 NOV 82	1.	UGL	ND					
1,2-DICHLOROPROPANE	11 JAN 83	1.	UGL			ND			
1,2-DICHLOROPROPANE	25 JAN 83	1.	UGL		ND		ND	ND	
1,2-DICHLOROPROPANE	31 JAN 83	1.	UGL						ND
1,3-DICHLOROPROPENE	18 NOV 82	1.	UGL	ND					
1,3-DICHLOROPROPENE	11 JAN 83	1.	UGL			ND			
1,3-DICHLOROPROPENE	25 JAN 83	1.	UGL		ND		ND	ND	
1,3-DICHLOROPROPENE	31 JAN 83	1.	UGL						ND
ETHYLBENZENE	18 NOV 82	1.	UGL	ND					
ETHYLBENZENE	11 JAN 83	1.	UGL			ND			
ETHYLBENZENE	25 JAN 83	1.	UGL		ND		ND	ND	
ETHYLBENZENE	31 JAN 83	1.	UGL						ND
METHYLENE CHLORIDE	18 NOV 82	1.	UGL	ND					
METHYLENE CHLORIDE	11 JAN 83	1.	UGL			9.			
METHYLENE CHLORIDE	25 JAN 83	1.	UGL		6.		5.	17.	
METHYLENE CHLORIDE	31 JAN 83	1.	UGL						7.
CHLOROMETHANE	18 NOV 82	2.	UGL	ND					
CHLOROMETHANE	11 JAN 83	2.	UGL			ND			

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 1-2	1-10	1-11	1-12	1-13	1-14
CHLOROMETHANE	25 JAN 83	2.	UGL		ND		ND	ND	
CHLOROMETHANE	31 JAN 83	2.	UGL						ND
BROMOMETHANE	18 NOV 82	2.	UGL	ND					
BROMOMETHANE	11 JAN 83	2.	UGL			ND			
BROMOMETHANE	25 JAN 83	2.	UGL		ND		ND	ND	
BROMOMETHANE	31 JAN 83	2.	UGL						ND
BROMOFORM	18 NOV 82	2.	UGL	ND					
BROMOFORM	11 JAN 83	2.	UGL			ND			
BROMOFORM	25 JAN 83	2.	UGL		ND		ND	ND	
BROMOFORM	31 JAN 83	2.	UGL						ND
BROMODICHLOROMETHANE	18 NOV 82	1.	UGL	ND					
BROMODICHLOROMETHANE	11 JAN 83	1.	UGL			ND			
BROMODICHLOROMETHANE	25 JAN 83	1.	UGL		ND		ND	ND	
BROMODICHLOROMETHANE	31 JAN 83	1.	UGL						ND
TRICHLOROFLUOROMETHANE	18 NOV 82	1.	UGL	ND					
TRICHLOROFLUOROMETHANE	11 JAN 83	1.	UGL			4.			
TRICHLOROFLUOROMETHANE	25 JAN 83	1.	UGL		ND		ND	ND	
TRICHLOROFLUOROMETHANE	31 JAN 83	1.	UGL						19.
DICHLOROFLUOROMETHANE	18 NOV 82	2.	UGL	ND					
DICHLOROFLUOROMETHANE	11 JAN 83	2.	UGL			ND			
DICHLOROFLUOROMETHANE	25 JAN 83	2.	UGL		ND		ND	ND	
DICHLOROFLUOROMETHANE	31 JAN 83	2.	UGL						ND
DIBROMOCHLOROMETHANE	18 NOV 82	1.	UGL	3040.					
DIBROMOCHLOROMETHANE	11 JAN 83	1.	UGL			ND			
DIBROMOCHLOROMETHANE	25 JAN 83	1.	UGL		ND		ND	ND	
DIBROMOCHLOROMETHANE	31 JAN 83	1.	UGL						ND
TETRACHLOROETHYLENE	18 NOV 82	1.	UGL	4200.					
TETRACHLOROETHYLENE	11 JAN 83	1.	UGL			30.			
TETRACHLOROETHYLENE	25 JAN 83	1.	UGL		1.		ND	ND	
TETRACHLOROETHYLENE	31 JAN 83	1.	UGL						ND
TOLUENE	18 NOV 82	1.	UGL	ND					
TOLUENE	11 JAN 83	1.	UGL			ND			
TOLUENE	25 JAN 83	1.	UGL		ND		ND	ND	
TOLUENE	31 JAN 83	1.	UGL						ND
TRICHLOROETHYLENE	18 NOV 82	1.	MGL	133.*					
TRICHLOROETHYLENE	11 JAN 83	1.	UGL			150.			
TRICHLOROETHYLENE	25 JAN 83	1.	UGL		8.		2300.	18.	
TRICHLOROETHYLENE	31 JAN 83	1.	UGL						92.
VINYL CHLORIDE	18 NOV 82	1.	UGL	ND					
VINYL CHLORIDE	11 JAN 83	1.	UGL			ND			
VINYL CHLORIDE	25 JAN 83	1.	UGL		ND		ND	ND	

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 1-2	1-10	1-11	1-12	1-13	1-14
VINYL CHLORIDE	31 JAN 83	1.	UGL						ND

* Value shown is in mg/L

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
WATER LEVELS (A)	04 OCT 82		FT	659.1	656.9	656.4	652.0	652.0
ARSENIC	05 OCT 82	.010	MGL	ND	ND	ND	ND	ND
BARIUM	05 OCT 82	.1	MGL	ND	ND	ND	ND	ND
CADMIUM	05 OCT 82	.005	MGL	ND	ND	ND	ND	ND
CHROMIUM	05 OCT 82	.010	MGL	ND	ND	ND	ND	ND
FLUORIDE	05 OCT 82	.10	MGL	.20	ND	.26	.19	ND
LEAD	05 OCT 82	.010	MGL	ND	ND	ND	ND	ND
MERCURY	05 OCT 82	.2	UGL	.2	.9	.7	1.1	.2
NO2+NO3 AS N	05 OCT 82	.05	MGL	.06	.11	.18	.14	.07
SELENIUM	05 OCT 82	.005	MGL	ND	ND	ND	ND	ND
SILVER	05 OCT 82	.01	MGL	ND	ND	ND	ND	ND
ENDRIN	05 OCT 82	.04	UGL	ND	ND	ND	ND	ND
LINDANE	05 OCT 82	.08	UGL	ND	ND	ND	ND	ND
TOXAPHENE	05 OCT 82	1.6	UGL	ND	ND	ND	ND	ND
METHOXYCHLOR	05 OCT 82	1.6	UGL	ND	ND	ND	ND	ND
2,4-D	05 OCT 82	3.8	UGL	ND	ND	ND	ND	ND
SILVEX	05 OCT 82	.5	UGL	ND	ND	ND	ND	ND
GROSS ALPHA	05 OCT 82	9.35	PCL	<6.10	<3.04	<6.33	<9.35	<8.05
RADIUM-226	21 AUG 82	.23	PCL	.34		.17	.33	ND
GROSS BETA	05 OCT 82	1.66	PCL	2.51	ND	ND	3.30	1.51
CHLORIDE	05 OCT 82	1.0	MGL	37.0	ND	22.0	95.0	110.0
IRON	05 OCT 82	.03	MGL	ND	ND	ND	ND	.12
MANGANESE	05 OCT 82	.01	MGL	1.78#	.29#	.50#	4.80#	.96#
PHENOL	05 OCT 82	.01	MGL	.01	.03	.01	.01	.03
SODIUM	05 OCT 82	1.	MGL	49.	10.	109.	144.	128.
SULFATE	05 OCT 82	5.0	MGL	270.0#	15.0	420.0#	800.0#	440.0#
PH(FIELD)	05 OCT 82		PH	6.4#	7.0	6.7	6.8	6.7
PH(FIELD)	05 OCT 82		PH	6.6	7.0	6.7	6.7	6.8
PH(FIELD)	05 OCT 82		PH	6.5	7.1	6.6	6.7	6.7
PH(FIELD)	05 OCT 82		PH	6.4#	7.1	6.9	6.7	6.7
SPEC COND	05 OCT 82	1.	UMC	1300.	500.	1480.	2200.	1700.
SPEC COND	05 OCT 82	1.	UMC	1300.	500.	1490.	2200.	1700.
SPEC COND	05 OCT 82	1.	UMC	1300.	500.	1490.	2200.	1700.
SPEC COND	05 OCT 82	1.	UMC	1300.	500.	1480.	2200.	1700.
TOC	05 OCT 82	1.0	MGL	6.0	34.0	58.0	72.0	65.0
TOC	05 OCT 82	1.0	MGL	6.0	33.0	58.0	75.0	64.0
TOC	05 OCT 82	1.0	MGL	6.0	34.0	59.0	76.0	65.0
TOC	05 OCT 82	1.0	MGL	6.0	34.0	60.0	75.0	62.0
TOX	05 OCT 82	.010	MGL	.014 C	ND	.010 C	.290 C	15.680 C
TOX	05 OCT 82	.010	MGL	ND	.010 C	.041 C	.430 C	12.760 C
TOX	05 OCT 82	.010	MGL	ND	.011 C	.070 C	.280 C	14.320 C
TOX	05 OCT 82	.010	MGL	.015 C	.011 C	.032 C	.580 C	18.640 C

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
GROSS ALPHA	30 NOV 81	4.08	PCL	ND	ND	ND	ND	4.59
GROSS ALPHA	23 MAR 82	10.10	PCL	<5.72	<3.22	<6.73	<10.10	<2.89
GROSS ALPHA	20 JUL 82	10.80	PCL	<5.63	<3.11	<6.54	<10.80	<6.41
GROSS ALPHA	05 OCT 82	9.35	PCL	<6.10	<3.04	<6.33	<9.35	<8.05
RADIUM-226	23 MAR 82	.05	PCL	.31		.19	.48	
RADIUM-226	20 JUL 82	.23	PCL	.34		.17	.33	ND
RADIUM-226	21 AUG 82	.23	PCL	.34		.17	.33	ND
GROSS BETA	30 NOV 81	1.30	PCL	3.17	2.07	3.36	6.27	3.03
GROSS BETA	23 MAR 82	1.55	PCL	2.13	4.49	2.88	4.16	ND
GROSS BETA	20 JUL 82	2.12	PCL	2.04	ND	1.55	3.91	ND
GROSS BETA	05 OCT 82	1.66	PCL	2.51	ND	ND	3.30	1.51

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

B UPGRADIENT SITE

C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE.

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-2	1-3	1-4	1-5	1-6
CARBON TETRACHLORIDE	05 OCT 82	1.	UGL	ND	34.	ND	ND	ND	ND
CHLOROBENZENE	05 OCT 82	1.	UGL	ND	6.	ND	ND	ND	ND
1,2-DICHLOROETHANE	05 OCT 82	1.	UGL	ND	2100.	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	05 OCT 82	1.	UGL	ND	36000.	20.	ND	58.	ND
CHLOROFORM	05 OCT 82	1.	UGL	ND	2000.	ND	ND	ND	ND
1,1-DICHLOROETHYLENE	05 OCT 82	1.	UGL	ND	65.	ND	ND	ND	ND
TRANS-1,2-DICHLOROETHYLENE	05 OCT 82	1.	UGL	ND	2300.	ND	ND	ND	ND
METHYLENE CHLORIDE	05 OCT 82	1.	UGL	8.	47.	ND	ND	ND	3.
BROMOFORM	05 OCT 82	2.	UGL	ND	8600.	ND	ND	ND	ND
TETRACHLOROETHYLENE	05 OCT 82	1.	UGL	ND	2700.	ND	ND	ND	ND
TRICHLOROETHYLENE	05 OCT 82	1.	UGL	ND	42000.	3.	ND	2900.	ND

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE.

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 1-7	1-8	1-9
METHYLENE CHLORIDE	18 NOV 82	1.	UGL	40.	2.	5.
TRICHLOROETHYLENE	18 NOV 82	1.	UGL	3.	1.	5.

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE.

LEGEND

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B UPGRADIENT SITE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
WATER								
LEVELS (A)	19 JUL 82		FT	659.1	500.1	656.4	653.4	653.0
ARSENIC	20 JUL 82	.010	MGL	ND	ND	ND	ND	ND
BARIUM	20 JUL 82	.1	MGL	ND	ND	ND	ND	ND
CADMIUM	20 JUL 82	.005	MGL	ND	ND	ND	ND	ND
CHROMIUM	20 JUL 82	.010	MGL	ND	ND	ND	ND	ND
FLUORIDE	20 JUL 82	.10	MGL	.20	.10	.26	.19	.10
LEAD	20 JUL 82	.010	MGL	ND	ND	ND	ND	ND
MERCURY	20 JUL 82	.2	UGL	ND	ND	ND	ND	ND
NO2+NO3 AS N	20 JUL 82	.05	MGL	ND	.06	ND	.16	.05
SELENIUM	20 JUL 82	.005	MGL	ND	ND	ND	ND	ND
SILVER	20 JUL 82	.01	MGL	ND	ND	ND	ND	ND
ENDRIN	20 JUL 82	.04	UGL	ND	ND	ND	ND	ND
LINDANE	20 JUL 82	.08	UGL	ND	ND	ND	ND	ND
TOXAPHENE	20 JUL 82	1.6	UGL	ND	ND	ND	ND	ND
METHOXYCHLOR	20 JUL 82	1.6	UGL	ND	ND	ND	ND	ND
2,4-D	20 JUL 82	3.8	UGL	ND	ND	ND	ND	ND
SILVEX	20 JUL 82	.5	UGL	ND	ND	ND	ND	ND
GROSS ALPHA	20 JUL 82	10.80	PCL	<5.63	<3.11	<6.54	<10.80	<6.41
GROSS BETA	20 JUL 82	2.12	PCL	2.04	ND	1.55	3.91	ND
CHLORIDE	20 JUL 82	1.0	MGL	46.0	7.0	30.0	90.0	95.0
IRON	20 JUL 82	.03	MGL	ND	.71#	.12	.12	.19
MANGANESE	20 JUL 82	.01	MGL	2.15#	ND	.15#	2.82#	.40#
PHENOL	20 JUL 82	.01	MGL	.03	.05	.02	.05	.17
SODIUM	20 JUL 82	1.	MGL	53.	13.	130.	208.	126.
SULFATE	20 JUL 82	5.0	MGL	310.0#	31.0	510.0#	680.0#	330.0#
PH(FIELD)	20 JUL 82		PH	6.5	6.7	6.8	6.7	6.6
PH(FIELD)	20 JUL 82		PH	6.5	6.7	6.8	6.7	6.6
PH(FIELD)	20 JUL 82		PH	6.5	6.7	6.7	6.6	6.6
PH(FIELD)	20 JUL 82		PH	6.5	6.7	6.8	6.7	6.6
SPEC COND	20 JUL 82	1.	UMO	1160.	465.	1350.	2380.	1420.
SPEC COND	20 JUL 82	1.	UMO	1160.	460.	1350.	2370.	1430.
SPEC COND	20 JUL 82	1.	UMO	1150.	460.	1340.	2350.	1430.
SPEC COND	20 JUL 82	1.	UMO	1160.	465.	1340.	2380.	1420.
TOC	20 JUL 82	1.0	MGL	62.0	38.0	48.0	66.0	61.0
TOC	20 JUL 82	1.0	MGL	61.0	38.0	48.0	66.0	62.0
TOC	20 JUL 82	1.0	MGL	61.0	38.0	47.0	66.0	61.0
TOC	20 JUL 82	1.0	MGL	61.0	38.0	48.0	65.0	62.0
TOX	20 JUL 82	.010	MGL	.043 C	.040 C	.017 C	1.600 C	104.000 C
TOX	20 JUL 82	.010	MGL	ND	.064 C	ND	1.600 C	102.000 C
TOX	20 JUL 82	.010	MGL	.040 C	.088 C	.019 C	1.600 C	102.000 C
TOX	20 JUL 82	.010	MGL	.047 C	.040 C	.034 C	1.600 C	103.000 C

021

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
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CU - COLOR UNITS
PNM - PER 100 MILLILITERS

CRANE NWSC
Radiochemistry Results

Well	Date	Gross Alpha	Gross Beta	Radium-226	Radium-228	Strontium-90	Uranium
1-1	5 Oct 82			<0.21			
1-4	5 Oct 82			0.25			

CRANE NWSC

Results of Analysis for Purgeable Organic Priority Pollutants

Samples Taken 20 Apr 83

Results in ug/L

	1-7	1-15	1-16	1-17	BBP	BAP
trans-1,2-Dichloroethylene	ND	*	10	ND	ND	ND
Chloroform	ND	8	16	2	180	83
Trichloroethylene	ND	145	1400	58	ND	ND
Bromoform	ND	ND	42	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	1450	6500	ND	ND	ND
Benzene	ND	ND	8	ND	ND	ND
1,1,2,2-Tetrachloroethylene	ND	*	ND	6	ND	ND
Bromodichloromethane	ND	ND	ND	ND	12	**

ND - Compound not detected

Analysis by Gas Chromotography; results for samples 1-15, 1-16, 1-17, BBP, and BAP confirmed by Mass Spectrometry.

* - Compound present at low, but unquantified, level.

** - trace level present.

Ch-2(12

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN

FACILITY: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
WATER LEVELS (A)	23 MAR 82		FT	659.1	662.9	656.9	653.7	655.8
ARSENIC	23 MAR 82	.010	MGL	ND	ND	ND	ND	ND
BARIUM	23 MAR 82	.1	MGL	ND	ND	ND	ND	ND
CADMIUM	23 MAR 82	.005	MGL	ND	ND	ND	ND	ND
CHROMIUM	23 MAR 82	.010	MGL	ND	ND	ND	ND	ND
FLUORIDE	23 MAR 82	.10	MGL	.21	ND	.19	.15	ND
LEAD	23 MAR 82	.010	MGL	ND	ND	ND	ND	ND
MERCURY	23 MAR 82	.2	UGL	ND	ND	ND	ND	ND
NO2+NO3 AS N	23 MAR 82	.05	MGL	ND	.13	ND	.12	.16
SELENIUM	23 MAR 82	.005	MGL	ND	ND	ND	ND	ND
SILVER	23 MAR 82	.01	MGL	ND	.01	ND	ND	ND
ENDRIN	23 MAR 82	.04	UGL	ND	ND	ND	ND	ND
LINDANE	23 MAR 82	.08	UGL	ND	ND	ND	ND	ND
TOXAPHENE	23 MAR 82	1.6	UGL	ND	ND	ND	ND	ND
METHOXYCHLOR	23 MAR 82	1.6	UGL	ND	ND	ND	ND	ND
2,4-D	23 MAR 82	3.8	UGL	ND	ND	ND	ND	ND
SILVEX	23 MAR 82	.5	UGL	ND	ND	ND	ND	ND
GROSS ALPHA	23 MAR 82	10.10	PCL	<5.72	<3.22	<6.73	<10.10	<2.89
RADIUM-226	23 MAR 82	.05	PCL	.31		.19	.48	
GROSS BETA	23 MAR 82	1.55	PCL	2.13	4.49	2.88	4.16	ND
CHLORIDE	23 MAR 82	1.0	MGL	40.4	7.0	62.4	82.9	29.9
IRON	23 MAR 82	.03	MGL	.07	.10	.08	.09	.03
MANGANESE	23 MAR 82	.01	MGL	2.06#	ND	7.00#	6.40#	.03
PHENOL	23 MAR 82	.01	MGL	ND	ND	ND	ND	ND
SODIUM	23 MAR 82	1.	MGL	55.	17.	80.	210.	35.
SULFATE	23 MAR 82	5.0	MGL	340.0#	29.8	460.0#	760.0#	44.0
PH(FIELD)	23 MAR 82		PH	6.4#	6.4#	6.4#	6.4#	6.1#
PH(FIELD)	23 MAR 82		PH	6.4#	6.4#	6.3#	6.6	6.2#
PH(FIELD)	23 MAR 82		PH	6.3#	6.4#	6.5	6.6	6.1#
PH(FIELD)	23 MAR 82		PH	6.4#	6.4#	6.4#	6.6	6.1#
SPEC COND	23 MAR 82	1.	UMC	1220.	422.	1500.	2250.	420.
SPEC COND	23 MAR 82	1.	UMC	1215.	420.	1500.	2250.	420.
SPEC COND	23 MAR 82	1.	UMC	1210.	421.	1500.	2250.	420.
SPEC COND	23 MAR 82	1.	UMC	1205.	422.	1500.	2250.	420.
TOC	23 MAR 82	1.0	MGL	5.0	2.0	11.0	6.0	3.0
TOC	23 MAR 82	1.0	MGL	7.0	3.0	12.0	6.0	3.0
TOC	23 MAR 82	1.0	MGL	7.0	2.0	11.0	7.0	3.0
TOC	23 MAR 82	1.0	MGL	5.0	3.0	11.0	6.0	3.0
TOX	23 MAR 82	.010	MGL	.016 C	.014 C	.018 C	.088 C	8.900 C
TOX	23 MAR 82	.010	MGL	.010 C	.029 C	.012 C	.220 C	9.600 C
TOX	23 MAR 82	.010	MGL	.012 C	.015 C	.012 C	.094 C	8.680 C
TOX	23 MAR 82	.010	MGL	.011 C	.017 C	.051 C	.100 C	7.620 C

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN FACILITY: MUSTARD GAS BURIAL SITE

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

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MGL - MILLIGRAMS/LITER
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TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
WATER LEVELS A	13 DEC 81		FT	658.74	654.93	653.95	642.69	646.04
ARSENIC	30 NOV 81	.010	MGL	ND	ND	ND	ND	ND
BARIUM	30 NOV 81	.1	MGL	ND	ND	ND	ND	ND
CADMIUM	30 NOV 81	.005	MGL	ND	ND	ND	ND	ND
CHROMIUM	30 NOV 81	.010	MGL	ND	ND	ND	ND	ND
FLUORIDE	30 NOV 81	.10	MGL	.20	.11	.24	.17	.12
LEAD	30 NOV 81	.010	MGL	ND	ND	ND	ND	ND
MERCURY	30 NOV 81	.2	UGL	ND	ND	ND	ND	ND
NO2+NO3 AS N	30 NOV 81	.05	MGL	.06	.17	.06	ND	.08
SELENIUM	30 NOV 81	.005	MGL	ND	ND	ND	ND	ND
SILVER	30 NOV 81	.01	MGL	ND	ND	ND	ND	ND
ENDRIN	30 NOV 81	.04	UGL	ND	ND	ND	ND	ND
LINDANE	30 NOV 81	.08	UGL	ND	ND	ND	ND	ND
TOXAPHENE	30 NOV 81	1.6	UGL	ND	ND	ND	ND	ND
METHOXYCHLOR	30 NOV 81	1.6	UGL	ND	ND	ND	ND	ND
2,4-D	30 NOV 81	3.8	UGL	ND	ND	ND	ND	ND
SILVER	30 NOV 81	.5	UGL	ND	ND	ND	ND	ND
GROSS ALPHA	30 NOV 81	4.08	PCL	ND	ND	ND	ND	4.59
GROSS BETA	30 NOV 81	1.30	PCL	3.17	2.07	3.36	6.27	3.03
TOTCOLBACT	01 DEC 81	1.	PHM	ND		9.*		
TOTCOLBACT	02 DEC 81	1.	PHM		5.*		2.*	ND
CHLORIDE	30 NOV 81	1.0	MGL	43.1	4.5	28.6	98.9	13.7
IRON	30 NOV 81	.03	MGL	.12	.65*	ND	.20	.50*
MANGANESE	30 NOV 81	.01	MGL	2.15*	.03	6.20*	5.70*	.17*
PHENOL	30 NOV 81	.01	MGL	ND	ND	ND	.01	.01
SODIUM	30 NOV 81	1.	MGL	56.	16.	90.	136.	180.
SULFATE	30 NOV 81	5.0	MGL	331.0*	36.5	372.0*	711.0*	544.0*
PH(FIELD)	30 NOV 81		PH	6.6	7.3	6.8	7.1	7.4
PH(FIELD)	30 NOV 81		PH	6.7	7.3	6.9	7.2	7.4
PH(FIELD)	30 NOV 81		PH	6.6	7.2	6.8	7.1	7.4
PH(FIELD)	30 NOV 81		PH	6.7	7.3	6.9	7.0	7.4
SPEC COND	30 NOV 81	1.	UMC	1300.	540.	1300.	2100.	1930.
SPEC COND	30 NOV 81	1.	UMC	1290.	540.	1300.	2120.	1910.
SPEC COND	30 NOV 81	1.	UMC	1290.	540.	1310.	2100.	1920.
SPEC COND	30 NOV 81	1.	UMC	1290.	530.	1310.	2110.	1920.
TOC	30 NOV 81	1.0	MGL	10.9	3.6	10.6	12.7	19.4
TOC	30 NOV 81	1.0	MGL	9.7	3.5	10.6	12.9	17.8
TOC	30 NOV 81	1.0	MGL	10.4	3.5	10.3	12.8	16.2
TOC	30 NOV 81	1.0	MGL	10.0	3.4	10.4	12.8	18.4

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: MUSTARD GAS BURIAL SITE

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 1-1	1-3	1-4	1-5	1-2
TOX	30 NOV 81	10.	UGL	14.C	47.C	102.C	32.C	118.C D
TOX	30 NOV 81	10.	UGL	23.C	65.C	93.C	49.C	103.C
TOX	30 NOV 81	10.	UGL	ND	38.C	90.C	52.C	126.C
TOX	30 NOV 81	10.	UGL	ND	51.C	119.C	61.C	138.C

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES; TRAILING ZEROES DO NOT ALWAYS INDICATE SIGNIFICANCE, BUT ARE THE RESULTS OF COMPUTER FORMATTING.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

C RESULTS ARE FOR UNFILTERED SAMPLE

D TOX results for well 1-2 are milligrams per liter

SITE 3

TABEL I. CRANE NAVAL WEAPONS SUPPORT CENTER
MARCH 1985
GROUNDWATER SAMPLING. AREA 3-RCRA

ATEC Lab No.	1347-85	1348-85
Well No.	3-28	3-29
Date Samples	3/26/85	3/26/85
TOC, mg/l (Average)	1.0	3.6
TOX, ug/l (Average)	<5	68.4
Chloride, mg/l	2	6
Iron, ug/l	210	60
Manganese, ug/l	20	20
Phenols, ug/l	<50	<50
Sodium, mg/l	6.4	14
Sulfate, mg/l	30	94
Arsenic, ug/l	<4	<4
Barium, ug/l	<50	<50
Cadmium, ug/l	<0.4	<0.4
Chromium, ug/l	<20	<20
Lead, ug/l	<5	<5
Mercury, ug/l	<0.3	<0.3
Selenium, ug/l	<4	<4
Silver, ug/l	<10	<10
Nitrate N, mg/l	0.53	0.28
Fluoride, mg/l	<0.10	0.21
Gross Alpha, pCu/l	<3	<3
Gross Beta, pCu/l	<4	<4
Radium, pCu/l	<5	<5
Endrin, ug/l	<0.02	<0.02
Lindane, ug/l	<0.01	<0.01
Methoxychlor, ug/l	<0.05	<0.05
Toxaphene, ug/l	<0.10	<0.10
2, 4 - D, ug/l	<0.02	<0.02
2, 4, 5 - TP Silvex, ug/l	<0.01	<0.01
PH, FIELD	7.3	7.0
	7.3	7.1
	7.3	7.0
	7.3	7.0

FAILED TO TAKE SAMPLES FOR SPECIFIC CONDUCTANCE

TABLE II. STATISTICAL ANALYSES. AREA 3-RCRA
BACKGROUND CAMPARISON DATA

	Total Organic Halogen (mg/l)	Total Organic Carbon (mg/l)
# Points	16	16
Mean	0.018	27
Std. Dev.	0.01385	25.69
Variance	0.000192	660.22

TABLE III. STATISTICAL ANALYSES. AREA 3-RCRA
SAMPLES COLLECTED 3/26/85

	Well # 3-28 Total Organic Halogen (mg/l)	Total Organic Carbon (mg/l)
	<0.0050	1.2
	<0.0050	1.0
	<0.0050	1.0
	<0.0050	0.9
# Points	4	4
Mean	<0.0050	1.0
Std. Dev.	0	0.126
Variance	0	0.0158
t	-5.20	-4.05
Significant Increase?	N	N

TABLE IV. STATISTICAL ANALYSES. AREA 3-RCRA
SAMPLES COLLECTED 3/26/85

	Well # 3-29 Total Organic Halogen (mg/l)	Total Organic Carbon (mg/l)
	0.0696	3.8
	0.0706	3.7
	0.0657	3.5
	0.0677	3.2
# Points	4	4
Mean	0.0684	3.6
Std. Dev.	0.00216	0.265
Variance	0.00000469	0.070
t	13.89	-3.64
tc	2.77	--
Significant Increase ?	Y	N

Table V. Crane Naval Weapons Support Center. January 1985. Groundwater Sampling Project. Area 3-CERCLA- Inorganic

ATEC Lab No.	286-85	288-85	289-85
Well No.	3-7	3-10	3-11
Date Sampled	1/15/85	1/15/85	1/15/85
pH, Lab, S.U.	7.3	7.6	7.5
Cond., Field, umho	4200	950	730
Chloride, mg/l	14	<1	<1
Iron, ug/l	160	<20	130
Manganese, ug/l	8000	30	800
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	5.6	3.9	2.8
Sulfate, mg/l	3100	170	41
TOC, mg/l	11	2.0	3.5
TOX, ug/l	7600	9.3	12
Cond., Lab, umho	3300	600	560

ATEC Lab No.	290-85	291-85	292-85
Well No.	3-12	3-13	3-14
Date Sampled	1/15/85	1/15/85	1/15/85
pH, Lab, S.U.	7.3	7.7	7.8
Cond., Field, umho	500	500	620
Chloride, mg/l	<1	<1	<1
Iron, ug/l	30	60	250
Manganese, ug/l	70	340	1350
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	8.5	6.3	3.5
Sulfate, mg/l	69	20	20
TOC, mg/l	2.6	2.3	9.6
TOX, ug/l	16	<5.0	23
Cond., Lab, umho	420	385	450

Table V. Crane Naval Weapons Support Center. January 1985. Groundwater Sampling Project. Area 3-CERCLA - Inorganic

ATEC Lab No.	293-85	294-85	295-85
Well No.	3-15	3-16	3-17
Date Sampled	1/15/85	1/15/85	1/15/85
pH, Lab, S.U.	7.3	7.6	7.9
Cond., Field, umho	740	380	430
Chloride, mg/l	<1	<1	<1
Iron, ug/l	100	50	90
Manganese, ug/l	180	40	40
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	3.9	4.7	3.4
Sulfate, mg/l	100	13	13
TOC, mg/l	2.0	2.6	1.3
TOX, ug/l	34	9.3	5.5
Cond., Lab, umho	595	335	320

ATEC Lab No.	296-85	297-85	298-85
Well No.	3-18	3-19	3-20
Date Sampled	1/15/85	1/15/85	1/15/85
pH, Lab, S.U.	11.0	7.8	7.7
Cond., Field, umho	370	520	360
Chloride, mg/l	1	<1	<1
Iron, ug/l	40	20	360
Manganese, ug/l	50	30	100
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	3.2	6.6	7.1
Sulfate, mg/l	13	94	41
TOC, mg/l	5.0	2.9	4.1
TOX, ug/l	8.3	5.9	5.1
Cond., Lab, umho	240	325	280

Table V. (Cont'd.) Crane Naval Weapons Support Center. January 1985. Groundwater Sampling Project. Area 3-CERCLA - Inorganic

ATEC Lab No.	299-85	300-85	301-85
Well No.	3-21	3-22	3-23
Date Sampled	1/15/85	1/15/85	1/15/85
pH, Lab, S.U.	7.4	7.6	7.6
Cond., Field, umho	580	1030	540
Chloride, mg/l	<1	<1	<1
Iron, ug/l	50	150	80
Manganese, ug/l	80	150	60
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	4.5	5.0	5.3
Sulfate, mg/l	13	130	13
TOC, mg/l	5.6	4.1	6.2
TOX, ug/l	8.5	19	<5.0
Cond., Lab, umho	510	770	415

ATEC Lab No.	302-85	303-85
Well No.	3-24	3-25
Date Sampled	1/15/85	1/15/85
pH, Lab, S.U.	7.6	7.8
Cond., Field, umho	580	190
Chloride, mg/l	<1	<1
Iron, ug/l	100	60
Manganese, ug/l	40	50
Phenols, ug/l	<50	<50
Sodium, mg/l	10	1.9
Sulfate, mg/l	160	13
TOC, mg/l	5.0	2.7
TOX, ug/l	7.3	<5.0
Cond., Lab, umho	560	165

Table VI. Crane Naval Weapons Support Center. January 1985
Groundwater Sampling Project. Area 3-CERCLA - Organic

ATEC Lab No.	286-85	290-85	293-85
Well No.	3-7	3-12	3-15
Date Sampled	1/15/85	1/15/85	1/15/85
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 1.0	< 1.0	< 1.0
Chloroethane	< 10	< 10	< 10
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	< 1.0	< 1.0	< 1.0
Dichlorobromomethane	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane	< 10	< 10	< 10
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	< 1.0	< 1.0	< 1.0
Methyl Bromide	< 10	< 10	< 10
Methyl Chloride	< 10	< 10	< 10
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	427	< 1.0	< 1.0
Tetrachloroethene	34	< 1.0	< 1.0
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	1310	< 1.0	22.6
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	120	< 1.0	< 1.0
Trichloroethene	2450	2.6	14
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 10	< 10	< 10

All concentrations expressed as *ug*/l.

Original Copy in Sample results Book

ANALYTICAL INFORMATION
NAVWPNSUPPCEN, CRANE SAMPLES

LABORATORY Aqua Tech

ADDRESS 181 S. Main Street, Marion, OH 43302

LABORATORY CONTACT J. A. Smith

PHONE 614-382-5991

DATE SAMPLES RECEIVED 11/8/84 Cont. NUMBER OF SAMPLES

RECEIVED BY M. Blank

ANALYSIS PERFORMED	ANALYTICAL METHOD	DATES OF ANALYSES	NAME(S) OF ANALYST(S)	RE m
11074 ABG ~~10~~ 3-12-83 TNT	HPLC	11/13/84	R. Glowacky	0.
HMX	"	"	"	0.
RDX	"	"	"	0.
11074 ABG ~~10~~ 3-17-83 TNT	"	"	"	<0.
HMX	"	"	"	<0.
RDX	"	"	"	0.
11074				

...NSUPPCEN, Crane, IN.

Signature of Laboratory Representative Jeffrey A. Smith

(Type/print name underneath signature block) Jeffrey A. Smith

DATE December 10, 1984

Original Copy in Sample results Book

ANALYTICAL INFORMATION
NAVWPNSUPPCEN, CRANE SAMPLES

LABORATORY Aqua Tech

ADDRESS 181 S. Main Street, Marion, OH 43302

LABORATORY CONTACT J. A. Smith

PHONE 614-382-5991

DATE SAMPLES RECEIVED 11/8/84 NUMBER OF SAMPLES 11

RECEIVED BY M. Blank

ANALYSIS PERFORMED	ANALYTICAL METHOD	DATES OF ANALYSES	NAME(S) OF ANALYST(S)	RESU mg/
11074 ABG ~~10~~ 3-24-83 TNT	HPLC	11/13/84	"	<0.0(
HMX	"	"	"	<0.0!
RDX	"	"	"	<0.0!
11074 ABG ~~10~~ 3-15-83 TNT	"	"	"	<0.0(
HMX	"	"	"	<0.0!
RDX	"	"	"	0.04

I certify that quality control measures were incorporated for these samples in accordance with the Quality Control Plan submitted to a NAVWPNSUPPCEN, Crane, IN.

Signature of Laboratory Representative Jeffrey A. Smith

(Type/print name underneath signature block) Jeffrey A. Smith

DATE December 10, 1984

Commander
Naval Weapons Support Center
Crane, Indiana 47522

Attn: Ms. Cathy Andrews

Date: October 19, 1984

Project Number: 7781

Results reported in µg/l

ERG-Cleve Sample ID	Crane Sample ID	Parameter	Results
27,761	W3-1-05094	HMX	ND-10
		RDX	38
		TNT	ND-10

ND-non-detectable. Detection limits are shown next to "ND" notations.

Commander
Naval Weapons Support Center
Crane, Indiana 47522

Attn: Ms. Cathy Andrews

Date: September 18, 1984

Project Number: 7683

Results reported in mg/l
except where noted.

ERG-Cleve Sample ID	Crane Sample ID	Total Organic Carbon	TOTAL ORGANIC HALOGENS Chloride	Bromide	Iodine	Specific Conductance
26,419A	ABG-3-4	10	-------	--------	--------	--------
B		9	-------	--------	--------	--------
C		9	-------	--------	--------	--------
D		8	-------	--------	--------	--------

ND-non-detectable. Detection limits are shown next to "ND" notations.

DEPARTMENT OF THE NAVY
NAVAL WEAPONS SUPPORT CENTER
CRANE, INDIANA 47522

IN REPLY REFER TO:

3025-WKE:wke
8000/1
21 Aug 1984

MEMORANDUM

From: 3025
To: 0924 (J. Belcher)

Subj: Qualitative analysis of ground water samples for Total Organic Carbon

1. Three samples were received on 8 August 1984 for Total Organic Carbon analysis. Evaluation was performed in quadruplets on a Dohrmann's DC-80 Organic Carbon Analyzer using the standard sparge technique found in the system's manual. The samples were filtered using a 0.45 micron millipore filter, acidified and sparged to remove carbonates and biocarbonates. The "non-purgeable" organic carbon was reported as Total Organic Carbon.

2. Results were as follows:

		Total Organic Carbon (PPM)			
Sample	Description	#1	#2	#3	#4
#1	ABG-3-4	8.778	8.747	8.722	8.622

Note: Error limitations are equal to plus or minus 2.0 % of measurement.

3. Further correspondence should reference Explosive Sciences Branch Number N84-0252. Any additional information may be obtained by contacting Explosive Sciences Branch (3025, B. Emily) at extension 1252.

R. E. KLAUSMEIER

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.
7777 EXCHANGE STREET
CLEVELAND, OHIO 44125 (216) 447-0790

PROJECT V7479
REPORT DATE 07-24-84

CLIENT P.O.: CLEVELAND
REPORT: 8320

SAMPLES RECVD: 06-18-84
REFER TECHNICAL QUESTIONS
TO: JOHN WILSON

CLIENT:
COMMANDER
CRANE N.W.S.C.
CODE 0924 CATHY ANDREWS
CRANE, INDIANA 47522

ATTENTION: CATHY ANDREWS

APPROVED: _____

***
RESIDUAL SAMPLES WILL
BE HELD FOR TWO WEEKS
***

CLIENT I.D.: SMART REPORT
ERG SAMPLE NO: 06/110397
MATRIX: SPECIAL REPORTS
DATE COLLECTED: NG

PARAMETER	RESULTS	UNITS

CLIENT I.D.: ABG 3-1 (A)
ERG SAMPLE NO: 06/110398
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.012	mg/L
CONDUCTANCE, SPECIFIC	840	umho/cm
pH, FIELD,	7.0	S.U.
RDX (BY HPLC)	33	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG 3-1 (B)
ERG SAMPLE NO: 06/110399
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: ABG 3-1 (B)
ERG SAMPLE NO: 06/110399
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.014	mg/L
CONDUCTANCE, SPECIFIC	840	umho/c
pH, FIELD,	6.9	S.U.

CLIENT I.D.: ABG 3-1 (C)
ERG SAMPLE NO: 06/110400
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.009	mg/L
CONDUCTANCE, SPECIFIC	860	umho/cr
pH, FIELD,	7.0	S.U.

CLIENT I.D.: ABG 3-1 (D)
ERG SAMPLE NO: 06/110401
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	4	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.011	mg/L
CONDUCTANCE, SPECIFIC	840	umho/cm
pH, FIELD,	7.0	S.U.

CLIENT I.D.: ABG 3-2 (A)
ERG SAMPLE NO: 06/110402
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: ABG 3-2 (A)
ERG SAMPLE NO: 06/110402
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	610	umho/cm
pH, FIELD,	7.9	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG 3-2 (B)
ERG SAMPLE NO: 06/110403
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	650	umho/cm
pH, FIELD,	7.9	S.U.

CLIENT I.D.: ABG 3-2 (C)
ERG SAMPLE NO: 06/110404
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.04	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CONDUCTANCE, SPECIFIC	650	umho/cm
pH, FIELD,	7.9	S.U.

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: ABG 3-2 (D)
ERG SAMPLE NO: 06/110405
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.06	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CONDUCTANCE, SPECIFIC	670	umho/c
pH, FIELD,	7.9	S.U.

CLIENT I.D.: ABG 3-4 (A)
ERG SAMPLE NO: 06/110406
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.007	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/c
pH, FIELD,	7.9	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG 3-4 (B)
ERG SAMPLE NO: 06/110407
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.04	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.007	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/cm
pH, FIELD,	8.0	S.U.

SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

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ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: ABG 3-4 (C)
ERG SAMPLE NO: 06/110408
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.006	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/cm
pH, FIELD,	8.0	S.U.

CLIENT I.D.: ABG 3-4 (D)
ERG SAMPLE NO: 06/110409
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.005	mg/L
CONDUCTANCE, SPECIFIC	1300	umho/cm
pH, FIELD,	7.9	S.U.

CLIENT I.D.: ABG 3-5 (A)
ERG SAMPLE NO: 06/110410
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.04	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CONDUCTANCE, SPECIFIC	710	umho/cm
pH, FIELD,	7.2	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (0.10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

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 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: ABG 3-5 (B)
ERG SAMPLE NO: 06/110411
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CONDUCTANCE, SPECIFIC	740	umho/cm
pH, FIELD,	7.2	S.U.

CLIENT I.D.: ABG 3-5 (C)
ERG SAMPLE NO: 06/110412
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	4	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	760	umho/cm
pH, FIELD,	7.2	S.U.

CLIENT I.D.: ABG 3-5 (D)
ERG SAMPLE NO: 06/110413
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	4	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	740	umho/cm
pH, FIELD,	7.2	S.U.

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ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: ABG 3-6 (A)
ERG SAMPLE NO: 06/110414
MATRIX: GROUND WATER
DATE COLLECTED: 06-09-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	290	umho/cm
pH, FIELD,	7.7	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG 3-6 (B)
ERG SAMPLE NO: 06/110415
MATRIX: GROUND WATER
DATE COLLECTED: 06-09-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	290	umho/cm
pH, FIELD,	7.8	S.U.

CLIENT I.D.: ABG 3-6 (C)
ERG SAMPLE NO: 06/110416
MATRIX: GROUND WATER
DATE COLLECTED: 06-09-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	290	umho/cm
pH, FIELD,	7.8	S.U.

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ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: ABG 3-6 (D)
ERG SAMPLE NO: 06/110417
MATRIX: GROUND WATER
DATE COLLECTED: 06-09-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	290	umho/cm
pH, FIELD,	7.8	S.U.

CARBON, TOTAL ORGANIC,	6	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	3.6	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.15	mg/L
CONDUCTANCE, SPECIFIC	6300	umho/cm
pH, FIELD,	7.3	S.U.

CLIENT I.D.: ABG 3-8 (A)
ERG SAMPLE NO: 06/110422
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	9	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.04	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	430	umho/cm
pH, FIELD,	7.7	S.U.
RDX (BY HPLC)	5.6	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

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 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: ABG 3-8 (B)
ERG SAMPLE NO: 06/110423
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	9	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.005	mg/L
CONDUCTANCE, SPECIFIC	430	umho/cm
pH, FIELD,	7.7	S.U.

CLIENT I.D.: ABG 3-8 (C)
ERG SAMPLE NO: 06/110424
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	8	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	420	umho/cm
pH, FIELD,	7.7	S.U.

CLIENT I.D.: ABG 3-8 (D)
ERG SAMPLE NO: 06/110425
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	10	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	430	umho/cm
pH, FIELD,	7.7	S.U.

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ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: ABG 3-9 (A)
ERG SAMPLE NO: 06/110426
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CONDUCTANCE, SPECIFIC	1300	umho/cm
pH, FIELD,	7.4	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG 3-9 (B)
ERG SAMPLE NO: 06/110427
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	1200	umho/cm
pH, FIELD,	7.4	S.U.

CLIENT I.D.: ABG 3-9 (C)
ERG SAMPLE NO: 06/110428
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	1200	umho/cm
pH, FIELD,	7.4	S.U.

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 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: ABG 3-9 (D)
ERG SAMPLE NO: 06/110429
MATRIX: GROUND WATER
DATE COLLECTED: 06-10-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	1300	umho/cm
pH, FIELD,	7.4	S.U.

Environmental Research Group, Inc.
117 N. FIRST ST. ANN ARBOR, MI 48104 (313) 662-3104

Summary Well Monitoring Report

Prepared for:
OFFICER IN CHARGE OF CONSTRUCTION
CRANE N. W. S. C.
CODE 0924 CATHY ANDREWS
CRANE, INDIANA 47522

Site : AMMUNITION BURNING GROUNDS
Well : Upgradient Well Data
EPA ID :

Baseline Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
11-17-81	.015	17.1	6.9	750
11-17-81	.025	16.5	6.9	760
11-17-81	.019	17.7	6.9	770
11-17-81	.022	17.5	6.8	770
3-18-82	.026	3.0	6.6	732
3-18-82	.017	3.0	6.6	730
3-18-82	.030	3.0	6.6	735
3-18-82	.024	3.0	6.6	734
6-28-82	ND(0.010)	69.0	6.6	848
6-28-82	ND(0.010)	69.0	6.5	845
6-28-82	0.013	69.0	6.4	845
6-28-82	ND(0.010)	67.0	6.6	846
9-20-82	.053	18.0	6.6	760
9-20-82	.016	18.0	6.5	760
9-20-82	ND(0.010)	18.0	6.7	760
9-20-82	.021	18.0	6.6	760
11-17-81	.053	38.4	8.1	1800
11-17-81	.055	36.5	8.2	1800
11-17-81	.057	37.3	8.2	1800
11-17-81	.060	35.5	8.1	1790
3-15-82	.064	2.0	6.5	226
3-15-82	.059	2.0	6.5	225
3-18-82	.050	2.0	6.5	224
3-18-82	.063	2.0	6.5	225
6-28-82	.037	49.0	6.9	1200
6-28-82	.029	49.0	6.9	1180
6-28-82	.029	51.0	6.8	1190
6-28-82	.034	51.0	6.8	1180
9-20-82	ND(0.010)	40.0	7.2	1060
9-20-82	ND(0.010)	35.0	7.0	1060
9-20-82	.017	39.0	7.1	1060
9-20-82	ND(0.010)	35.0	7.1	1060
11-30-81	.032	23.5	7.4	1210
11-30-81	.088	23.6	7.4	1210
11-30-81	.079	23.1	7.4	1210

Enclosure (3)

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : Upgradient Well Data
EPA ID :

Baseline Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
3-15-82	.022	11.0	6.7	1280
3-15-82	.042	11.0	6.1	1279
3-15-82	.011	11.0	6.6	1279
3-15-82	.030	11.0	6.6	1278
6-28-82	.035	68.0	6.5	1400
6-28-82	.014	69.0	6.6	1400
6-28-82	.025	68.0	6.6	1400
6-28-82	.021	69.0	6.5	1400
9-20-82	.013	37.0	6.7	1240
9-20-82	ND(0.010)	37.0	6.6	1240
9-20-82	.027	37.0	6.5	1240
9-20-82	.025	37.0	6.7	1240
# Points	48	48	48	48
Mean	0.030187	31.060416	6.85625	1041.6875
Std. Dev.	0.023964	22.09295	0.48461	391.76432
Variance	0.793851	0.711289	0.070681	0.376086

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : 3-1
EPA ID :

Semi-Annual Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
06-10-84	0.04	2	7.0	840
06-10-84	0.03	3	6.9	840
06-10-84	0.02	3	7.0	860
06-10-84	0.02	4	7.0	840
# Points	4	4	4	4
Mean	0.0275	3	6.975	845
Std. Dev.	0.009574	0.81649	0.05	10
Variance	0.348145	0.272163	0.007168	0.011834
t*	0.455038	8.728347	1.59868	3.464825
tc	3.805736	2.432016	3.029174	2.41408
	t - OK	T - Failed	t - OK	T - Failed

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : 3-2
EPA ID :

Semi-Annual Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
06-10-84	0.02	ND(2)	7.9	610
06-10-84	0.02	3	7.9	650
06-10-84	0.04	2	7.9	650
06-10-84	0.06	2	7.9	670
# Points	4	4	4	4
Mean	0.035	1.75	7.9	645
Std. Dev.	0.019148	1.2583	0	25.16611
Variance	0.547085	0.719028	0	0.039017
t*	0.472836	9.017729	14.922012	6.847772
tc	4.293517	2.477764	2.669984	2.498587
	t - OK	T - Failed	T - Failed	T - Failed

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : 3-4
EPA ID :

Semi-Annual Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
06-10-84	0.03	ND(2)	7.9	1400
06-10-84	0.05	ND(2)	8.0	1400
06-10-84	0.03	2	8.0	1400
06-10-84	ND(0.01)	2	7.9	1300
# Points	4	4	4	4
Mean	0.0275	1	7.95	1375
Std. Dev.	0.020615	1.33333	0.0577	50
Variance	0.749636	1.33333	0.007257	0.036363
t*	0.247148	9.22727	14.455546	5.391117
tc	4.324048	2.487215	3.131001	2.747934
	t - OK	T - Failed	T - Failed	T - Failed

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : 3-5
EPA ID :

Semi-Annual Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
06-10-84	0.04	ND(2)	7.2	710
06-10-84	ND(0.01)	3	7.2	740
06-10-84	0.02	4	7.2	760
06-10-84	ND(0.01)	4	7.2	740
# Points	4	4	4	4
Mean	0.015	2.75	7.2	737.5
Std. Dev.	0.019148	1.89296	0	20.61552
Variance	1.276533	0.688349	0	0.027953
t*	1.491993	8.51098	4.914435	5.292231
tc	4.293517	2.571	2.669984	2.466388
	t - OK	T - Failed	T - Failed	T - Failed

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : 3-6
EPA ID :

Semi-Annual Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
06-09-84	0.01	ND(2)	7.7	290
06-09-84	ND(0.01)	ND(2)	7.8	290
06-09-84	ND(0.03)	2	7.8	290
06-09-84	0.03	2	7.8	290
# Points	4	4	4	4
Mean	0.01	1	7.775	290
Std. Dev.	0.014142	1.33333	0.05	0
Variance	1.4142	1.33333	0.00643	0
t*	2.564731	9.22727	12.368739	13.29331
tc	4.127116	2.487215	3.029174	2.397451
	t - OK	T - Failed	T - Failed	T - Failed

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : 3-7
EPA ID :

Semi-Annual Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
06-10-84	4.4	6	7.2	6300
06-10-84	4.9	5	7.2	6300
06-10-84	5.6	6	7.2	6300
06-10-84	3.8	6	7.3	6300
# Points	4	4	4	4
Mean	4.675	5.75	7.225	6300
Std. Dev.	0.76321	0.5	0.05	0
Variance	0.163253	0.086956	0.00692	0
t*	12.171303	7.912917	4.964324	92.991274
tc	4.540823	2.410545	3.029174	2.397451
	T - Failed	T - Failed	T - Failed	T - Failed

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : 3-8
EPA ID :

Semi-Annual Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
06-10-84	0.04	9	7.7	430
06-10-84	0.02	9	7.7	430
06-10-84	0.02	8	7.7	420
06-10-84	0.01	10	7.7	430
# Points	4	4	4	4
Mean	0.0225	9	7.7	427.5
Std. Dev.	0.012583	0.81649	0	5
Variance	0.559244	0.090721	0	0.011695
t*	1.070761	6.862014	12.062704	10.851074
tc	4.043481	2.432016	2.669984	2.401632
	t - OK	T - Failed	T - Failed	T - Failed

Summary Well Monitoring Report

Site : AMMUNITION BURNING GROUNDS
Well : 3-9
EPA ID :

Semi-Annual Well Monitoring

Date Sampled	Total Organic Halogen mg/L	Total Organic Carbon mg/L	pH S.U.	Specific Conductance umhos
06-10-84	0.01	ND(2)	7.4	1300
06-10-84	0.02	ND(2)	7.4	1200
06-10-84	0.02	ND(2)	7.4	1200
06-10-84	0.02	ND(2)	7.4	1300
# Points	4	4	4	4
Mean	0.0175	0	7.4	1250
Std. Dev.	0.005	0	0	57.73502
Variance	0.285714	0	0	0.046188
t*	2.973283	9.740349	7.773742	3.281094
tc	3.132993	2.39745	2.669984	2.840609
	t - OK	T - Failed	T - Failed	T - Failed

The student t-values used in this report are calculated as described in the July 26, 1982 and January 26, 1983 Federal Register Part 264 of Title 40, and incorporate Cochran's approximation to the Behrens-Fisher Student's t-tes The following equations were used to determine the various statistical values required for the t-test comparison.

(m)	= Monitoring well data set
(b)	= Upgradient baseline well data set
n	= Number of observations in a set of data
X	= Arithmetic mean of the data set
s2	= Sum of the squares of the deviation divided by n-1
s	= Square root of s2
CV	= s divided by X
K	= s2 divided by n
t*	= (X(m) - X(b)) divided by the square root of (K(m)+K(b))
tc	= (K(m)t(m)+K(b)t(b)) divided by (K(m)+K(b)) where t() = value from the standard t-table with (n-1) degrees of freedom at the appropriate level of significa

If t* is greater than or equal to tc for a parameter then the conclusion is that there has been a significant change for the parameter being test otherwise there has been no significant change. Those parameters that have have a significant change are indicated as 't - Failed', and those without a significant change are indicated as 't - OK'.

Error messages used in this report indicate:

# Points < 16	- A minimum of 16 data points (four quarters of analyses done in quadruplicate) are required fo background wells.
# Points < 4	- A minium of 4 data points (analyses done in quadruplicate) are required.
# Points < 2	- Statistics are meaningless.
Check CV	- CV < 1 indicates abnormal distribution of data. See Federal Register for action.
Bkgd CV	- CV of basline data < 1 indicates abnormal distribution of data. See Federal Register for action.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: ABG 3-25
ERG SAMPLE NO: 06/110435
MATRIX: NATURAL WATER
DATE COLLECTED: 06-11-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.
7777 EXCHANGE STREET
CLEVELAND, OHIO 44125 (216) 447-0790

PROJECT V6998.3
REPORT DATE 05-16-84

CLIENT P.O.: CLEVELAND
REPORT: 7027

SAMPLES RECVD: 03-19-84
REFER TECHNICAL QUESTIONS
TO: JAMES ENORES

CLIENT:
COMMANDER
CRANE N.W.S.C.
CODE 0924 CATHY ANDREWS
CRANE, INDIANA 47522

APPROVED: James J. Bolyer

***
RESIDUAL SAMPLES WILL
BE HELD FOR TWO WEEKS
***

CLIENT I.D.: ABG-3-7
ERG SAMPLE NO: 03/105028
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.93	mg/L
ORGANIC BROMIDE	0.003	mg/L
ORGANIC IODINE	0.067	mg/L
RDX (BY HPLC)	15	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-12
ERG SAMPLE NO: 03/105029
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	0.006	mg/L
ORGANIC IODINE	0.003	mg/L
RDX (BY HPLC)	90	ug/L
HMX (BY HPLC)	40	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-15
ERG SAMPLE NO: 03/105030
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998.3 - COMMANDER 05-16-84

CLIENT I.D.: ABG-3-15
ERG SAMPLE NO: 03/105030
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.004	mg/L
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-17
ERG SAMPLE NO: 03/105031
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
RDX (BY HPLC)	30	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-20
ERG SAMPLE NO: 03/105032
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-24
ERG SAMPLE NO: 03/105033
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998.3 - COMMANDER 05-16-84

CLIENT I.D.: ABG-3-24
ERG SAMPLE NO: 03/105033
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	40	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-25
ERG SAMPLE NO: 03/105034
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.006	mg/L
RDX (BY HPLC)	10	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-5 (A)
ERG SAMPLE NO: 03/105035
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.024	mg/L
CARBON, TOTAL ORGANIC,	20	mg/L
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CONDUCTANCE, SPECIFIC	680	umho/cm
CHLORIDE	14	mg/L
IRON, TOTAL	1.4	mg/L
MANGANESE, TOTAL	5.5	mg/L
PHENOLS	<0.01	mg/L
SODIUM, TOTAL	67	mg/L
SULFATE	37	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998.3 - COMMANDER 05-16-84

CLIENT I.D.: ABG-3-5 (B)
ERG SAMPLE NO: 03/105036
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.042	mg/L
CARBON, TOTAL ORGANIC,	15	mg/L
CONDUCTANCE, SPECIFIC	680	umho/cm

CLIENT I.D.: ABG-3-5 (C)
ERG SAMPLE NO: 03/105037
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.012	mg/L
CARBON, TOTAL ORGANIC,	31	mg/L
CONDUCTANCE, SPECIFIC	680	umho/cm

CLIENT I.D.: ABG-3-5 (D)
ERG SAMPLE NO: 03/105038
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.025	mg/L
CARBON, TOTAL ORGANIC,	25	mg/L
CONDUCTANCE, SPECIFIC	680	umho/cm

CLIENT I.D.: SMART REPORT
ERG SAMPLE NO: 03/105039
MATRIX: SPECIAL REPORTS
DATE COLLECTED: NG

PARAMETER	RESULTS	UNITS

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6P42 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-1 (A)
ERG SAMPLE NO: 02/102320
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.010	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	800	umho/c
pH, FIELD,	6.7	S.U.
RDX (BY HPLC)	36	ug/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V8998 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-1 (A)
ERG SAMPLE NO: 02/102320
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CHLORIDE	4	mg/L
IRON, TOTAL	0.01	mg/L
MANGANESE, TOTAL	0.032	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	3.8	mg/L
SULFATE	160	mg/L

CLIENT I.D.: ABG 3-1 (B)
ERG SAMPLE NO: 02/102321
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.010	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	780	umho/cm
pH, FIELD,	6.8	S.U.

CLIENT I.D.: ABG 3-1 (C)
ERG SAMPLE NO: 02/102322
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.15	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.013	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	780	umho/cm
pH, FIELD,	6.7	S.U.

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO V6998 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-1 (D)
ERG SAMPLE NO: 02/102323
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.14	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.014	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	760	umho/cm
pH, FIELD,	6.7	S.U.

CLIENT I.D.: ABG 3-2 (A)
ERG SAMPLE NO: 02/102324
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	400	umho/cm
pH, FIELD,	7.0	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CHLORIDE	2	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	0.055	mg/L
PHENOLS	0.004	mg/L
SODIUM, TOTAL	30	mg/L
SULFATE	60	mg/L

CLIENT I.D.: ABG 3-2 (B)
ERG SAMPLE NO: 02/102325
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 4588 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-2 (B)
ERG SAMPLE NO: 02/102325
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
CONDUCTANCE, SPECIFIC	360	umho/cm
pH, FIELD,	6.9	S.U.

CLIENT I.D.: ABG 3-2 (C)
ERG SAMPLE NO: 02/102326
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	3	mg/L
CONDUCTANCE, SPECIFIC	400	umho/cm
pH, FIELD,	6.9	S.U.

CLIENT I.D.: ABG 3-2 (D)
ERG SAMPLE NO: 02/102327
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	400	umho/cm
pH, FIELD,	7.0	S.U.

CLIENT I.D.: ABG 3-6 (A)
ERG SAMPLE NO: 02/102328
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.05	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

CLIENT I.D. : ABG 3-6 (A)
ERG SAMPLE NO: 02/102328
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
CONDUCTANCE, SPECIFIC	350	umho/cm
pH, FIELD,	7.0	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CHLORIDE	1	mg/L
IRON, TOTAL	0.01	mg/L
MANGANESE, TOTAL	<0.005	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	43	mg/L
SULFATE	12	mg/L

CLIENT I.D. : ABG 3-6 (B)
ERG SAMPLE NO: 02/102329
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.13	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	2	mg/L
CONDUCTANCE, SPECIFIC	350	umho/cm
pH, FIELD,	7.0	S.U.

CLIENT I.D. : ABG 3-6 (C)
ERG SAMPLE NO: 02/102330
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	350	umho/cm
pH, FIELD,	7.0	S.U.

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-6 (D)
ERG SAMPLE NO: 02/102331
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	2	mg/L
CONDUCTANCE, SPECIFIC	350	umho/cm
pH, FIELD,	7.0	S.U.

CLIENT I.D.: ABG 3-7 (A)
ERG SAMPLE NO: 02/102332
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	4.2	mg/L
ORGANIC BROMIDE	ND (0.004)	mg/L
ORGANIC IODINE	0.48	mg/L
CARBON, TOTAL ORGANIC,	7	mg/L
CONDUCTANCE, SPECIFIC	6900	umho/cm
pH, FIELD,	6.9	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CHLORIDE	41	mg/L
IRON, TOTAL	0.04	mg/L
MANGANESE, TOTAL	8.1	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	23	mg/L
SULFATE	4300	mg/L

CLIENT I.D.: ABG 3-7 (B)
ERG SAMPLE NO: 02/102333
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	3.8	mg/L
ORGANIC BROMIDE	ND (0.004)	mg/L
ORGANIC IODINE	0.45	mg/L
CARBON, TOTAL ORGANIC,	7	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-7 (B)
ERG SAMPLE NO: 02/102833
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
CONDUCTANCE, SPECIFIC	6900	umho/cm
pH, FIELD,	6.9	S.U.

CLIENT I.D.: ABG 3-7 (C)
ERG SAMPLE NO: 02/102834
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	4.6	mg/L
ORGANIC BROMIDE	ND (0.004)	mg/L
ORGANIC IODINE	0.51	mg/L
CARBON, TOTAL ORGANIC,	6	mg/L
CONDUCTANCE, SPECIFIC	6900	umho/cm
pH, FIELD,	6.9	S.U.

CLIENT I.D.: ABG 3-7 (D)
ERG SAMPLE NO: 02/102835
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	3.8	mg/L
ORGANIC BROMIDE	ND (0.004)	mg/L
ORGANIC IODINE	0.43	mg/L
CARBON, TOTAL ORGANIC,	7	mg/L
CONDUCTANCE, SPECIFIC	6900	umho/cm
pH, FIELD,	7.0	S.U.

CLIENT I.D.: ABG 3-9 (A)
ERG SAMPLE NO: 02/102836
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO V6798 - COMMANDER 04-30-84

CLIENT I.D. ABG 3-9 (A)
ERG SAMPLE NO: 02/102336
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	5	mg/L
CONDUCTANCE, SPECIFIC	1300	umho/cm
pH, FIELD,	7.0	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CHLORIDE	2	mg/L
IRON, TOTAL	0.09	mg/L
MANGANESE, TOTAL	1.1	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	26	mg/L
SULFATE	330	mg/L

CLIENT I.D.: ABG 3-9 (B)
ERG SAMPLE NO: 02/102337
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	5	mg/L
CONDUCTANCE, SPECIFIC	1300	umho/cm
pH, FIELD,	7.0	S.U.

CLIENT I.D.: ABG 3-9 (C)
ERG SAMPLE NO: 02/102338
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	1300	umho/cm
pH, FIELD,	7.0	S.U.

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6979 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-9 (D)
ERG SAMPLE NO: 02/100339
MATRIX: NATURAL WATER
DATE COLLECTED: 02-01-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	1200	umho/
pH, FIELD,	7.0	S.U.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-4 (A)
ERG SAMPLE NO: 02/102435
MATRIX: NATURAL WATER
DATE COLLECTED: 02-02-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.06	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.019	mg/L
CARBON, TOTAL ORGANIC,	6	mg/L
CONDUCTANCE, SPECIFIC	1200	umho/cm
pH, FIELD,	7.9	S.U.
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-4 (A)
ERG SAMPLE NO: 02/102435
MATRIX: NATURAL WATER
DATE COLLECTED: 02-02-84

PARAMETER	RESULTS	UNITS
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CHLORIDE	3	mg/L
IRON, TOTAL	0.26	mg/L
MANGANESE, TOTAL	0.20	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	370	mg/L
SULFATE	36	mg/L

CLIENT I.D.: ABG 3-4 (B)
ERG SAMPLE NO: 02/102436
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.04	mg/L
ORGANIC BROMIDE	ND (0.004)	mg/L
ORGANIC IODINE	0.056	mg/L
CARBON, TOTAL ORGANIC,	7	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/cm
pH, FIELD,	7.9	S.U.

CLIENT I.D.: ABG 3-4 (C)
ERG SAMPLE NO: 02/102437
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	4	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/cm
pH, FIELD,	7.9	S.U.

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO V6998 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-4 (D)
ERG SAMPLE NO: 02/102438
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	4	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/cm
pH, FIELD,	7.9	S.U.

CLIENT I.D.: ABG 3-8 (A)
ERG SAMPLE NO: 02/102439
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.13	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CARBON, TOTAL ORGANIC,	2	mg/L
CONDUCTANCE, SPECIFIC	550	umho/cm
pH, FIELD,	7.2	S.U.
RDX (BY HPLC)	ND (25)	ug/L
COMMENTS: HIGH DETECTION LIMIT DUE TO REDUCED AMOUNT EXTRACTED.		
HMX (BY HPLC)	ND (25)	ug/L
COMMENTS: HIGHER DETECTION LIMIT DUE TO REDUCED AMOUNT EXTRACTED.		
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CHLORIDE	4	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	0.017	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	13	mg/L
SULFATE	50	mg/L

CLIENT I.D.: ABG 3-8 (B)
ERG SAMPLE NO: 02/102440
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.12	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: ABG 3-B (B)
ERG SAMPLE NO: 02/102440
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.006	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	480	umho/
pH, FIELD,	7.3	S.U.

CLIENT I.D.: ABG 3-B (C)
ERG SAMPLE NO: 02/102441
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.29	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	2	mg/L
CONDUCTANCE, SPECIFIC	480	umho/
pH, FIELD,	7.2	S.U.

CLIENT I.D.: ABG 3-B (D)
ERG SAMPLE NO: 02/102442
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.30	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	2	mg/L
CONDUCTANCE, SPECIFIC	480	umho/
pH, FIELD,	7.2	S.U.

CONTINUED

ENVIRONMENTAL RESEARCH GROUP, INC

7777 EXCHANGE STREET
CLEVELAND, OHIO 44125
(216) 447-0790

PRELIM REPORT: PROJECT 6998.3
REPORT DATE: 04-30-84

CLIENT:
COMMANDER
CRANE N.W.S.C.
CODE 0924 CATHY ANDREWS
CRANE, INDIANA 47522

CLIENT P.O.: CLEVELAND
REPORT: 6755
SAMPLES RECVD: 03-19-84
REFER TECHNICAL QUESTIONS
TO: JAMES ENDRES

Samples Jim Bond Took

APPROVED: _____

***
RESIDUAL SAMPLES WILL
BE HELD FOR TWO WEEKS
***

CLIENT I.D.: ABG-3-7
ERG SAMPLE NO: 03/105028
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.93	mg/L
ORGANIC BROMIDE	0.003	mg/L
ORGANIC IODINE	0.067	mg/L
RDX (BY HPLC)	NOT DONE	
HMX (BY HPLC)	NOT DONE	
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-12
ERG SAMPLE NO: 03/105029
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	0.006	mg/L
ORGANIC IODINE	0.003	mg/L
RDX (BY HPLC)	NOT DONE	
HMX (BY HPLC)	NOT DONE	
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-15
ERG SAMPLE NO: 03/105030
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.004	mg/L
RDX (BY HPLC)	NOT DONE	
HMX (BY HPLC)	NOT DONE	
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CONTINUED

CLIENT I.D.: ABG-3-17
ERG SAMPLE NO: 03/105031
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
RDX (BY HPLC)	NOT DONE	
HMX (BY HPLC)	NOT DONE	
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-20
ERG SAMPLE NO: 03/105032
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
RDX (BY HPLC)	NOT DONE	
HMX (BY HPLC)	NOT DONE	
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-24
ERG SAMPLE NO: 03/105033
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
RDX (BY HPLC)	NOT DONE	
HMX (BY HPLC)	NOT DONE	
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-25
ERG SAMPLE NO: 03/105034
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.006	mg/L
RDX (BY HPLC)	NOT DONE	

CONTINUED

CLIENT I.D.: ABG-3-25
ERG SAMPLE NO: 03/105034
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HMX (BY HPLC)	NOT DONE	
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: ABG-3-5 (A)
ERG SAMPLE NO: 03/105035
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.024	mg/L
CARBON, TOTAL ORGANIC,	20	mg/L
RDX (BY HPLC)	NOT DONE	
HMX (BY HPLC)	NOT DONE	
TNT (TRINITROTOLUENE)	ND (10)	ug/L
CONDUCTANCE, SPECIFIC	680	umho/cm
CHLORIDE	14	mg/L
IRON, TOTAL	1.4	mg/L
MANGANESE, TOTAL	5.5	mg/L
PHENOLS	<0.01	mg/L
SODIUM, TOTAL	67	mg/L
SULFATE	37	mg/L

CLIENT I.D.: ABG-3-5 (B)
ERG SAMPLE NO: 03/105036
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.042	mg/L
CARBON, TOTAL ORGANIC,	15	mg/L
CONDUCTANCE, SPECIFIC	680	umho/cm

CLIENT I.D.: ABG-3-5 (C)
ERG SAMPLE NO: 03/105037
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L

CONTINUED

CLIENT I.D.: ABG-3-5 (C)
ERG SAMPLE NO: 03/105037
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.012	mg/L
CARBON, TOTAL ORGANIC,	31	mg/L
CONDUCTANCE, SPECIFIC	680	umho/cm

CLIENT I.D.: ABG-3-5 (D)
ERG SAMPLE NO: 03/105038
MATRIX: NATURAL WATER

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.025	mg/L
CARBON, TOTAL ORGANIC,	25	mg/L
CONDUCTANCE, SPECIFIC	680	umho/cm

CLIENT I.D.: SMART REPORT
ERG SAMPLE NO: 03/105039
MATRIX: SPECIAL REPORTS
DATE COLLECTED: NG

PARAMETER	RESULTS	UNITS

FR - SEE FIELD REPORT FOR RESULT
NA - NOT APPLICABLE TO TEST REQUESTED
ND - NONDETECTED, DETECTION LIMIT IN ()
SD - SAMPLE DAMAGED
SR - SEE ATTACHED REPORT FOR RESULT
< - POSITIVE RESULT BUT AT UNQUANTIFIABLE CONCENTRATION BELOW INDICATED LEVEL

THANK YOU FOR YOUR BUSINESS !

Repeat Sampling December 1983/January 1984-ABG

RUN DATE: 15 MAR 84

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND (ABG)

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-1	3-2	3-4	3-6	3-3	3-8
WATER										
LEVELS (A)	09 DEC 83		FT	561.2	559.4					
LEVELS (A)	10 DEC 83		FT				542.1			
PH(FIELD)	11 DEC 83		PH				6.3			
PH(FIELD)	11 DEC 83		PH				6.4			
PH(FIELD)	11 DEC 83		PH				6.3			
PH(FIELD)	11 DEC 83		PH				6.4			
PH(LAB)	11 DEC 83		PH				8.0			
SPEC COND	11 DEC 83	1.	UMC				1610.			
SPEC COND	11 DEC 83	1.	UMC				1630.			
TOC	11 DEC 83	1.0	MGL				272.0			
TOX	10 DEC 83	.010	MGL	.030 C						
TOX	10 DEC 83	.010	MGL	.025 C						
TOX	10 DEC 83	.010	MGL	.027 C						
TOX	10 DEC 83	.010	MGL	.030 C						
TOX	04 JAN 84	.010	MGL		.018 C					
TOX	04 JAN 84	.010	MGL		.022 C					
TOX	04 JAN 84	.010	MGL		.022 C					
TOX	04 JAN 84	.010	MGL		.017 C					

Enclosure (

Commander
Naval Weapons Support Center
Crane, Indiana 47522

Attn: Ms. Cathy Andrews

Date: February 17, 1984

Project Number: 7011.3 (con't)

ERG Sample #	Crane Sample ID	PCB	TOTAL ORGANIC HALOGENS Organic Chloride	Organic Bromide	Organic Iodine
23,638	ABG-3-1	----	ND-0.01	ND-0.004	0.013

ND-non-detectable; detection limits are shown next to "ND" notations.

PCB results are reported in mg/kg

Total Organic Halogen results are reported in mg/l

RUN DATE: 15 MAR 84

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7	
WATER LEVELS (A)	10 DEC 83		FT	541.2	548.6	
PH(LAB)	11 DEC 83		PH		6.9	
SPEC COND	11 DEC 83	1.	UMC		2120.	
SPEC COND	11 DEC 83	1.	UMC		2090.	
TOC	11 DEC 83	1.0	MGL	7.8		
TOX	11 DEC 83	.010	MGL		5.230	C
TOX	11 DEC 83	.010	MGL		7.120	C
TOX	11 DEC 83	.010	MGL		4.730	C
TOX	11 DEC 83	.010	MGL		6.370	C

RUN DATE: 15 MAR 84

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 3-1 (BACKGROUND WELL)

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.709	1028.687	30.787	.027
BACKGROUND STANDARD DEV	.304	264.552	23.994	.023
BACKGROUND SAMPLE SIZE	32	32	32	32
CALCULATED MEAN	6.450	795.000	23.250	.115
CALCULATED STANDARD DEV	.058	5.774	.500	.006
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	34	34	34	34
REFERENCE/BOOK T-VALUE	2.728	2.441	2.441	2.441
CALCULATED T-VALUE	1.680	-1.744	-.620	7.533
ACCEPT TEST?	OK	OK	OK	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN SITE: AMMUNITION BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 3-2

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.709	1028.687	30.787	.027
BACKGROUND STANDARD DEV	.304	264.552	23.994	.023
BACKGROUND SAMPLE SIZE	32	32	32	32
CALCULATED MEAN	6.825	1098.750	48.750	.035
CALCULATED STANDARD DEV	.050	2.500	.500	.005
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	34	34	34	34
REFERENCE/BOOK T-VALUE	2.728	2.441	2.441	2.441
CALCULATED T-VALUE	.753	.523	1.478	.685
ACCEPT TEST?	OK	OK	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 3-4

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.709	1028.687	30.787	.027
BACKGROUND STANDARD DEV	.304	264.552	23.994	.023
BACKGROUND SAMPLE SIZE	32	32	32	32
CALCULATED MEAN	7.900	1650.000	189.750	.033
CALCULATED STANDARD DEV	.000	.000	2.217	.009
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	34	34	34	34
REFERENCE/BOOK T-VALUE	2.728	2.441	2.441	2.441
CALCULATED T-VALUE	7.737	4.638	13.078	.511
ACCEPT TEST?	REJECT	REJECT	REJECT	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 3-5

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.709	1028.687	30.787	.027
BACKGROUND STANDARD DEV	.304	264.552	23.994	.023
BACKGROUND SAMPLE SIZE	32	32	32	32
CALCULATED MEAN	7.025	910.000	70.500	.036
CALCULATED STANDARD DEV	.050	.000	.577	.002
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	34	34	34	34
REFERENCE/BOOK T-VALUE	2.728	2.441	2.441	2.441
CALCULATED T-VALUE	2.050	-.886	3.268	.772
ACCEPT TEST?	OK	OK	REJECT	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 3-6

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.709	1028.687	30.787	.027
BACKGROUND STANDARD DEV	.304	264.552	23.994	.023
BACKGROUND SAMPLE SIZE	32	32	32	32
CALCULATED MEAN	6.975	530.000	46.250	.007
CALCULATED STANDARD DEV	.050	.000	.957	.004
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	34	34	34	34
REFERENCE/BOOK T-VALUE	2.728	2.441	2.441	2.441
CALCULATED T-VALUE	1.726	-3.722	1.273	-1.693
ACCEPT TEST?	OK	OK	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 3-7

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.709	1028.687	30.787	.027
BACKGROUND STANDARD DEV	.304	264.552	23.994	.023
BACKGROUND SAMPLE SIZE	32	32	32	32
CALCULATED MEAN	6.925	3600.000	36.250	2.232
CALCULATED STANDARD DEV	.050	.000	.500	.021
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	34	34	34	34
REFERENCE/BOOK T-VALUE	2.728	2.441	2.441	2.441
CALCULATED T-VALUE	1.401	19.194	.450	182.403
ACCEPT TEST?	OK	REJECT	OK	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 3-8

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.709	1028.687	30.787	.027
BACKGROUND STANDARD DEV	.304	264.552	23.994	.023
BACKGROUND SAMPLE SIZE	32	32	32	32
CALCULATED MEAN	6.875	520.000	17.750	.027
CALCULATED STANDARD DEV	.050	.000	.500	.004
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	34	34	34	34
REFERENCE/BOOK T-VALUE	2.728	2.441	2.441	2.441
CALCULATED T-VALUE	1.077	-3.797	-1.073	.021
ACCEPT TEST?	OK	OK	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN SITE: AMMUNITION BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 3-9 (BACKGROUND WELL)

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.709	1028.687	30.787	.027
BACKGROUND STANDARD DEV	.304	264.552	23.994	.023
BACKGROUND SAMPLE SIZE	32	32	32	32
CALCULATED MEAN	6.875	1225.000	30.000	.147
CALCULATED STANDARD DEV	.050	5.774	.816	.005
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	34	34	34	34
REFERENCE/BOOK T-VALUE	2.728	2.441	2.441	2.441
CALCULATED T-VALUE	1.077	1.465	-.065	10.322
ACCEPT TEST?	OK	OK	OK	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-11	3-2	3-4	3-6	3-3	3-8
WATER										
LEVELS (A)	26 JUL 83		FT	560.7	559.7	615.3	544.0	545.0		545.9
LEVELS (A)	27 JUL 83		FT						485.6	
GROSS ALPHA	26 JUL 83	1.30	PCL	1.20	.80					
GROSS ALPHA	28 JUL 83	1.30	PCL			3.70	10.50	4.40		1.30
RADIUM-226	28 JUL 83	.20	PCL				ND			
GROSS BETA	26 JUL 83	1.30	PCL	.50	7.30					
GROSS BETA	28 JUL 83	1.30	PCL			.70	.70	.40		.40
PH(FIELD)	26 JUL 83		PH	6.9	6.5					
PH(FIELD)	26 JUL 83		PH	6.8	6.5					
PH(FIELD)	26 JUL 83		PH	6.9	6.4					
PH(FIELD)	26 JUL 83		PH	6.9	6.4					
PH(FIELD)	28 JUL 83		PH			6.8	7.9	6.9		6.9
PH(FIELD)	28 JUL 83		PH			6.9	7.9	7.0		6.9
PH(FIELD)	28 JUL 83		PH			6.8	7.9	7.0		6.9
PH(FIELD)	28 JUL 83		PH			6.8	7.9	7.0		6.8
SPEC COND	26 JUL 83	1.	UMC	1230.	800.					
SPEC COND	26 JUL 83	1.	UMC	1220.	800.					
SPEC COND	26 JUL 83	1.	UMC	1230.	790.					
SPEC COND	26 JUL 83	1.	UMC	1220.	790.					
SPEC COND	28 JUL 83	1.	UMC			1100.	1650.	530.		520.
SPEC COND	28 JUL 83	1.	UMC			1095.	1650.	530.		520.
SPEC COND	28 JUL 83	1.	UMC			1100.	1650.	530.		520.
SPEC COND	28 JUL 83	1.	UMC			1100.	1650.	530.		520.
TOC	26 JUL 83	1.0	MGL	30.0	23.0					
TOC	26 JUL 83	1.0	MGL	30.0	23.0					
TOC	26 JUL 83	1.0	MGL	31.0	24.0					
TOC	26 JUL 83	1.0	MGL	29.0	23.0					
TOC	28 JUL 83	1.0	MGL			49.0	189.0	46.0		18.0
TOC	28 JUL 83	1.0	MGL			49.0	189.0	45.0		18.0
TOC	28 JUL 83	1.0	MGL			48.0	188.0	47.0		18.0
TOC	28 JUL 83	1.0	MGL			49.0	193.0	47.0		17.0
TOX	26 JUL 83	.010	MGL	.140 C	.120 C					
TOX	26 JUL 83	.010	MGL	.150 C	.110 C					
TOX	26 JUL 83	.010	MGL	.150 C	.120 C					
TOX	26 JUL 83	.010	MGL	.150 C	.110 C					
TOX	28 JUL 83	.010	MGL			.032 C	.046 C	ND		.027 C
TOX	28 JUL 83	.010	MGL			.037 C	.032 C	ND		.029 C
TOX	28 JUL 83	.010	MGL			.030 C	.028 C	.014 C		.022 C
TOX	28 JUL 83	.010	MGL			.041 C	.026 C	ND		.031 C
2,4,6-TNT	26 JUL 83	100.	UGL	ND	ND					

Incl 2

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 3-9	B 3-1	3-2	3-4	3-6	3-3	3-8
2,4,6-TNT	28 JUL 83	100.	UGL			ND	ND	ND		ND
2,4-DNT	26 JUL 83	100.	UGL	ND	ND					
2,4-DNT	28 JUL 83	100.	UGL			ND	ND	ND		ND
2,6-DNT	26 JUL 83	100.	UGL	ND	ND					
2,6-DNT	28 JUL 83	100.	UGL			ND	ND	ND		ND
RDX	26 JUL 83	100.	UGL	ND	ND					
RDX	28 JUL 83	100.	UGL			ND	ND	ND		ND
HMX	26 JUL 83	100.	UGL	ND	ND					
HMX	28 JUL 83	100.	UGL			ND	ND	ND		ND
TETRYL	26 JUL 83	100.	UGL	ND	ND					
TETRYL	28 JUL 83	100.	UGL			ND	ND	ND		ND

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5		3-7	
WATER							
LEVELS (A)	26 JUL 83		FT	547.2		548.7	
GROSS ALPHA	27 JUL 83	1.30	PCL			3.20	
GROSS ALPHA	28 JUL 83	1.30	PCL	5.30			
RADIUM-226	28 JUL 83	.05	PCL	.60			
GROSS BETA	27 JUL 83	1.30	PCL			122.70	
GROSS BETA	28 JUL 83	1.30	PCL	4.20			
STRONTIUM-90	27 JUL 83	.2	PCL			ND	
PH(FIELD)	27 JUL 83		PH			6.9	
PH(FIELD)	27 JUL 83		PH			7.0	
PH(FIELD)	27 JUL 83		PH			6.9	
PH(FIELD)	27 JUL 83		PH			6.9	
PH(FIELD)	28 JUL 83		PH	7.1			
PH(FIELD)	28 JUL 83		PH	7.0			
PH(FIELD)	28 JUL 83		PH	7.0			
PH(FIELD)	28 JUL 83		PH	7.0			
SPEC COND	27 JUL 83	1.	UMC			3600.	
SPEC COND	27 JUL 83	1.	UMC			3600.	
SPEC COND	27 JUL 83	1.	UMC			3600.	
SPEC COND	27 JUL 83	1.	UMC			3600.	
SPEC COND	28 JUL 83	1.	UMC	910.			
SPEC COND	28 JUL 83	1.	UMC	910.			
SPEC COND	28 JUL 83	1.	UMC	910.			
SPEC COND	28 JUL 83	1.	UMC	910.			
TOC	27 JUL 83	1.0	MGL			36.0	
TOC	27 JUL 83	1.0	MGL			36.0	
TOC	27 JUL 83	1.0	MGL			36.0	
TOC	27 JUL 83	1.0	MGL			37.0	
TOC	28 JUL 83	1.0	MGL	71.0			
TOC	28 JUL 83	1.0	MGL	71.0			
TOC	28 JUL 83	1.0	MGL	70.0			
TOC	28 JUL 83	1.0	MGL	70.0			
TOX	27 JUL 83	.010	MGL			2.230	C
TOX	27 JUL 83	.010	MGL			2.260	C
TOX	27 JUL 83	.010	MGL			2.210	C
TOX	27 JUL 83	.010	MGL			2.230	C
TOX	28 JUL 83	.010	MGL	.038	C		
TOX	28 JUL 83	.010	MGL	.034	C		
TOX	28 JUL 83	.010	MGL	.035	C		
TOX	28 JUL 83	.010	MGL	.037	C		
2,4,6-TNT	27 JUL 83	100.	UGL			ND	

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7
2,4,6-TNT	28 JUL 83	100.	UGL	ND	
2,4-DNT	27 JUL 83	100.	UGL		ND
2,4-DNT	28 JUL 83	100.	UGL	ND	
2,6-DNT	27 JUL 83	100.	UGL		ND
2,6-DNT	28 JUL 83	100.	UGL	ND	
RDX	27 JUL 83	100.	UGL		ND
RDX	28 JUL 83	50.	UGL	129.	
HMX	27 JUL 83	100.	UGL		ND
HMX	28 JUL 83	100.	UGL	ND	
TETRYL	27 JUL 83	100.	UGL		ND
TETRYL	28 JUL 83	100.	UGL	ND	

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

Incl 3

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

SAMPLING SITES RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
WATER										
LEVELS (A)	26 JUL 83		FT	560.7	615.3	559.7	544.0	545.0		545.9
LEVELS (A)	27 JUL 83		FT						485.6	
GROSS ALPHA	26 JUL 83	1.30	PCL	1.20		.80				
GROSS ALPHA	28 JUL 83	1.30	PCL		3.70		10.50	4.40		1.30
RADIUM-226	28 JUL 83	.20	PCL				ND			
GROSS BETA	26 JUL 83	1.30	PCL	.50		7.30				
GROSS BETA	28 JUL 83	1.30	PCL		.70		.70	.40		.40
PH(FIELD)	26 JUL 83		PH	6.9		6.5				
PH(FIELD)	26 JUL 83		PH	6.8		6.5				
PH(FIELD)	26 JUL 83		PH	6.9		6.4				
PH(FIELD)	26 JUL 83		PH	6.9		6.4				
PH(FIELD)	28 JUL 83		PH		6.9		7.9	6.9		6.9
PH(FIELD)	28 JUL 83		PH		6.8		7.9	7.0		6.9
PH(FIELD)	28 JUL 83		PH		6.8		7.9	7.0		6.8
PH(FIELD)	28 JUL 83		PH		6.8		7.9	7.0		6.9
SPEC COND	26 JUL 83	1.	UMC	1230.		800.				
SPEC COND	26 JUL 83	1.	UMC	1220.		800.				
SPEC COND	26 JUL 83	1.	UMC	1230.		790.				
SPEC COND	26 JUL 83	1.	UMC	1220.		790.				
SPEC COND	28 JUL 83	1.	UMC		1095.		1650.	530.		520.
SPEC COND	28 JUL 83	1.	UMC		1100.		1650.	530.		520.
SPEC COND	28 JUL 83	1.	UMC		1100.		1650.	530.		520.
SPEC COND	28 JUL 83	1.	UMC		1100.		1650.	530.		520.
TOC	26 JUL 83	1.0	MGL	30.0		23.0				
TOC	26 JUL 83	1.0	MGL	30.0		23.0				
TOC	26 JUL 83	1.0	MGL	31.0		24.0				
TOC	26 JUL 83	1.0	MGL	29.0		23.0				
TOC	28 JUL 83	1.0	MGL		49.0		189.0	45.0		18.0
TOC	28 JUL 83	1.0	MGL		49.0		188.0	47.0		18.0
TOC	28 JUL 83	1.0	MGL		48.0		193.0	47.0		17.0
TOC	28 JUL 83	1.0	MGL		49.0		189.0	46.0		18.0
TOX	26 JUL 83	.010	MGL	.140 C		.120 C				
TOX	26 JUL 83	.010	MGL	.150 C		.110 C				
TOX	26 JUL 83	.010	MGL	.150 C		.120 C				
TOX	26 JUL 83	.010	MGL	.150 C		.110 C				
TOX	28 JUL 83	.010	MGL		.041 C		.032 C	.014 C		.022 C
TOX	28 JUL 83	.010	MGL		.030 C		.026 C	ND		.031 C
TOX	28 JUL 83	.010	MGL		.037 C		.028 C	ND		.029 C
TOX	28 JUL 83	.010	MGL		.032 C		.046 C	ND		.027 C
2,4,6-TNT	26 JUL 83	100.	UGL	ND		ND				

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
2,4,6-TNT	28 JUL 83	100.	UGL		ND		ND	ND		ND
2,4-DNT	26 JUL 83	100.	UGL	ND		ND				
2,4-DNT	28 JUL 83	100.	UGL		ND		ND	ND		ND
2,6-DNT	26 JUL 83	100.	UGL	ND		ND				
2,6-DNT	28 JUL 83	100.	UGL		ND		ND	ND		ND
RDX	26 JUL 83	100.	UGL	ND		ND				
RDX	28 JUL 83	100.	UGL		ND		ND	ND		ND
HMX	26 JUL 83	100.	UGL	ND		ND				
HMX	28 JUL 83	100.	UGL		ND		ND	ND		ND
TETRYL	26 JUL 83	100.	UGL	ND		ND				
TETRYL	28 JUL 83	100.	UGL		ND		ND	ND		ND

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5		3-7	
WATER							
LEVELS (A)	26 JUL 83		FT	547.2		548.7	
GROSS ALPHA	27 JUL 83	1.30	PCL			3.20	
GROSS ALPHA	28 JUL 83	1.30	PCL	5.30			
RADIUM-226	28 JUL 83	.05	PCL	.60			
GROSS BETA	27 JUL 83	1.30	PCL			122.70	
GROSS BETA	28 JUL 83	1.30	PCL	4.20			
STRONTIUM-90	27 JUL 83	.2	PCL			ND	
PH(FIELD)	27 JUL 83		PH			7.0	
PH(FIELD)	27 JUL 83		PH			6.9	
PH(FIELD)	27 JUL 83		PH			6.9	
PH(FIELD)	27 JUL 83		PH			6.9	
PH(FIELD)	28 JUL 83		PH	7.1			
PH(FIELD)	28 JUL 83		PH	7.0			
PH(FIELD)	28 JUL 83		PH	7.0			
PH(FIELD)	28 JUL 83		PH	7.0			
SPEC COND	27 JUL 83	1.	UMC			3600.	
SPEC COND	27 JUL 83	1.	UMC			3600.	
SPEC COND	27 JUL 83	1.	UMC			3600.	
SPEC COND	27 JUL 83	1.	UMC			3600.	
SPEC COND	28 JUL 83	1.	UMC	910.			
SPEC COND	28 JUL 83	1.	UMC	910.			
SPEC COND	28 JUL 83	1.	UMC	910.			
SPEC COND	28 JUL 83	1.	UMC	910.			
TOC	27 JUL 83	1.0	MGL			36.0	
TOC	27 JUL 83	1.0	MGL			36.0	
TOC	27 JUL 83	1.0	MGL			36.0	
TOC	27 JUL 83	1.0	MGL			37.0	
TOC	28 JUL 83	1.0	MGL	71.0			
TOC	28 JUL 83	1.0	MGL	70.0			
TOC	28 JUL 83	1.0	MGL	70.0			
TOC	28 JUL 83	1.0	MGL	71.0			
TOX	27 JUL 83	.010	MGL			2.260	C
TOX	27 JUL 83	.010	MGL			2.230	C
TOX	27 JUL 83	.010	MGL			2.210	C
TOX	27 JUL 83	.010	MGL			2.230	C
TOX	28 JUL 83	.010	MGL	.038	C		
TOX	28 JUL 83	.010	MGL	.035	C		
TOX	28 JUL 83	.010	MGL	.037	C		
TOX	28 JUL 83	.010	MGL	.034	C		
2,4,6-TNT	27 JUL 83	100.	UGL			ND	

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7
2,4,6-TNT	28 JUL 83	100.	UGL	ND	
2,4-DNT	27 JUL 83	100.	UGL		ND
2,4-DNT	28 JUL 83	100.	UGL	ND	
2,6-DNT	27 JUL 83	100.	UGL		ND
2,6-DNT	28 JUL 83	100.	UGL	ND	
RDX	27 JUL 83	100.	UGL		ND
RDX	28 JUL 83	50.	UGL	129.	
HMX	27 JUL 83	100.	UGL		ND
HMX	28 JUL 83	100.	UGL	ND	
TETRYL	27 JUL 83	100.	UGL		ND
TETRYL	28 JUL 83	100.	UGL	ND	

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 01 SEP 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
RADIUM-226	25 APR 83	.20	PCL	.30	ND	ND	.40	ND		
RADIUM-228	25 APR 83	.20	PCL	.20	ND	2.70	ND	ND		

RUN DATE: 01 SEP 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7
RADIUM-226	25 APR 83	.20	PCL	.60	.50
RADIUM-228	25 APR 83	.20	PCL	ND	2.20

RUN DATE: 01 SEP 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

B UPGRADIENT SITE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

@BRKPT PRINT$

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
WATER										
LEVELS (A)	28 FEB 83		FT				544.8	545.4	491.3	547.0
LEVELS (A)	01 MAR 83		FT	560.9	617.2	559.8				
CHLORIDE	01 MAR 83	1.0	MGL	12.0	2.0	4.0	4.0	ND		4.0
IRON	01 MAR 83	.03	MGL	ND	ND	ND	.13	ND		ND
MANGANESE	01 MAR 83	.01	MGL	1.52#	.61#	.24#	.14#	.03		.13#
PHENOL	01 MAR 83	.01	MGL	ND	ND	.02	.01	ND		.01
SODIUM	01 MAR 83	1.	MGL	31.	104.	4.	380.	6.		20.
SULFATE	01 MAR 83	5.0	MGL	440.0#	110.0	140.0	91.0	7.0		150.0
PH(FIELD)	01 MAR 83		PH	6.8	7.3	6.8	8.0	7.0		7.0
PH(FIELD)	01 MAR 83		PH	6.8	7.3	6.8	8.0	7.0		7.0
PH(FIELD)	01 MAR 83		PH	6.8	7.3	6.8	8.0	7.0		7.0
PH(FIELD)	01 MAR 83		PH	6.8	7.4	6.8	8.0	7.0		7.0
SPEC COND	01 MAR 83	1.	UMC	1370.	468.	650.	1550.	360.		665.
SPEC COND	01 MAR 83	1.	UMC	1370.	470.	650.	1560.	360.		660.
SPEC COND	01 MAR 83	1.	UMC	1370.	470.	655.	1560.	360.		660.
SPEC COND	01 MAR 83	1.	UMC	1375.	470.	655.	1560.	358.		660.
TOC	01 MAR 83	1.0	MGL	49.0	33.0	40.0	97.0	29.0		11.0
TOC	01 MAR 83	1.0	MGL	48.0	34.0	39.0	96.0	29.0		11.0
TOC	01 MAR 83	1.0	MGL	49.0	33.0	40.0	95.0	30.0		11.0
TOC	01 MAR 83	1.0	MGL	49.0	33.0	39.0	94.0	30.0		11.0
TOX	01 MAR 83	.010	MGL	.019 C	.026 C	.023 C	.070 C	.036 C		.020 C
TOX	01 MAR 83	.010	MGL	.018 C	.014 C	.025 C	.063 C	ND		.018 C
TOX	01 MAR 83	.010	MGL	.019 C	.025 C	.027 C	.075 C	.028 C		.022 C
TOX	01 MAR 83	.010	MGL	.021 C	.024 C	.029 C	.029 C	.021 C		.016 C
2,4,6-TNT	01 MAR 83	100.	UGL	ND	ND	ND	ND	ND		ND
2,4-DNT	01 MAR 83	100.	UGL	ND	ND	ND	ND	ND		ND
2,6-DNT	01 MAR 83	100.	UGL	ND	ND	ND	ND	ND		ND
RDX	01 MAR 83	100.	UGL	ND	ND	ND	ND	ND		ND
HMX	01 MAR 83	100.	UGL	ND	ND	ND	ND	ND		ND
TETRYL	01 MAR 83	100.	UGL	ND	ND	ND	ND	ND		ND

Incl 1

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5		3-7	
WATER							
LEVELS (A)	01 MAR 83		FT	547.2		549.5	
CHLORIDE	01 MAR 83	1.0	MGL	11.0		27.4	
IRON	01 MAR 83	.03	MGL	ND		ND	
MANGANESE	01 MAR 83	.01	MGL	2.10#		8.50#	
PHENOL	01 MAR 83	.01	MGL	ND		ND	
SODIUM	01 MAR 83	1.	MGL	144.		25.	
SULFATE	01 MAR 83	5.0	MGL	190.0		2710.0#	
PH(FIELD)	01 MAR 83		PH	6.9		6.8	
PH(FIELD)	01 MAR 83		PH	6.9		6.8	
PH(FIELD)	01 MAR 83		PH	7.0		6.8	
PH(FIELD)	01 MAR 83		PH	6.9		6.8	
SPEC COND	01 MAR 83	1.	UMC	880.		3500.	
SPEC COND	01 MAR 83	1.	UMC	875.		3500.	
SPEC COND	01 MAR 83	1.	UMC	885.		3550.	
SPEC COND	01 MAR 83	1.	UMC	880.		3500.	
TOC	01 MAR 83	1.0	MGL	52.0		45.0	
TOC	01 MAR 83	1.0	MGL	51.0		45.0	
TOC	01 MAR 83	1.0	MGL	53.0		44.0	
TOC	01 MAR 83	1.0	MGL	53.0		44.0	
TOX	01 MAR 83	.010	MGL	.013	C	3.270	C
TOX	01 MAR 83	.010	MGL	.029	C	1.880	C
TOX	01 MAR 83	.010	MGL	.025	C	3.320	C
TOX	01 MAR 83	.010	MGL	.032	C	4.630	C
2,4,6-TNT	01 MAR 83	100.	UGL	ND		ND	
2,4-DNT	01 MAR 83	100.	UGL	ND		ND	
2,6-DNT	01 MAR 83	100.	UGL	ND		ND	
RDX	01 MAR 83	100.	UGL	ND		400.	
HMX	01 MAR 83	100.	UGL	ND		ND	
TETRYL	01 MAR 83	100.	UGL	ND		ND	

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: AMMUNITION BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 1-15	1-16	1-17	3-18	3-19	3-20
BENZENE	19 JAN 83	1.	UGL				ND	ND	ND
BENZENE	15 FEB 83	1.	UGL	ND	ND	ND			
CARBON TETRACHLORIDE	19 JAN 83	1.	UGL				ND	ND	ND
CARBON TETRACHLORIDE	15 FEB 83	1.	UGL	ND	ND	ND			
CHLOROBENZENE	19 JAN 83	1.	UGL				ND	ND	ND
CHLOROBENZENE	15 FEB 83	1.	UGL	ND	ND	ND			
1,2-DICHLOROETHANE	19 JAN 83	1.	UGL				ND	ND	ND
1,2-DICHLOROETHANE	15 FEB 83	1.	UGL	32.	23.	5.			
1,1,1-TRICHLOROETHANE	19 JAN 83	1.	UGL				31.	12.	16.
1,1,1-TRICHLOROETHANE	15 FEB 83	1.	UGL	7.	23.	23.			
1,1-DICHLOROETHANE	19 JAN 83	1.	UGL				ND	ND	ND
1,1-DICHLOROETHANE	15 FEB 83	1.	UGL	ND	ND	ND			
1,1,2-TRICHLOROETHANE	19 JAN 83	1.	UGL				ND	ND	ND
1,1,2-TRICHLOROETHANE	15 FEB 83	1.	UGL	17.	ND	ND			
1,1,2,2-TETRACHLOROETHANE	19 JAN 83	1.	UGL				ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	15 FEB 83	1.	UGL	1500.	5400.	ND			
CHLOROETHANE	19 JAN 83	2.	UGL				ND	ND	ND
CHLOROETHANE	15 FEB 83	2.	UGL	ND	ND	ND			
2-CHLOROETHYLVINYL ETHER	19 JAN 83	2.	UGL				ND	ND	ND
2-CHLOROETHYLVINYL ETHER	15 FEB 83	2.	UGL	ND	ND	ND			
CHLOROFORM	19 JAN 83	1.	UGL				2.	ND	ND
CHLOROFORM	15 FEB 83	1.	UGL	39.	43.	8.			
1,2-DICHLOROBENZENE	19 JAN 83	1.	UGL				ND	ND	ND
1,2-DICHLOROBENZENE	15 FEB 83	1.	UGL	ND	ND	ND			
1,3-DICHLOROBENZENE	19 JAN 83	1.	UGL				ND	ND	ND
1,3-DICHLOROBENZENE	15 FEB 83	1.	UGL	ND	ND	ND			
1,4-DICHLOROBENZENE	19 JAN 83	1.	UGL				ND	ND	ND
1,4-DICHLOROBENZENE	15 FEB 83	1.	UGL	ND	ND	ND			
1,1-DICHLOROETHYLENE	19 JAN 83	1.	UGL				ND	ND	ND
1,1-DICHLOROETHYLENE	15 FEB 83	1.	UGL	2.	1.	ND			
TRANS-1,2-DICHLOROETHYLENE	19 JAN 83	1.	UGL				ND	ND	ND
TRANS-1,2-DICHLOROETHYLENE	15 FEB 83	1.	UGL	18.	39.	ND			
1,2-DICHLOROPROPANE	19 JAN 83	1.	UGL				ND	ND	ND
1,2-DICHLOROPROPANE	15 FEB 83	1.	UGL	ND	ND	ND			
1,3-DICHLOROPROPENE	19 JAN 83	1.	UGL				ND	ND	ND
1,3-DICHLOROPROPENE	15 FEB 83	1.	UGL	ND	1000.†	ND			
ETHYLBENZENE	19 JAN 83	1.	UGL				ND	ND	ND
ETHYLBENZENE	15 FEB 83	1.	UGL	ND	ND	ND			
METHYLENE CHLORIDE	19 JAN 83	1.	UGL				18.	9.	13.
METHYLENE CHLORIDE	15 FEB 83	1.	UGL	3.	7.	7.			
CHLOROMETHANE	19 JAN 83	2.	UGL				ND	ND	ND

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 1-15	1-16	1-17	3-18	3-19	3-20
CHLOROMETHANE	15 FEB 83	2.	UGL	ND	ND	ND			
BROMOMETHANE	19 JAN 83	2.	UGL				ND	ND	ND
BROMOMETHANE	15 FEB 83	2.	UGL	ND	ND	ND			
BROMOFORM	19 JAN 83	2.	UGL				ND	ND	ND
BROMOFORM	15 FEB 83	2.	UGL	ND	ND	ND			
BROMODICHLOROMETHANE	19 JAN 83	1.	UGL				ND	ND	ND
BROMODICHLOROMETHANE	15 FEB 83	1.	UGL	ND	ND	ND			
TRICHLOROFLUOROMETHANE	19 JAN 83	1.	UGL				4.	ND	3.
TRICHLOROFLUOROMETHANE	15 FEB 83	1.	UGL	ND	ND	4.			
DICHLOROFLUOROMETHANE	19 JAN 83	2.	UGL				ND	ND	ND
DICHLOROFLUOROMETHANE	15 FEB 83	2.	UGL	ND	ND	ND			
DIBROMOCHLOROMETHANE	19 JAN 83	1.	UGL				ND	ND	ND
DIBROMOCHLOROMETHANE	15 FEB 83	1.	UGL	ND	ND	ND			
TETRACHLOROETHYLENE	19 JAN 83	1.	UGL				3.	ND	ND
TETRACHLOROETHYLENE	15 FEB 83	1.	UGL	ND	ND	68.			
TOLUENE	19 JAN 83	1.	UGL				ND	ND	ND
TOLUENE	15 FEB 83	1.	UGL	ND	ND	ND			
TRICHLOROETHYLENE	19 JAN 83	1.	UGL				11.	14.	20.
TRICHLOROETHYLENE	15 FEB 83	1.	UGL	330.	ND ++	67.			
VINYL CHLORIDE	19 JAN 83	1.	UGL				ND	ND	ND
VINYL CHLORIDE	15 FEB 83	1.	UGL	ND	ND	ND			

+ Compound detected at 1000 UGL is trans-1,3-dichloropropene

++ Detection limit of 25 UGL

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-21	3-22	3-23	3-24	3-25	5-14
BENZENE	13 JAN 83	1.	UGL						ND
BENZENE	31 JAN 83	1.	UGL	ND	ND	ND			
BENZENE	10 FEB 83	1.	UGL				ND	4.	
CARBON TETRACHLORIDE	13 JAN 83	1.	UGL						ND
CARBON TETRACHLORIDE	31 JAN 83	1.	UGL	ND	ND	ND			
CARBON TETRACHLORIDE	10 FEB 83	1.	UGL				ND	ND	
CHLOROBENZENE	13 JAN 83	1.	UGL						ND
CHLOROBENZENE	31 JAN 83	1.	UGL	ND	ND	ND			
CHLOROBENZENE	10 FEB 83	1.	UGL				ND	ND	
1,2-DICHLOROETHANE	13 JAN 83	1.	UGL						ND
1,2-DICHLOROETHANE	31 JAN 83	1.	UGL	ND	ND	ND			
1,2-DICHLOROETHANE	10 FEB 83	1.	UGL				ND	ND	
1,1,1-TRICHLOROETHANE	13 JAN 83	1.	UGL						ND
1,1,1-TRICHLOROETHANE	31 JAN 83	1.	UGL	3.	11.	15.			
1,1,1-TRICHLOROETHANE	10 FEB 83	1.	UGL				20.	40.	
1,1-DICHLOROETHANE	13 JAN 83	1.	UGL						ND
1,1-DICHLOROETHANE	31 JAN 83	1.	UGL	ND	ND	ND			
1,1-DICHLOROETHANE	10 FEB 83	1.	UGL				ND	ND	
1,1,2-TRICHLOROETHANE	13 JAN 83	1.	UGL						ND
1,1,2-TRICHLOROETHANE	31 JAN 83	1.	UGL	ND	ND	ND			
1,1,2-TRICHLOROETHANE	10 FEB 83	1.	UGL				ND	ND	
1,1,2,2-TETRACHLOROETHANE	13 JAN 83	1.	UGL						ND
1,1,2,2-TETRACHLOROETHANE	31 JAN 83	1.	UGL	ND	ND	ND			
1,1,2,2-TETRACHLOROETHANE	10 FEB 83	1.	UGL				ND	ND	
CHLOROETHANE	13 JAN 83	2.	UGL						ND
CHLOROETHANE	31 JAN 83	2.	UGL	ND	ND	ND			
CHLOROETHANE	10 FEB 83	2.	UGL				ND	ND	
2-CHLOROETHYLVINYL ETHER	13 JAN 83	2.	UGL						ND
2-CHLOROETHYLVINYL ETHER	31 JAN 83	2.	UGL	ND	ND	ND			
2-CHLOROETHYLVINYL ETHER	10 FEB 83	2.	UGL				ND	ND	
CHLOROFORM	13 JAN 83	1.	UGL						ND
CHLOROFORM	31 JAN 83	1.	UGL	ND	ND	ND			
CHLOROFORM	10 FEB 83	1.	UGL				3.	7.	
1,2-DICHLOROBENZENE	13 JAN 83	1.	UGL						ND
1,2-DICHLOROBENZENE	31 JAN 83	1.	UGL	ND	ND	ND			
1,2-DICHLOROBENZENE	10 FEB 83	1.	UGL				ND	ND	
1,3-DICHLOROBENZENE	13 JAN 83	1.	UGL						ND
1,3-DICHLOROBENZENE	31 JAN 83	1.	UGL	ND	ND	ND			
1,3-DICHLOROBENZENE	10 FEB 83	1.	UGL				ND	ND	
1,4-DICHLOROBENZENE	13 JAN 83	1.	UGL						ND
1,4-DICHLOROBENZENE	31 JAN 83	1.	UGL	ND	ND	ND			

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-21	3-22	3-23	3-24	3-25	5-14
1,4-DICHLOROBENZENE	10 FEB 83	1.	UGL				ND	ND	
1,1-DICHLOROETHYLENE	13 JAN 83	1.	UGL						ND
1,1-DICHLOROETHYLENE	31 JAN 83	1.	UGL	ND	1.	ND			
1,1-DICHLOROETHYLENE	10 FEB 83	1.	UGL				ND	ND	
TRANS 1,2-DICHLOROETHYLENE	13 JAN 83	1.	UGL						ND
TRANS 1,2-DICHLOROETHYLENE	31 JAN 83	1.	UGL	ND	ND	ND			
TRANS 1,2-DICHLOROETHYLENE	10 FEB 83	1.	UGL				30.	ND	
1,2-DICHLOROPROPANE	13 JAN 83	1.	UGL						ND
1,2-DICHLOROPROPANE	31 JAN 83	1.	UGL	ND	ND	ND			
1,2-DICHLOROPROPANE	10 FEB 83	1.	UGL				ND	ND	
1,3-DICHLOROPROPENE	13 JAN 83	1.	UGL						ND
1,3-DICHLOROPROPENE	31 JAN 83	1.	UGL	ND	ND	ND			
1,3-DICHLOROPROPENE	10 FEB 83	1.	UGL				ND	ND	
ETHYLBENZENE	13 JAN 83	1.	UGL						ND
ETHYLBENZENE	31 JAN 83	1.	UGL	ND	ND	ND			
ETHYLBENZENE	10 FEB 83	1.	UGL				ND	ND	
METHYLENE CHLORIDE	13 JAN 83	1.	UGL						ND
METHYLENE CHLORIDE	31 JAN 83	1.	UGL	11.	3.	5.			
METHYLENE CHLORIDE	10 FEB 83	1.	UGL				4.	4.	
CHLOROMETHANE	13 JAN 83	2.	UGL						ND
CHLOROMETHANE	31 JAN 83	2.	UGL	ND	ND	ND			
CHLOROMETHANE	10 FEB 83	2.	UGL				ND	ND	
BROMOMETHANE	13 JAN 83	2.	UGL						ND
BROMOMETHANE	31 JAN 83	2.	UGL	ND	ND	ND			
BROMOMETHANE	10 FEB 83	2.	UGL				ND	ND	
BROMOFORM	13 JAN 83	2.	UGL						ND
BROMOFORM	31 JAN 83	2.	UGL	ND	ND	ND			
BROMOFORM	10 FEB 83	2.	UGL				ND	ND	
BROMODICHLOROMETHANE	13 JAN 83	1.	UGL						ND
BROMODICHLOROMETHANE	31 JAN 83	1.	UGL	ND	ND	ND			
BROMODICHLOROMETHANE	10 FEB 83	1.	UGL				ND	ND	
TRICHLOROFLUOROMETHANE	13 JAN 83	1.	UGL						ND
TRICHLOROFLUOROMETHANE	31 JAN 83	1.	UGL	ND	6.	9.			
TRICHLOROFLUOROMETHANE	10 FEB 83	1.	UGL				2.	4.	
DICHLOROFLUOROMETHANE	13 JAN 83	2.	UGL						ND
DICHLOROFLUOROMETHANE	31 JAN 83	2.	UGL	ND	ND	ND			
DICHLOROFLUOROMETHANE	10 FEB 83	2.	UGL				ND	ND	
DIBROMOCHLOROMETHANE	13 JAN 83	1.	UGL						ND
DIBROMOCHLOROMETHANE	31 JAN 83	1.	UGL	ND	ND	ND			
DIBROMOCHLOROMETHANE	10 FEB 83	1.	UGL				ND	ND	
TETRACHLOROETHYLENE	13 JAN 83	1.	UGL						ND

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-21	3-22	3-23	3-24	3-25	5-14
TETRACHLOROETHYLENE	31 JAN 83	1.	UGL	ND	ND	ND			
TETRACHLOROETHYLENE	10 FEB 83	1.	UGL				ND	ND	
TOLUENE	13 JAN 83	1.	UGL						ND
TOLUENE	31 JAN 83	1.	UGL	ND	ND	ND			
TOLUENE	10 FEB 83	1.	UGL				ND	ND	
TRICHLOROETHYLENE	13 JAN 83	1.	UGL						ND
TRICHLOROETHYLENE	31 JAN 83	1.	UGL	5.	22.	24.			
TRICHLOROETHYLENE	10 FEB 83	1.	UGL				83.	36.	
VINYL CHLORIDE	13 JAN 83	1.	UGL						ND
VINYL CHLORIDE	31 JAN 83	1.	UGL	ND	ND	ND			
VINYL CHLORIDE	10 FEB 83	1.	UGL				ND	ND	

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
WATER LEVELS (A)	19 SEP 82		FT	560.4	617.4	559.9	547.6	545.6	483.8	546.8
ARSENIC	20 SEP 82	.010	MGL	ND	ND	ND		ND		ND
BARIUM	20 SEP 82	.1	MGL	ND	ND	ND		ND		ND
CADMIUM	20 SEP 82	.005	MGL	ND	ND	ND		ND		ND
CHROMIUM	20 SEP 82	.010	MGL	ND	ND	ND		ND		ND
FLUORIDE	20 SEP 82	.10	MGL	.10	.22	.15	1.00	ND		ND
LEAD	20 SEP 82	.010	MGL	ND	ND	ND		ND		ND
MERCURY	20 SEP 82	.2	UGL	ND	ND	ND		ND		ND
NO2+NO3 AS N	20 SEP 82	.05	MGL	.05	.06	.37	ND	.85		2.00
SELENIUM	20 SEP 82	.005	MGL	ND	ND	ND		ND		ND
SILVER	20 SEP 82	.01	MGL	ND	ND	ND		ND		ND
ENDRIN	20 SEP 82	.04	UGL	ND	ND	ND	ND	ND		ND
LINDANE	20 SEP 82	.08	UGL	ND	ND	ND	ND	ND		ND
TOXAPHENE	20 SEP 82	1.6	UGL	ND	ND	ND	ND	ND		ND
METHOXYCHLOR	20 SEP 82	1.6	UGL	ND	ND	ND	ND	ND		ND
2,4-D	20 SEP 82	3.8	UGL	ND	ND	ND	ND	ND		ND
SILVEX	20 SEP 82	.5	UGL	ND	ND	ND	ND	ND		ND
GROSS ALPHA	20 SEP 82	6.39	PCL	6.26	<6.39	<4.75		<2.71		<2.94
GROSS BETA	20 SEP 82	1.30	PCL	2.81	4.82	3.85		1.25		2.47
CHLORIDE	20 SEP 82	1.0	MGL	4.0	4.6	6.0	8.0	3.0		4.0
IRON	20 SEP 82	.03	MGL	.09	.21	ND		.33#		.36#
MANGANESE	20 SEP 82	.01	MGL	1.44#	.95#	.19#		.02		.04
PHENOL	20 SEP 82	.01	MGL	.02	ND	.02		ND		ND
SODIUM	20 SEP 82	1.	MGL	26.	136.	4.		7.		12.
SULFATE	20 SEP 82	5.0	MGL	400.0#	136.0	110.0	130.0	29.0		98.0
PH(FIELD)	20 SEP 82		PH	6.7	7.2	6.6		6.8		6.8
PH(FIELD)	20 SEP 82		PH	6.6	7.0	6.5		6.7		6.9
PH(FIELD)	20 SEP 82		PH	6.5	7.1	6.7		6.8		6.9
PH(FIELD)	20 SEP 82		PH	6.7	7.1	6.6		6.8		6.8
SPEC COND	20 SEP 82	1.	UMC	1240.	1060.	760.	1500.	520.		625.
SPEC COND	20 SEP 82	1.	UMC	1240.	1060.	760.	1500.	520.		625.
SPEC COND	20 SEP 82	1.	UMC	1240.	1060.	760.	1500.	520.		630.
SPEC COND	20 SEP 82	1.	UMC	1240.	1060.	760.	1500.	520.		625.
TOC	20 SEP 82	1.0	MGL	37.0	40.0	18.0		22.0		14.0
TOC	20 SEP 82	1.0	MGL	37.0	39.0	18.0		22.0		14.0
TOC	20 SEP 82	1.0	MGL	37.0	39.0	18.0		23.0		14.0
TOC	20 SEP 82	1.0	MGL	37.0	39.0	18.0		22.0		14.0
TOX	20 SEP 82	.010	MGL	.013 C	ND	.053 C	.010 C	.041 C		ND
TOX	20 SEP 82	.010	MGL	ND	ND	.016 C	.029 C	.030 C		ND
TOX	20 SEP 82	.010	MGL	.029 C	.017 C	ND	.011 C	.028 C		ND

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

SAMPLING SITES RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
TOX	20 SEP 82	.010	MGL	.025 C	ND	.021 C	ND	.049 C		ND
POTASSIUM	20 SEP 82	.10	MGL	4.50	3.80	2.20		2.80		4.10

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7
WATER LEVELS (A)	19 SEP 82		FT	547.2	549.1
ARSENIC	20 SEP 82	.010	MGL	ND	ND
BARIUM	20 SEP 82	.1	MGL	ND	ND
CADMIUM	20 SEP 82	.005	MGL	ND	ND
CHROMIUM	20 SEP 82	.010	MGL	ND	ND
FLUORIDE	20 SEP 82	.10	MGL	.32	.11
LEAD	20 SEP 82	.010	MGL	ND	.040
MERCURY	20 SEP 82	.2	UGL	ND	ND
NO2+NO3 AS N	20 SEP 82	.05	MGL	.69	.13
SELENIUM	20 SEP 82	.005	MGL	ND	.022*
SILVER	20 SEP 82	.01	MGL	ND	ND
ENDRIN	20 SEP 82	.04	UGL	ND	ND
LINDANE	20 SEP 82	.08	UGL	ND	ND
TOXAPHENE	20 SEP 82	1.6	UGL	ND	ND
METHOXYCHLOR	20 SEP 82	1.6	UGL	ND	ND
2,4-D	20 SEP 82	3.8	UGL	ND	ND
SILVEX	20 SEP 82	.5	UGL	ND	ND
GROSS ALPHA	20 SEP 82	7.85	PCL	<7.85	73.70*
GROSS BETA	20 SEP 82	1.30	PCL	6.19	98.20*
URANIUM	20 SEP 82	0.	PCL		3.
CHLORIDE	20 SEP 82	1.0	MGL	14.0	42.0
IRON	20 SEP 82	.03	MGL	.35#	.40#
MANGANESE	20 SEP 82	.01	MGL	2.01#	16.20#
PHENOL	20 SEP 82	.01	MGL	.02	ND
SODIUM	20 SEP 82	1.	MGL	182.	26.
SULFATE	20 SEP 82	5.0	MGL	310.0#	2740.0#
PH(FIELD)	20 SEP 82		PH	7.0	6.6
PH(FIELD)	20 SEP 82		PH	6.9	6.7
PH(FIELD)	20 SEP 82		PH	6.8	6.4#
PH(FIELD)	20 SEP 82		PH	7.1	6.5
SPEC COND	20 SEP 82	1.	UMC	1460.	4980.
SPEC COND	20 SEP 82	1.	UMC	1460.	4950.
SPEC COND	20 SEP 82	1.	UMC	1460.	5000.
SPEC COND	20 SEP 82	1.	UMC	1460.	4950.
TOC	20 SEP 82	1.0	MGL	39.0	28.0
TOC	20 SEP 82	1.0	MGL	39.0	28.0
TOC	20 SEP 82	1.0	MGL	40.0	27.0
TOC	20 SEP 82	1.0	MGL	40.0	27.0
TOX	20 SEP 82	.010	MGL	ND	.580 C
TOX	20 SEP 82	.010	MGL	.019 C	.560 C

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5		3-7	
TOX	20 SEP 82	.010	MGL	ND		.620	C
TOX	20 SEP 82	.010	MGL	.023	C	.480	C
POTASSIUM	20 SEP 82	.10	MGL	3.80		144.00	

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
GROSS ALPHA	17 NOV 81	2.51	PCL		18.50*	ND	ND	5.35		ND
GROSS ALPHA	30 NOV 81	1.30	PCL	3.18						
GROSS ALPHA	04 JAN 82	1.30	PCL		2.00					
GROSS ALPHA	15 MAR 82	1.54	PCL	3.02	ND	ND				ND
GROSS ALPHA	28 JUN 82	5.71	PCL	12.10	14.40	<5.71		8.41		<4.74
GROSS ALPHA	20 SEP 82	6.39	PCL	6.26	<6.39	<4.75		<2.71		<2.94
RADIUM-226	28 JUN 82	.05	PCL	.59	.68	.41		.49		
GROSS BETA	17 NOV 81	1.30	PCL		7.19	2.89	6.69	5.55		3.82
GROSS BETA	30 NOV 81	1.30	PCL	4.88						
GROSS BETA	04 JAN 82	1.61	PCL		ND					
GROSS BETA	15 MAR 82	1.30	PCL	3.79	2.51	2.40				3.24
GROSS BETA	28 JUN 82	1.76	PCL	4.25	5.17	ND		2.47		2.32
GROSS BETA	20 SEP 82	1.30	PCL	2.81	4.82	3.85		1.25		2.47

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7
GROSS ALPHA	17 NOV 81	1.58	PCL	ND	7.35
GROSS ALPHA	04 JAN 82	13.40	PCL		ND
GROSS ALPHA	15 MAR 82	5.56	PCL	4.99	ND
GROSS ALPHA	28 JUN 82	1.30	PCL		263.00*
GROSS ALPHA	20 SEP 82	7.85	PCL	ND	73.70*
RADIUM-226	04 JAN 82	.05	PCL		5.68*
RADIUM-228	14 JAN 82	.75	PCL		ND
GROSS BETA	17 NOV 81	1.30	PCL	3.46	80.60*
GROSS BETA	04 JAN 82	1.30	PCL		87.40*
GROSS BETA	15 MAR 82	1.30	PCL	4.10	79.00*
GROSS BETA	28 JUN 82	1.30	PCL		81.10*
GROSS BETA	20 SEP 82	1.30	PCL	6.19	98.20*
STRONTIUM-90	04 JAN 82	1.0	PCL		ND
STRONTIUM-90	28 JUN 82	1.0	PCL		ND
URANIUM	20 SEP 82	0.	PCL		3.

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
* VALUE EXCEEDS A NATIONAL INTERIM PRIMARY DRINKING WATER REGULATION STANDARD

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND.

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-2	B 3-1	3-4	3-5	3-3
CARBON TETRACHLORIDE	20 SEP 82	1.	UGL	ND	1.	ND	6.	3.	
1,2-DICHLOROETHANE	20 SEP 82	1.	UGL	ND	ND	35.	22.	ND	
METHYLENE CHLORIDE	20 SEP 82	1.	UGL	ND	4.	3.	4.	9.	
TRICHLOROETHYLENE	20 SEP 82	1.	UGL	ND	ND	2.	3.	26.	

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND.

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-6	3-7	3-8	3-10	3-11	3-12
1,1,1-TRICHLOROETHANE	20 SEP 82	1.	UGL	1.	ND	ND			
1,1,1-TRICHLOROETHANE	10 NOV 82	1.	UGL				2.	1.	ND
1,1,2,2-TETRACHLOROETHANE	20 SEP 82	1.	UGL	ND	3500.	3.			
1,1,2,2-TETRACHLOROETHANE	10 NOV 82	1.	UGL				ND	ND	2.
CHLOROETHANE	20 SEP 82	2.	UGL	ND	5.	ND			
CHLOROFORM	10 NOV 82	1.	UGL				ND	8.	69.
1,1-DICHLOROETHYLENE	20 SEP 82	1.	UGL	ND	245.	ND			
TRANS-1,2-DICHLOROETHYLENE	20 SEP 82	1.	UGL	3.	4100.	1.			
TRANS-1,2-DICHLOROETHYLENE	29 NOV 82	1.	UGL		5100.				
METHYLENE CHLORIDE	20 SEP 82	1.	UGL	ND	1.	ND			
METHYLENE CHLORIDE	10 NOV 82	1.	UGL				4.	3.	4.
TRICHLOROFLUOROMETHANE	10 NOV 82	1.	UGL				1.	1.	1.
TETRACHLOROETHYLENE	20 SEP 82	1.	UGL	ND	64.	ND			
TETRACHLOROETHYLENE	10 NOV 82	1.	UGL				2.	ND	1.
TRICHLOROETHYLENE	20 SEP 82	1.	UGL	28.	1400.	37.			
TRICHLOROETHYLENE	10 NOV 82	1.	UGL				15.	7.	368.
TRICHLOROETHYLENE	29 NOV 82	1.	UGL		19000.				

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND.

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-13	3-14	3-15	3-16	3-17
BENZENE	10 NOV 82	1.	UGL	1.	ND			
1,1,1-TRICHLOROETHANE	10 NOV 82	1.	UGL	2.	2.			
CHLOROFORM	10 NOV 82	1.	UGL	13.	3.			
TRANS-1,2-DICHLOROETHYLENE	29 NOV 82	1.	UGL			250.	ND	ND
METHYLENE CHLORIDE	10 NOV 82	1.	UGL	4.	7.			
METHYLENE CHLORIDE	29 NOV 82	1.	UGL			2600.	ND	ND
TRICHLOROFLUOROMETHANE	10 NOV 82	1.	UGL	1.	1.			
TETRACHLOROETHYLENE	10 NOV 82	1.	UGL	ND	1.			
TRICHLOROETHYLENE	10 NOV 82	1.	UGL	9.	9.			
TRICHLOROETHYLENE	29 NOV 82	1.	UGL			150.	ND	ND

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND.

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

B UPGRADIENT SITE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

CRANE NWSC

Results of Analysis for Purgeable Organic Priority Pollutants

Samples Taken 25 Apr 83

Results in ug/L

	3-1	3-24	3-25
Benzene	1	ND	ND
trans-1,2-Dichloroethylene	ND	9	ND

ND - Compound not detected

Analysis by Gas Chromotography; Well 3-1 results confirmed by Mass Spectrometry.

Encl 13

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND.

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

B UPGRADIENT SITE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-3
WATER										
LEVELS (A)	27 JUN 82		FT	560.8	615.7	559.9	543.6	545.1	489.8	546.8
ARSENIC	28 JUN 82	.010	MGL	ND	ND	ND		ND		ND
BARIUM	28 JUN 82	.1	MGL	ND	ND	ND		ND		ND
CADMIUM	28 JUN 82	.005	MGL	ND	ND	ND		ND		ND
CHROMIUM	28 JUN 82	.010	MGL	ND	.020	ND		.020		.010
FLUORIDE	28 JUN 82	.10	MGL	.11	.33	.15		ND		ND
LEAD	28 JUN 82	.010	MGL	ND	ND	ND		ND		ND
MERCURY	28 JUN 82	.2	UGL	ND	ND	ND		ND		ND
NO2+NO3 AS N	28 JUN 82	.05	MGL	ND	.06	.32		.76		2.00
SELENIUM	28 JUN 82	.005	MGL	ND	ND	ND		ND		ND
SILVER	28 JUN 82	.01	MGL	ND	ND	ND		ND		ND
ENDRIN	28 JUN 82	.01	UGL	ND	ND	ND	ND	ND	ND	ND
LINDANE	28 JUN 82	.08	UGL	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	28 JUN 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	28 JUN 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
2,4-D	28 JUN 82	3.8	UGL	ND	ND	ND	ND	ND	ND	ND
SILVEX	28 JUN 82	.5	UGL	ND	ND	ND	ND	ND	ND	ND
GROSS ALPHA	28 JUN 82	5.71	PCL	12.10	14.40	<5.71		8.41		<4.74
RADIUM-226	28 JUN 82	.05	PCL		.68	.41		.49		
GROSS BETA	28 JUN 82	1.76	PCL	4.25	5.17	ND		2.47		2.32
CHLORIDE	28 JUN 82	1.0	MGL	ND	5.0	6.0		4.0		4.0
IRON	28 JUN 82	.03	MGL	.06	.79#	.03		1.31#		.50#
MANGANESE	28 JUN 82	.01	MGL	1.84#	1.37#	.16#		.13#		.01
PHENOL	28 JUN 82	.01	MGL	.08	.09	.09		.01		ND
SODIUM	28 JUN 82	1.	MGL	32.	184.	6.		14.		13.
SULFATE	28 JUN 82	5.0	MGL	321.0#	250.0	130.0		35.0		94.0
PH(FIELD)	28 JUN 82		PH	6.5	6.9	6.6		6.6		6.4#
PH(FIELD)	28 JUN 82		PH	6.6	6.9	6.5		6.6		6.2#
PH(FIELD)	28 JUN 82		PH	6.6	6.8	6.4#		6.5		6.4#
PH(FIELD)	28 JUN 82		PH	6.5	6.8	6.6		6.5		6.5
SPEC COND	28 JUN 82	1.	UMC	1400.	1200.	845.		629.		600.
SPEC COND	28 JUN 82	1.	UMC	1400.	1180.	845.		630.		600.
SPEC COND	28 JUN 82	1.	UMC	1400.	1190.	845.		630.		600.
SPEC COND	28 JUN 82	1.	UMC	1400.	1180.	846.		630.		600.
TOC	28 JUN 82	1.0	MGL	68.0	49.0	69.0		41.0		20.0
TOC	28 JUN 82	1.0	MGL	69.0	49.0	69.0		42.0		20.0
TOC	28 JUN 82	1.0	MGL	68.0	51.0	69.0		40.0		19.0
TOC	28 JUN 82	1.0	MGL	69.0	51.0	67.0		42.0		19.0
TOX	28 JUN 82	.010	MGL	.035 C	.037 C	ND	ND	ND	.220 C	.025 C
TOX	28 JUN 82	.010	MGL	.014 C	.028 C	ND	ND	.012 C	.160 C	.028 C
TOX	28 JUN 82	.010	MGL	.025 C	.029 C	.013 C	ND	ND	.190 C	.027 C
TOX	28 JUN 82	.010	MGL	.021 C	.034 C	ND	ND	.015 C	.200 C	.018 C

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7	
WATER						
LEVELS (A)	27 JUN 82		FT	547.2	548.4	
ARSENIC	28 JUN 82	.010	MGL		.020	
BARIUM	28 JUN 82	.1	MGL		ND	
CADMIUM	28 JUN 82	.005	MGL		ND	
CHROMIUM	28 JUN 82	.010	MGL		.020	
FLUORIDE	28 JUN 82	.10	MGL		.11	
LEAD	28 JUN 82	.010	MGL		.030	
MERCURY	28 JUN 82	.2	UGL		ND	
NO2+NO3 AS N	28 JUN 82	.05	MGL		.11	
SELENIUM	28 JUN 82	.005	MGL		.016*	
SILVER	28 JUN 82	.01	MGL		ND	
ENDRIN	28 JUN 82	.01	UGL		ND	
LINDANE	28 JUN 82	.08	UGL		ND	
TOXAPHENE	28 JUN 82	1.6	UGL		ND	
METHOXYCHLOR	28 JUN 82	1.6	UGL		ND	
2,4-D	28 JUN 82	3.8	UGL		ND	
SILVEX	28 JUN 82	.5	UGL		ND	
GROSS ALPHA	28 JUN 82	1.30	PCL		263.00	
GROSS BETA	28 JUN 82	1.30	PCL		81.10	
STRONTIUM-90	28 JUN 82	1.0	PCL		ND	
CHLORIDE	28 JUN 82	1.0	MGL		50.0	
IRON	28 JUN 82	.03	MGL		.25	
MANGANESE	28 JUN 82	.01	MGL		15.30#	
PHENOL	28 JUN 82	.01	MGL		ND	
SODIUM	28 JUN 82	1.	MGL		43.	
SULFATE	28 JUN 82	5.0	MGL		2890.0#	
PH(FIELD)	28 JUN 82		PH		6.3#	
PH(FIELD)	28 JUN 82		PH		6.6	
PH(FIELD)	28 JUN 82		PH		6.5	
PH(FIELD)	28 JUN 82		PH		6.6	
SPEC COND	28 JUN 82	1.	UMC		6200.	
SPEC COND	28 JUN 82	1.	UMC		6220.	
SPEC COND	28 JUN 82	1.	UMC		6200.	
SPEC COND	28 JUN 82	1.	UMC		6200.	
TOC	28 JUN 82	1.0	MGL		80.0	
TOC	28 JUN 82	1.0	MGL		82.0	
TOC	28 JUN 82	1.0	MGL		79.0	
TOC	28 JUN 82	1.0	MGL		80.0	
TOX	28 JUN 82	.010	MGL		9.580	C
TOX	28 JUN 82	.010	MGL		6.520	C
TOX	28 JUN 82	.010	MGL		7.830	C
TOX	28 JUN 82	.010	MGL		4.670	C

CRANE NWSC
Radiochemistry Results

Well	Date	Gross Alpha	Gross Beta	Radium-226	Radium-228	Strontium-90	Uranium
3-7	20 Sep 82			<0.19		<1.00	

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
WATER										
LEVELS (A)	15 MAR 82		FT	561.2	617.7	559.4	544.8	D	D	546.8
ARSENIC	15 MAR 82	.010	MGL	ND	ND	ND				ND
BARIUM	15 MAR 82	.1	MGL	ND	ND	ND				ND
CADMIUM	15 MAR 82	.005	MGL	ND	ND	ND				ND
CHROMIUM	15 MAR 82	.010	MGL	ND	ND	ND				ND
FLUORIDE	15 MAR 82	.10	MGL	12.00*	ND	.13				.11
LEAD	15 MAR 82	.010	MGL	ND	ND	ND				ND
MERCURY	15 MAR 82	.2	UGL	ND	ND	ND				ND
NO2+NO3 AS N	15 MAR 82	.05	MGL	ND	.59	.31				1.30
SELENIUM	15 MAR 82	.005	MGL	ND	ND	ND				ND
SILVER	15 MAR 82	.01	MGL	ND	ND	.01				ND
ENDRIN	15 MAR 82	.04	UGL	ND	ND	ND	ND			ND
LINDANE	15 MAR 82	.08	UGL	ND	ND	ND	ND			ND
TOXAPHENE	15 MAR 82	1.6	UGL	ND	ND	ND	ND			ND
METHOXYCHLOR	15 MAR 82	1.6	UGL	ND	ND	ND	ND			ND
2,4-D	15 MAR 82	3.8	UGL	ND	ND	ND	ND			ND
SILVEX	15 MAR 82	.5	UGL	ND	ND	ND	ND			ND
GROSS ALPHA	15 MAR 82	1.54	PCL	3.02	ND	ND				ND
GROSS BETA	15 MAR 82	1.30	PCL	3.79	2.51	2.40				3.24
CHLORIDE	15 MAR 82	1.0	MGL	4.0	2.0	6.0				6.0
IRON	15 MAR 82	.03	MGL	.11	.34#	.08				.10
MANGANESE	15 MAR 82	.01	MGL	1.52#	.01	.70#				.10#
PHENOL	15 MAR 82	.01	MGL	.04	.01	.02				.01
SODIUM	15 MAR 82	1.	MGL	33.	12.	3.				18.
SULFATE	15 MAR 82	5.0	MGL	360.0#	37.0	160.0				110.0
PH(FIELD)	15 MAR 82		PH	6.7	6.5	6.6				6.9
PH(FIELD)	15 MAR 82		PH	6.1#	6.5	6.6				6.9
PH(FIELD)	15 MAR 82		PH	6.6	6.5	6.6				6.8
PH(FIELD)	15 MAR 82		PH	6.6	6.5	6.6				6.9
SPEC COND	15 MAR 82	1.	UMC	1280.	226.	732.	1220.			535.
SPEC COND	15 MAR 82	1.	UMC	1279.	225.	730.	1220.			535.
SPEC COND	15 MAR 82	1.	UMC	1279.	224.	735.	1220.			535.
SPEC COND	15 MAR 82	1.	UMC	1278.	225.	734.	1220.			536.
TOC	15 MAR 82	1.0	MGL	10.0	2.0	3.0				5.0
TOC	15 MAR 82	1.0	MGL	11.0	2.0	3.0				5.0
TOC	15 MAR 82	1.0	MGL	11.0	2.0	3.0				5.0
TOC	15 MAR 82	1.0	MGL	11.0	2.0	3.0				5.0
TOX	15 MAR 82	.010	MGL	.022 C	.064 C	.026 C	.016 C			.033 C
TOX	15 MAR 82	.010	MGL	.042 C	.059 C	.017 C	.019 C			ND
TOX	15 MAR 82	.010	MGL	.011 C	.050 C	.030 C	.014 C			.042 C
TOX	15 MAR 82	.010	MGL	.030 C	.063 C	.024 C	.016 C			.033 C

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5		3-7	
WATER LEVELS (A)	15 MAR 82		FT	547.2		550.6	
ARSENIC	15 MAR 82	.010	MGL	ND		ND	
BARIUM	15 MAR 82	.1	MGL	ND		ND	
CADMIUM	15 MAR 82	.005	MGL	ND		ND	
CHROMIUM	15 MAR 82	.010	MGL	ND		ND	
FLUORIDE	15 MAR 82	.10	MGL	.26		ND	
LEAD	15 MAR 82	.010	MGL	.020		.015	
MERCURY	15 MAR 82	.2	UGL	ND		ND	
NO2+NO3 AS N	15 MAR 82	.05	MGL	.89		ND	
SELENIUM	15 MAR 82	.005	MGL	ND		.007	
SILVER	15 MAR 82	.01	MGL	ND		.01	
ENDRIN	15 MAR 82	.04	UGL	ND		ND	
LINDANE	15 MAR 82	.08	UGL	ND		ND	
TOXAPHENE	15 MAR 82	1.6	UGL	ND		ND	
METHOXYCHLOR	15 MAR 82	1.6	UGL	ND		ND	
2,4-D	15 MAR 82	3.8	UGL	ND		ND	
SILVEX	15 MAR 82	.5	UGL	ND		ND	
GROSS ALPHA	15 MAR 82	5.56	PCL	4.99		ND	
GROSS BETA	15 MAR 82	1.30	PCL	4.10		79.00*	
CHLORIDE	15 MAR 82	1.0	MGL	17.7		25.5	
IRON	15 MAR 82	.03	MGL	.13		.50#	
MANGANESE	15 MAR 82	.01	MGL	.77#		15.00#	
PHENOL	15 MAR 82	.01	MGL	.01		.01	
SODIUM	15 MAR 82	1.	MGL	306.		30.	
SULFATE	15 MAR 82	5.0	MGL	560.0#		1760.0#	
PH(FIELD)	15 MAR 82		PH	6.9		6.5	
PH(FIELD)	15 MAR 82		PH	6.9		6.5	
PH(FIELD)	15 MAR 82		PH	6.8		6.5	
PH(FIELD)	15 MAR 82		PH	6.9		6.5	
SPEC COND	15 MAR 82	1.	UMC	1940.		4450.	
SPEC COND	15 MAR 82	1.	UMC	1940.		4450.	
SPEC COND	15 MAR 82	1.	UMC	1940.		4450.	
SPEC COND	15 MAR 82	1.	UMC	1939.		4450.	
TOC	15 MAR 82	1.0	MGL	9.0		8.0	
TOC	15 MAR 82	1.0	MGL	9.0		8.0	
TOC	15 MAR 82	1.0	MGL	10.0		8.0	
TOC	15 MAR 82	1.0	MGL	9.0		8.0	
TOX	15 MAR 82	.010	MGL	.042	C	3.760	C
TOX	15 MAR 82	.010	MGL	.037	C	3.640	C
TOX	15 MAR 82	.010	MGL	.048	C	3.600	C
TOX	15 MAR 82	.010	MGL	.028	C	3.710	C

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN

FACILITY: AMMUNITION BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
* VALUE EXCEEDS A NATIONAL INTERIM PRIMARY DRINKING WATER REGULATION STANDARD
# VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA
D - WELL WAS DRY

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
WATER LEVELS A	13 DEC 81		FT	556.25	617.08	559.85	543.52	545.20	487.78	546.66
ARSENIC	17 NOV 81	.010	MGL		ND	ND	ND	ND		ND
ARSENIC	30 NOV 81	.010	MGL	ND						
BARIUM	17 NOV 81	.1	MGL		ND	ND	ND	ND		ND
BARIUM	30 NOV 81	.1	MGL	ND						
CADMIUM	17 NOV 81	.005	MGL		ND	ND	ND	ND		.005
CADMIUM	30 NOV 81	.005	MGL	ND						
CHROMIUM	17 NOV 81	.010	MGL		ND	ND	.010	ND		ND
CHROMIUM	30 NOV 81	.010	MGL	ND						
FLUORIDE	17 NOV 81	.10	MGL		.41	.16	.92	.13		.12
FLUORIDE	30 NOV 81	.10	MGL	.14						
LEAD	17 NOV 81	.010	MGL		ND	ND	.013	ND		ND
LEAD	30 NOV 81	.010	MGL	ND						
MERCURY	17 NOV 81	.2	UGL		ND	ND	ND	ND		ND
MERCURY	30 NOV 81	.2	UGL	.2						
NO2+NO3 AS N	17 NOV 81	.05	MGL		.06	.27	.10	2.00		2.00
NO2+NO3 AS N	30 NOV 81	.05	MGL	ND						
SELENIUM	17 NOV 81	.005	MGL		ND	ND	ND	ND		ND
SELENIUM	30 NOV 81	.005	MGL	ND						
SILVER	17 NOV 81	.01	MGL		ND	ND	ND	ND		ND
SILVER	30 NOV 81	.01	MGL	ND						
ENDRIN	17 NOV 81	.04	UGL		ND	ND	ND	ND		ND
ENDRIN	30 NOV 81	.04	UGL	ND						
LINDANE	17 NOV 81	.08	UGL		ND	ND	ND	ND		ND
LINDANE	30 NOV 81	.08	UGL	ND						
TOXAPHENE	17 NOV 81	1.6	UGL		ND	ND	ND	ND		ND
TOXAPHENE	30 NOV 81	1.6	UGL	ND						
METHOXYCHLOR	17 NOV 81	1.6	UGL		ND	ND	ND	ND		ND
METHOXYCHLOR	30 NOV 81	1.6	UGL	ND						
2,4-D	17 NOV 81	3.8	UGL		ND	ND	ND	ND		ND
2,4-D	30 NOV 81	3.8	UGL	ND						
SILVEX	17 NOV 81	.5	UGL		ND	ND	ND	ND		ND
SILVEX	30 NOV 81	.5	UGL	ND						
GROSS ALPHA	17 NOV 81	1.30	PCL		18.50	ND	ND	5.35		ND
GROSS ALPHA	30 NOV 81	1.30	PCL	3.18						
GROSS ALPHA	04 JAN 82	1.30	PCL		2.00					
GROSS BETA	17 NOV 81	1.30	PCL		7.19	2.89	6.69	5.55		3.82
GROSS BETA	30 NOV 81	1.30	PCL	4.88						
GROSS BETA	04 JAN 82	1.61	PCL		ND					
TOTCOLBACT	18 NOV 81	1.	PHM		ND	10.*	ND	ND	ND	10.*
TOTCOLBACT	01 DEC 81	1.	PHM	11.*					ND	
CHLORIDE	17 NOV 81	1.0	MGL		9.3	7.1	11.2	4.8		8.2

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: AMMUNITION BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
CHLORIDE	30 NOV 81	1.0	MGL	5.1						
IRON	17 NOV 81	.03	MGL		1.57 *	.04	7.80 *	.09		2.01 *
IRON	30 NOV 81	.03	MGL	.22						
MANGANESE	17 NOV 81	.01	MGL		.72 *	1.99 *	1.00 *	.14 *		.14 *
MANGANESE	30 NOV 81	.01	MGL	.42 *						
PHENOL	17 NOV 81	.01	MGL		.03	ND	.01	ND		ND
PHENOL	30 NOV 81	.01	MGL	ND						
SODIUM	17 NOV 81	1.	MGL		406. *	6.	286. *	13.		43.
SODIUM	30 NOV 81	1.	MGL	31.						
SULFATE	17 NOV 81	5.0	MGL		545.0 *	152.0	224.0	51.6		94.1
SULFATE	30 NOV 81	5.0	MGL	408.0 *						
PH(FIELD)	17 NOV 81		PH		8.1	6.9	8.1	7.3		7.4
PH(FIELD)	17 NOV 81		PH		8.2	6.9	8.1	7.3		7.4
PH(FIELD)	17 NOV 81		PH		8.2	6.9	8.0	7.3		7.3
PH(FIELD)	17 NOV 81		PH		8.1	6.8	8.0	7.3		7.2
PH(FIELD)	30 NOV 81		PH	7.4					8.8 *	
PH(FIELD)	30 NOV 81		PH	7.4					8.8 *	
PH(FIELD)	30 NOV 81		PH	7.4					8.8 *	
PH(FIELD)	30 NOV 81		PH	7.4					8.7 *	
PH(FIELD)	04 JAN 82		PH		6.4 *					
PH(FIELD)	04 JAN 82		PH		6.3 *					
PH(FIELD)	04 JAN 82		PH		6.4 *					
PH(FIELD)	04 JAN 82		PH		6.4 *					
SPEC COND	17 NOV 81	1.	UMC		1800.	750.	1160.	650.		600.
SPEC COND	17 NOV 81	1.	UMC		1800.	760.	1180.	650.		600.
SPEC COND	17 NOV 81	1.	UMC		1800.	770.	1170.	650.		600.
SPEC COND	17 NOV 81	1.	UMC		1790.	770.	1160.	640.		600.
SPEC COND	30 NOV 81	1.	UMC	1210.						
SPEC COND	30 NOV 81	1.	UMC	1210.						
SPEC COND	30 NOV 81	1.	UMC	1210.						
SPEC COND	30 NOV 81	1.	UMC	1210.						
TOC	17 NOV 81	1.0	MGL		38.4	17.1	81.6	6.6		10.2
TOC	17 NOV 81	1.0	MGL		36.5	16.5	85.0	6.0		11.2
TOC	17 NOV 81	1.0	MGL		37.3	17.7	80.9	6.7		10.9
TOC	17 NOV 81	1.0	MGL		35.5	17.5	81.8	6.2		9.0
TOC	30 NOV 81	1.0	MGL	23.5						
TOC	30 NOV 81	1.0	MGL	23.6						
TOC	30 NOV 81	1.0	MGL	23.1						
TOC	30 NOV 81	1.0	MGL	23.2						
TOX	17 NOV 81	10.	UGL		53.C	15.C	28.C	ND		ND
TOX	17 NOV 81	10.	UGL		55.C	25.C	29.C	ND		ND
TOX	17 NOV 81	10.	UGL		57.C	19.C	30.C	ND		ND
TOX	17 NOV 81	10.	UGL		60.C	22.C	29.C	ND		ND

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 3-9	B 3-2	B 3-1	3-4	3-6	3-3	3-8
TOX	30 NOV 81	10.	UGL	32.C						
TOX	30 NOV 81	10.	UGL	88.C						
TOX	30 NOV 81	10.	UGL	79.C						
TOX	30 NOV 81	10.	UGL	97.C						

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES; TRAILING ZEROES DO NOT ALWAYS INDICATE SIGNIFICANCE, BUT ARE THE RESULTS OF COMPUTER FORMATTING.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

C RESULTS ARE FOR UNFILTERED SAMPLE

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7
WATER					
LEVELS A	13 DEC 81		FT	547.25	549.26
ARSENIC	17 NOV 81	.010	MGL	ND	ND
BARIUM	17 NOV 81	.1	MGL	ND	ND
CADMIUM	17 NOV 81	.005	MGL	ND	ND
CHROMIUM	17 NOV 81	.010	MGL	ND	ND
FLUORIDE	17 NOV 81	.10	MGL	.23	.12
LEAD	17 NOV 81	.010	MGL	ND	ND
MERCURY	17 NOV 81	.2	UGL	ND	ND
NO2+NO3 AS N	17 NOV 81	.05	MGL	1.50	.05
SELENIUM	17 NOV 81	.005	MGL	ND	.014 *
SILVER	17 NOV 81	.01	MGL	ND	ND
ENDRIN	17 NOV 81	.04	UGL	ND	ND
LINDANE	17 NOV 81	.08	UGL	ND	ND
TOXAPHENE	17 NOV 81	1.6	UGL	ND	ND
METHOXYCHLOR	17 NOV 81	1.6	UGL	ND	ND
2,4-D	17 NOV 81	3.8	UGL	ND	ND
SILVEX	17 NOV 81	.5	UGL	ND	ND
GROSS ALPHA	17 NOV 81	1.58	PCL	ND	7.35
GROSS ALPHA	04 JAN 82	13.40	PCL		ND
GROSS BETA	17 NOV 81	1.30	PCL	3.46	80.60 *
GROSS BETA	04 JAN 82	1.30	PCL		87.40 *
TOTCOLBACT	18 NOV 81	1.	PHM	ND	616. *
TOTCOLBACT	01 DEC 81	1.	PHM		11. *
CHLORIDE	17 NOV 81	1.0	MGL	14.7	34.7
IRON	17 NOV 81	.03	MGL	.70 *	.13
MANGANESE	17 NOV 81	.01	MGL	.09 *	8.60 *
PHENOL	17 NOV 81	.01	MGL	.02	ND
SODIUM	17 NOV 81	1.	MGL	74.	42.
SULFATE	17 NOV 81	5.0	MGL	177.0	2170.0 *
PH(FIELD)	17 NOV 81		PH	7.4	6.9
PH(FIELD)	17 NOV 81		PH	7.4	6.8
PH(FIELD)	17 NOV 81		PH	7.4	6.9
PH(FIELD)	17 NOV 81		PH	7.3	6.9
PH(FIELD)	04 JAN 82		PH		6.7
PH(FIELD)	04 JAN 82		PH		6.7
PH(FIELD)	04 JAN 82		PH		6.7
PH(FIELD)	04 JAN 82		PH		6.7
SPEC COND	17 NOV 81	1.	UMC	820.	2400.
SPEC COND	17 NOV 81	1.	UMC	820.	2400.
SPEC COND	17 NOV 81	1.	UMC	820.	2400.
SPEC COND	17 NOV 81	1.	UMC	820.	2380.
TOC	17 NOV 81	1.0	MGL	15.8	10.4
TOC	17 NOV 81	1.0	MGL	16.1	8.4
TOC	17 NOV 81	1.0	MGL	16.2	9.0
TOC	17 NOV 81	1.0	MGL	16.0	9.3

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: AMMUNITION BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 3-5	3-7
TOX	17 NOV 81	10.	UGL	14.C	897.C
TOX	17 NOV 81	10.	UGL	11.C	885.C
TOX	17 NOV 81	10.	UGL	15.C	895.C
TOX	17 NOV 81	10.	UGL	19.C	862.C

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES; TRAILING ZEROES DO NOT ALWAYS INDICATE SIGNIFICANCE, BUT ARE THE RESULTS OF COMPUTER FORMATTING.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

C RESULTS ARE FOR UNFILTERED SAMPLE

SITE 5

Table VIII. Crane Naval Weapons Support Center. January 1985
Groundwater Sampling Project. Area 5-CERCLA - Inorganic

ATEC Lab No.	464-85	465-85	466-85
Well No.	5-1	5-2	5-3
Date Sampled	1/29/85	1/29/85	1/29/85
pH, Field, S.U.	6.8	7.2	7.6
Cond., Field, umho	430	450	50
Chloride, mg/l	1	<1	<1
Iron, ug/l	40	<20	140
Manganese, ug/l	370	<20	70
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	3.7	5.0	2.9
Sulfate, mg/l	26	9	17
TOC, mg/l	3.6	1.5	1.3
TOX, ug/l	<5.0	<5.0	<5.0
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	140	110	<50
Cadmium, ug/l	<0.4	<0.4	<0.4
Chromium, ug/l	<20	<20	<20
Lead, ug/l	<5	<5	<5
Mercury, ug/l	<0.3	<0.3	<0.3
Selenium, ug/l	<4	<4	<4
Silver, ug/l	<10	<10	<10

ATEC Lab No.	467-85	468-85	469-85
Well No.	5-5	5-6	5-7
Date Sampled	1/29/85	1/29/85	1/29/85
pH, Field, S.U.	7.4	7.0	7.5
Cond., Field, umho	290	600	700
Chloride, mg/l	<1	1	2
Iron, ug/l	<20	<20	<20
Manganese, ug/l	<50	1580	<20
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	1.9	29	34
Sulfate, mg/l	<5	55	110
TOC, mg/l	0.9	3.8	1.0
TOX, ug/l	<5.0	<5.0	<5.0
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	<50	90	70
Cadmium, ug/l	<0.4	<0.4	<0.4
Chromium, ug/l	<20	<20	<20
Lead, ug/l	5	<5	<5
Mercury, ug/l	<0.3	<0.3	<0.3
Selenium, ug/l	<4	<4	<4
Silver, ug/l	<10	<10	<10

Table VIII. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 5-CERCLA - Inorganic

ATEC Lab No.	470-85	471-85	472-85
Well No.	5-8	5-9	5-10
Date Sampled	1/29/85	1/29/85	1/29/85
pH, Field, S.U.	7.1	7.8	7.3
Cond., Field, umho	700	160	450
Chloride, mg/l	<1	<1	2
Iron, ug/l	<20	90	20
Manganese, ug/l	1380	20	<20
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	7.2	2.4	15
Sulfate, mg/l	13	<5	32
TOC, mg/l	5.6	2.4	1.5
TOX, ug/l	5.6	<5.0	36
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	280	60	150
Cadmium, ug/l	<0.4	<0.4	<0.4
Chromium, ug/l	<20	<20	<20
Lead, ug/l	<5	<5	<5
Mercury, ug/l	<0.3	<0.3	<0.3
Selenium, ug/l	<4	<4	<4
Silver, ug/l	<10	<10	<10

ATEC Lab No.	473-85	474-85	475-85
Well No.	5-11	5-12	5-13
Date Sampled	1/29/85	1/29/85	1/29/85
pH, Field, S.U.	7.3	7.4	7.3
Cond., Field, umho	530	520	420
Chloride, mg/l	<1	<1	<1
Iron, ug/l	310	20	20
Manganese, ug/l	60	20	20
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	12	12	6.8
Sulfate, mg/l	30	37	<5
TOC, mg/l	0.8	0.8	<0.5
TOX, ug/l	32	343	25
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	140	<50	<50
Cadmium, ug/l	<0.4	<0.4	<0.4
Chromium, ug/l	<20	<20	<20
Lead, ug/l	7	<5	<5
Mercury, ug/l	<0.3	<0.3	<0.3
Selenium, ug/l	<4	<4	<4
Silver, ug/l	<10	<10	<10

Table VIII. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 5-CERCLA- Inorganic

ATEC Lab No.	476-85	477-85	478-85
Well No.	5-14	5-15	5-16
Date Sampled	1/29/85	1/29/85	1/29/85
pH, Field, S.U.	7.4	7.1	7.5
Cond., Field, umho	320	430	250
Chloride, mg/l	1	1	1
Iron, ug/l	310	310	<20
Manganese, ug/l	300	2110	160
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	7.9	7.5	9.6
Sulfate, mg/l	<5	31	7
TOC, mg/l	4.2	1.1	0.9
TOX, ug/l	<5.0	11	<5.0
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	<50	130	130
Cadmium, ug/l	<0.4	<0.4	<0.4
Chromium, ug/l	<20	<20	<20
Lead, ug/l	<5	<5	<5
Mercury, ug/l	<0.3	<0.3	<0.3
Selenium, ug/l	<4	<4	<4
Silver, ug/l	<10	<10	<10

ATEC Lab No.	479-85	480-85	481-85
Well No.	5-17	5-18	5-19
Date Sampled	1/29/85	1/29/85	1/29/85
pH, Field, S.U.	7.5	7.3	7.2
Cond., Field, umho	350	260	400
Chloride, mg/l	3	<1	4
Iron, ug/l	240	5470	320
Manganese, ug/l	910	5070	320
Phenols, ug/l	<50	<50	<50
Sodium, mg/l	11	6.0	34
Sulfate, mg/l	<5	13	13
TOC, mg/l	1.0	1.2	1.5
TOX, ug/l	12	<5.0	<5.0
Arsenic, ug/l	<4	<4	<4
Barium, ug/l	130	220	90
Cadmium, ug/l	<0.4	<0.4	<0.4
Chromium, ug/l	<20	<20	<20
Lead, ug/l	<5	<5	<5
Mercury, ug/l	<0.3	<0.3	<0.3
Selenium, ug/l	<4	<4	<4
Silver, ug/l	<10	<10	<10

Table IX. Crane Naval Weapons Support Center. January 1985
Groundwater Sampling Project. Area 5-CERCLA - Organic

ATEC Lab No.	474-85
Well No.	5-12
Date Sampled	1/29/85
Acrolein	< 100
Acrylonitrile	< 100
Benzene	< 1.0
Bromoform	< 1.0
Carbon Tetrachloride	< 1.0
Chlorobenzene	< 1.0
Chlorodibromomethane	< 1.0
Chloroethane	< 10
2-Chloroethyl Vinyl Ether	< 1.0
Chloroform	< 1.0
Dichlorobromomethane	< 1.0
Dichlorodifluoromethane	< 10
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 1.0
1,1-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Ethyl Benzene	< 1.0
Methyl Bromide	< 10
Methyl Chloride	< 10
Methylene Chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 1.0
Toluene	< 1.0
trans-1,2-Dichloroethene	1890
1,1,1-Trichloroethane	< 1.0
1,1,2-Trichloroethane	< 1.0
Trichloroethene	262
Trichlorofluoromethane	< 1.0
Vinyl Chloride	< 10

All concentrations expressed as ug/l.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: OBP 5-1
ERG SAMPLE NO: 06/110454
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	420	umho/cm
pH, FIELD,	7.1	S.U.

CLIENT I.D.: OBP 5-2
ERG SAMPLE NO: 06/110455
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CONDUCTANCE, SPECIFIC	570	umho/cm
pH, FIELD,	7.0	S.U.

CLIENT I.D.: OBP 5-3
ERG SAMPLE NO: 06/110456
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	4	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.08	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	240	umho/cm
pH, FIELD,	6.7	S.U.

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: OBP 5-4
ERG SAMPLE NO: 06/110457
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	6	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	2.2	mg/L
ORGANIC BROMIDE	0.005	mg/L
ORGANIC IODINE	0.010	mg/L
CONDUCTANCE, SPECIFIC	800	umho/cm
pH, FIELD,	6.3	S.U.

CLIENT I.D.: OBP 5-5
ERG SAMPLE NO: 06/110458
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	420	umho/cm
pH, FIELD,	7.4	S.U.

CLIENT I.D.: OBP 5-6
ERG SAMPLE NO: 06/110459
MATRIX: GROUND WATER
DATE COLLECTED: 06-12-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.04	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	630	umho/cm
pH, FIELD,	7.6	S.U.

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: OBP 5-7
ERG SAMPLE NO: 06/110460
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CONDUCTANCE, SPECIFIC	800	umho/cm
pH, FIELD,	7.3	S.U.

CLIENT I.D.: OBP 5-8
ERG SAMPLE NO: 06/110461
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.07	mg/L
ORGANIC BROMIDE	0.002	mg/L
ORGANIC IODINE	0.059	mg/L
CONDUCTANCE, SPECIFIC	570	umho/cm
pH, FIELD,	7.1	S.U.

CLIENT I.D.: OBP 5-11
ERG SAMPLE NO: 06/110462
MATRIX: GROUND WATER
DATE COLLECTED: 06-12-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.05	mg/L
ORGANIC BROMIDE	ND 0.002	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	4490	umho/cm
pH, FIELD,	7.8	S.U.

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: OBP 5-12
ERG SAMPLE NO: 06/110463
MATRIX: GROUND WATER
DATE COLLECTED: 06-12-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.55	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CONDUCTANCE, SPECIFIC	550	umho/cm
pH, FIELD,	7.3	S.U.

CLIENT I.D.: OBP 5-13
ERG SAMPLE NO: 06/110464
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.21	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	530	umho/cm
pH, FIELD,	7.9	S.U.

CLIENT I.D.: OBP 5-17
ERG SAMPLE NO: 06/110465
MATRIX: GROUND WATER
DATE COLLECTED: 06-12-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.005	mg/L
CONDUCTANCE, SPECIFIC	360	umho/cm
pH, FIELD,	7.0	S.U.

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: OBP 5-19
ERG SAMPLE NO: 06/110466
MATRIX: GROUND WATER
DATE COLLECTED: 06-12-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CONDUCTANCE, SPECIFIC	630	umho/
pH, FIELD,	7.6	S.U.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

7777 EXCHANGE STREET
CLEVELAND, OHIO 44125 (216) 447-0790

PROJECT V6998.1
REPORT DATE 04-30-94

CLIENT P.O.: CLEVELAND
REPORT: 4759

SAMPLES RECVD: 02-10-94
REFER TECHNICAL QUESTIONS
TO: JAMES BOLGER

CLIENT:
COMMANDER
CRANE N.W.S.C.
CODE 0924 CATHY ANDREWS
CRANE, INDIANA 47522

ATTENTION: CATHY ANDREWS

APPROVED: _____

***
RESIDUAL SAMPLES WILL
BE HELD FOR TWO WEEKS
***

CLIENT I.D.: SMART REPORT
ERG SAMPLE NO: 02/102723
MATRIX: SPECIAL REPORTS
DATE COLLECTED: NG

PARAMETER	RESULTS	UNITS

CLIENT I.D.: OBP S-9:(A)
ERG SAMPLE NO: 02/102724
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-94

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	140	umho/cm
pH, FIELD,	6.2	S.U.
CHLORIDE	5	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	0.032	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	2.2	mg/L
SULFATE	24	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: OBP 5-1 (A)
ERG SAMPLE NO: 02/102479
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.05	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	350	umho/cm
pH, FIELD,	8.7	S.U.
CHLORIDE	2	mg/L
IRON, TOTAL	0.02	mg/L
MANGANESE, TOTAL	0.063	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	4.1	mg/L
SULFATE	18	mg/L

CLIENT I.D.: OBP 5-2 (A)
ERG SAMPLE NO: 02/102483
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: OBP 5-2 (A)
ERG SAMPLE NO: 02/102483
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
CONDUCTANCE, SPECIFIC	490	umho/cm
pH, FIELD,	6.6	S.U.
CHLORIDE	2	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	<0.005	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	4.2	mg/L
SULFATE	20	mg/L

CLIENT I.D.: OBP 5-4 (A)
ERG SAMPLE NO: 02/102487
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	1.0	mg/L
ORGANIC BROMIDE	0.009	mg/L
ORGANIC IODINE	0.010	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	920	umho/cm
pH, FIELD,	6.3	S.U.
CHLORIDE	110	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	0.026	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	44	mg/L
SULFATE	97	mg/L

CLIENT I.D.: OBP 5-5 (A)
ERG SAMPLE NO: 02/102491
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	380	umho/cm

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: OBP 5-5 (A)
ERG SAMPLE NO: 02/102491
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
pH, FIELD,	6.9	S.U.
CHLORIDE	2	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	0.007	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	2.6	mg/L
SULFATE	7	mg/L

CLIENT I.D.: OBP 5-6 (A)
ERG SAMPLE NO: 02/102495
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	2	mg/L
CONDUCTANCE, SPECIFIC	240	umho/cm
pH, FIELD,	7.1	S.U.
CHLORIDE	1	mg/L
IRON, TOTAL	0.02	mg/L
MANGANESE, TOTAL	0.15	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	2.5	mg/L
SULFATE	15	mg/L

CLIENT I.D.: OBP 5-7 (A)
ERG SAMPLE NO: 02/102499
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.003	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	710	umho/cm
pH, FIELD,	7.2	S.U.

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO: V6998 - COMMANDER 04-30-84

CLIENT I.D : CBP 5-7 (A)
ERG SAMPLE NO: 02/102499
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
CHLORIDE	2	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	1.7	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	28	mg/L
SULFATE	110	mg/L

CLIENT I.D.: CBP 5-8 (A)
ERG SAMPLE NO: 02/102503
MATRIX: NATURAL WATER
DATE COLLECTED: 02-04-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.07	mg/L
ORGANIC BROMIDE	0.007	mg/L
ORGANIC IODINE	0.15	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	730	umho/cr
pH, FIELD,	6.8	S.U.
CHLORIDE	13	mg/L
IRON, TOTAL	6	mg/L
MANGANESE, TOTAL	5.1	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	7.1	mg/L
SULFATE	12	mg/L

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
WATER LEVELS (A)	29 JUL 83		FT	589.4	577.9	578.3	575.9	576.4	561.7	565.9
PH(FIELD)	29 JUL 83		PH	7.1	6.4	6.4	6.8	5.9	7.6	7.4
PH(FIELD)	29 JUL 83		PH	7.1	6.5	6.4	6.9	5.9	7.6	7.3
PH(FIELD)	29 JUL 83		PH	7.1	6.4	6.4	6.8	5.9	7.7	7.3
PH(FIELD)	29 JUL 83		PH	7.1	6.3	6.5	6.8	6.0	7.6	7.4
SPEC COND	29 JUL 83	1.	UMC	670.	560.	220.	980.	560.	430.	770.
SPEC COND	29 JUL 83	1.	UMC	670.	560.	220.	980.	560.	430.	770.
SPEC COND	29 JUL 83	1.	UMC	680.	560.	220.	980.	560.	430.	770.
SPEC COND	29 JUL 83	1.	UMC	670.	560.	220.	970.	560.	430.	770.
TOC	29 JUL 83	1.0	MGL	62.0	53.0	18.0	50.0	49.0	38.0	49.0
TOC	29 JUL 83	1.0	MGL	61.0	54.0	19.0	51.0	49.0	38.0	50.0
TOC	29 JUL 83	1.0	MGL	62.0	53.0	19.0	50.0	48.0	37.0	49.0
TOC	29 JUL 83	1.0	MGL	61.0	54.0	18.0	51.0	50.0	37.0	50.0
TOX	29 JUL 83	.010	MGL	ND	ND	ND	1.140 C	.042 C	.019 C	ND
TOX	29 JUL 83	.010	MGL	.024 C	ND	ND	1.010 C	.037 C	.012 C	ND
TOX	29 JUL 83	.010	MGL	ND	ND	.020 C	1.250 C	.042 C	.014 C	ND
TOX	29 JUL 83	.010	MGL	ND	.025 C	ND	1.180 C	.034 C	.012 C	.019 C

Incl 9

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 5-8	
WATER LEVELS (A)	30 JUL 83		FT	559.7	
PH(FIELD)	30 JUL 83		PH	6.8	
PH(FIELD)	30 JUL 83		PH	6.8	
PH(FIELD)	30 JUL 83		PH	6.7	
PH(FIELD)	30 JUL 83		PH	6.8	
SPEC COND	30 JUL 83	1.	UMC	820.	
SPEC COND	30 JUL 83	1.	UMC	820.	
SPEC COND	30 JUL 83	1.	UMC	810.	
SPEC COND	30 JUL 83	1.	UMC	820.	
TOC	30 JUL 83	1.0	MGL	67.0	
TOC	30 JUL 83	1.0	MGL	67.0	
TOC	30 JUL 83	1.0	MGL	68.0	
TOC	30 JUL 83	1.0	MGL	66.0	
TOX	30 JUL 83	.010	MGL	.041	C
TOX	30 JUL 83	.010	MGL	.037	C
TOX	30 JUL 83	.010	MGL	.035	C
TOX	30 JUL 83	.010	MGL	.031	C

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN SITE: OLD BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 5-1 (BACKGROUND WELL)

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.450	559.250	14.125	.012
BACKGROUND STANDARD DEV	.245	169.079	14.660	.014
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	7.100	672.500	61.500	.010
CALCULATED STANDARD DEV	.000	5.000	.577	.009
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	5.199	1.312	6.332	-.301
ACCEPT TEST?	REJECT	OK	REJECT	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 5-2

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.450	559.250	14.125	.012
BACKGROUND STANDARD DEV	.245	169.079	14.660	.014
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.400	560.000	53.500	.010
CALCULATED STANDARD DEV	.082	.000	.577	.010
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	.396	.009	5.262	-.267
ACCEPT TEST?	OK	OK	REJECT	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 5-3

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.450	559.250	14.125	.012
BACKGROUND STANDARD DEV	.245	169.079	14.660	.014
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.425	220.000	18.500	.009
CALCULATED STANDARD DEV	.050	.000	.577	.007
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	.199	-3.932	.585	-.442
ACCEPT TEST?	OK	OK	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 5-4

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.450	559.250	14.125	.012
BACKGROUND STANDARD DEV	.245	169.079	14.660	.014
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.825	977.500	50.500	1.145
CALCULATED STANDARD DEV	.050	5.000	.577	.101
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	2.987	4.847	4.861	47.023
ACCEPT TEST?	REJECT	REJECT	REJECT	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 5-5

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.450	559.250	14.125	.012
BACKGROUND STANDARD DEV	.245	169.079	14.660	.014
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	5.925	560.000	49.000	.039
CALCULATED STANDARD DEV	.050	.000	.816	.004
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	4.182	.009	4.660	3.715
ACCEPT TEST?	REJECT	OK	REJECT	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 5-6

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.450	559.250	14.125	.012
BACKGROUND STANDARD DEV	.245	169.079	14.660	.014
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	7.625	430.000	37.500	.014
CALCULATED STANDARD DEV	.050	.000	.577	.003
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	9.359	-1.498	3.124	.313
ACCEPT TEST?	REJECT	OK	REJECT	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 5-7

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.450	559.250	14.125	.012
BACKGROUND STANDARD DEV	.245	169.079	14.660	.014
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	7.350	770.000	49.500	.008
CALCULATED STANDARD DEV	.058	.000	.577	.007
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	7.159	2.443	4.728	-.478
ACCEPT TEST?	REJECT	OK	REJECT	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 5-8

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.450	559.250	14.125	.012
BACKGROUND STANDARD DEV	.245	169.079	14.660	.014
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.775	817.500	67.000	.036
CALCULATED STANDARD DEV	.050	5.000	.816	.004
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	2.589	2.993	7.066	3.330
ACCEPT TEST?	OK	REJECT	REJECT	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

Incl 4

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
WATER LEVELS (A)	29 JUL 83		FT	589.4	577.9	578.3	575.9	576.4	561.7	565.9
PH(FIELD)	29 JUL 83		PH	7.1	6.4	6.4	6.8	5.9	7.6	7.4
PH(FIELD)	29 JUL 83		PH	7.1	6.4	6.4	6.8	5.9	7.7	7.3
PH(FIELD)	29 JUL 83		PH	7.1	6.3	6.5	6.8	6.0	7.6	7.4
PH(FIELD)	29 JUL 83		PH	7.1	6.5	6.4	6.9	5.9	7.6	7.3
SPEC COND	29 JUL 83	1.	UMC	670.	560.	220.	980.	560.	430.	770.
SPEC COND	29 JUL 83	1.	UMC	680.	560.	220.	980.	560.	430.	770.
SPEC COND	29 JUL 83	1.	UMC	670.	560.	220.	970.	560.	430.	770.
SPEC COND	29 JUL 83	1.	UMC	670.	560.	220.	980.	560.	430.	770.
TOC	29 JUL 83	1.0	MGL	61.0	54.0	19.0	51.0	49.0	38.0	50.0
TOC	29 JUL 83	1.0	MGL	62.0	53.0	18.0	50.0	49.0	38.0	49.0
TOC	29 JUL 83	1.0	MGL	61.0	53.0	19.0	50.0	48.0	37.0	49.0
TOC	29 JUL 83	1.0	MGL	62.0	54.0	18.0	51.0	50.0	37.0	50.0
TOX	29 JUL 83	.010	MGL	ND	ND	ND	1.180 C	.042 C	.019 C	ND
TOX	29 JUL 83	.010	MGL	ND	.025 C	.020 C	1.250 C	.034 C	.012 C	ND
TOX	29 JUL 83	.010	MGL	ND	ND	ND	1.010 C	.042 C	.014 C	.019 C
TOX	29 JUL 83	.010	MGL	.024 C	ND	ND	1.140 C	.037 C	.012 C	ND

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	5-8	
WATER LEVELS (A)	30 JUL 83		FT	559.7	
PH(FIELD)	30 JUL 83		PH	6.8	
PH(FIELD)	30 JUL 83		PH	6.7	
PH(FIELD)	30 JUL 83		PH	6.8	
PH(FIELD)	30 JUL 83		PH	6.8	
SPEC COND	30 JUL 83	1.	UMC	820.	
SPEC COND	30 JUL 83	1.	UMC	810.	
SPEC COND	30 JUL 83	1.	UMC	820.	
SPEC COND	30 JUL 83	1.	UMC	820.	
TOC	30 JUL 83	1.0	MGL	67.0	
TOC	30 JUL 83	1.0	MGL	67.0	
TOC	30 JUL 83	1.0	MGL	68.0	
TOC	30 JUL 83	1.0	MGL	66.0	
TOX	30 JUL 83	.010	MGL	.031	C
TOX	30 JUL 83	.010	MGL	.035	C
TOX	30 JUL 83	.010	MGL	.041	C
TOX	30 JUL 83	.010	MGL	.037	C

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
WATER LEVELS (A)	26 FEB 83		FT	592.7	578.8	578.0	576.2	577.8	562.9	567.7
CHLORIDE	26 FEB 83	1.0	MGL	ND	ND	ND	110.0	2.0	3.0	1.0
IRON	26 FEB 83	.03	MGL	ND	ND	ND	ND	ND	ND	ND
MANGANESE	26 FEB 83	.01	MGL	.28#	.01	.07#	.16#	ND	.68#	1.56#
PHENOL	26 FEB 83	.01	MGL	ND	ND	ND	ND	ND	ND	ND
SODIUM	26 FEB 83	1.	MGL	7.	6.	3.	47.	8.	27.	31.
SULFATE	26 FEB 83	5.0	MGL	23.0	11.0	15.0	120.0	20.0	32.0	130.0
PH(FIELD)	26 FEB 83		PH	6.7	6.4#	6.2#	6.1#	6.6	7.2	6.9
PH(FIELD)	26 FEB 83		PH	6.7	6.4#	6.2#	6.1#	6.7	7.2	7.0
PH(FIELD)	26 FEB 83		PH	6.7	6.5	6.2#	6.1#	6.7	7.1	7.0
PH(FIELD)	26 FEB 83		PH	6.7	6.4#	6.2#	6.1#	6.7	7.2	7.0
SPEC COND	26 FEB 83	1.	UMC	488.	540.	197.	765.	420.	500.	618.
SPEC COND	26 FEB 83	1.	UMC	488.	545.	195.	760.	420.	505.	620.
SPEC COND	26 FEB 83	1.	UMC	490.	540.	195.	760.	420.	505.	620.
SPEC COND	26 FEB 83	1.	UMC	485.	543.	197.	760.	418.	500.	615.
TOC	26 FEB 83	1.0	MGL	28.0	37.0	10.0	28.0	18.0	21.0	28.0
TOC	26 FEB 83	1.0	MGL	28.0	35.0	10.0	28.0	19.0	22.0	27.0
TOC	26 FEB 83	1.0	MGL	27.0	36.0	10.0	29.0	19.0	21.0	28.0
TOC	26 FEB 83	1.0	MGL	29.0	36.0	10.0	29.0	19.0	21.0	28.0
TOX	26 FEB 83	.010	MGL	ND	ND	.012 C	.016 C	ND	.018 C	.022 C
TOX	26 FEB 83	.010	MGL	ND	ND	.011 C	.020 C	ND	.012 C	.021 C
TOX	26 FEB 83	.010	MGL	ND	ND	.013 C	.021 C	ND	.020 C	ND
TOX	26 FEB 83	.010	MGL	ND	ND	.013 C	.020 C	ND	.018 C	.018 C

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	5-8	
WATER					
LEVELS (A)	26 FEB 83		FT	561.1	
CHLORIDE	26 FEB 83	1.0	MGL	13.0	
IRON	26 FEB 83	.03	MGL	2.60#	
MANGANESE	26 FEB 83	.01	MGL	3.80#	
PHENOL	26 FEB 83	.01	MGL	ND	
SODIUM	26 FEB 83	1.	MGL	10.	
SULFATE	26 FEB 83	5.0	MGL	ND	
PH(FIELD)	26 FEB 83		PH	6.8	
PH(FIELD)	26 FEB 83		PH	6.8	
PH(FIELD)	26 FEB 83		PH	6.8	
PH(FIELD)	26 FEB 83		PH	6.8	
SPEC COND	26 FEB 83	1.	UMC	795.	
SPEC COND	26 FEB 83	1.	UMC	800.	
SPEC COND	26 FEB 83	1.	UMC	800.	
SPEC COND	26 FEB 83	1.	UMC	795.	
TOC	26 FEB 83	1.0	MGL	42.0	
TOC	26 FEB 83	1.0	MGL	42.0	
TOC	26 FEB 83	1.0	MGL	42.0	
TOC	26 FEB 83	1.0	MGL	42.0	
TOX	26 FEB 83	.010	MGL	.045	C
TOX	26 FEB 83	.010	MGL	.048	C
TOX	26 FEB 83	.010	MGL	.050	C
TOX	26 FEB 83	.010	MGL	.068	C

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: OLD BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

B UPGRADIENT SITE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 5-15	5-16	5-17	5-18	5-19
BENZENE	13 JAN 83	1.	UGL	4.	23.			
BENZENE	10 FEB 83	1.	UGL			ND	ND	ND
CARBON TETRACHLORIDE	13 JAN 83	1.	UGL	ND	ND			
CARBON TETRACHLORIDE	10 FEB 83	1.	UGL			ND	ND	ND
CHLOROBENZENE	13 JAN 83	1.	UGL	ND	ND			
CHLOROBENZENE	10 FEB 83	1.	UGL			ND	ND	ND
1,2-DICHLOROETHANE	13 JAN 83	1.	UGL	ND	ND			
1,2-DICHLOROETHANE	10 FEB 83	1.	UGL			ND	ND	ND
1,1,1-TRICHLOROETHANE	13 JAN 83	1.	UGL	ND	ND			
1,1,1-TRICHLOROETHANE	10 FEB 83	1.	UGL			28.	19.	19.
1,1-DICHLOROETHANE	13 JAN 83	1.	UGL	ND	ND			
1,1-DICHLOROETHANE	10 FEB 83	1.	UGL			ND	ND	ND
1,1,2-TRICHLOROETHANE	13 JAN 83	1.	UGL	ND	ND			
1,1,2-TRICHLOROETHANE	10 FEB 83	1.	UGL			ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	13 JAN 83	1.	UGL	ND	ND			
1,1,2,2-TETRACHLOROETHANE	10 FEB 83	1.	UGL			ND	ND	ND
CHLOROETHANE	13 JAN 83	2.	UGL	ND	ND			
CHLOROETHANE	10 FEB 83	2.	UGL			ND	ND	ND
2-CHLOROETHYLVINYL ETHER	13 JAN 83	2.	UGL	ND	ND			
2-CHLOROETHYLVINYL ETHER	10 FEB 83	2.	UGL			ND	ND	ND
CHLOROFORM	13 JAN 83	1.	UGL	38.	ND			
CHLOROFORM	10 FEB 83	1.	UGL			3.	3.	3.
1,2-DICHLOROBENZENE	13 JAN 83	1.	UGL	ND	ND			
1,2-DICHLOROBENZENE	10 FEB 83	1.	UGL			ND	ND	ND
1,3-DICHLOROBENZENE	13 JAN 83	1.	UGL	ND	ND			
1,3-DICHLOROBENZENE	10 FEB 83	1.	UGL			ND	ND	ND
1,4-DICHLOROBENZENE	13 JAN 83	1.	UGL	ND	ND			
1,4-DICHLOROBENZENE	10 FEB 83	1.	UGL			ND	ND	ND
1,1-DICHLOROETHYLENE	13 JAN 83	1.	UGL	ND	ND			
1,1-DICHLOROETHYLENE	10 FEB 83	1.	UGL			ND	ND	ND
TRANS-1,2-DICHLOROETHYLENE	13 JAN 83	1.	UGL	ND	ND			
TRANS-1,2-DICHLOROETHYLENE	10 FEB 83	1.	UGL			30.	ND	2.
1,2-DICHLOROPROPANE	13 JAN 83	1.	UGL	ND	ND			
1,2-DICHLOROPROPANE	10 FEB 83	1.	UGL			ND	ND	ND
1,3-DICHLOROPROPENE	13 JAN 83	1.	UGL	ND	ND			
1,3-DICHLOROPROPENE	10 FEB 83	1.	UGL			ND	ND	ND
ETHYLBENZENE	13 JAN 83	1.	UGL	ND	ND			
ETHYLBENZENE	10 FEB 83	1.	UGL			ND	ND	ND
METHYLENE CHLORIDE	13 JAN 83	1.	UGL	ND	ND			
METHYLENE CHLORIDE	10 FEB 83	1.	UGL			8.	5.	5.
CHLOROMETHANE	13 JAN 83	2.	UGL	ND	ND			

RUN DATE: 17 MAR 83

INSTALLATION: CRANE NWSC, IN

FACILITY: NEW CRANE NWSC WELLS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 5-15	5-16	5-17	5-18	5-19
CHLOROMETHANE	10 FEB 83	2.	UGL			ND	ND	ND
BROMOMETHANE	13 JAN 83	2.	UGL	ND	ND			
BROMOMETHANE	10 FEB 83	2.	UGL			ND	ND	ND
BROMOFORM	13 JAN 83	2.	UGL	ND	ND			
BROMOFORM	10 FEB 83	2.	UGL			ND	ND	ND
BROMODICHLOROMETHANE	13 JAN 83	1.	UGL	ND	ND			
BROMODICHLOROMETHANE	10 FEB 83	1.	UGL			ND	ND	ND
TRICHLOROFLUOROMETHANE	13 JAN 83	1.	UGL	ND	ND			
TRICHLOROFLUOROMETHANE	10 FEB 83	1.	UGL			3.	2.	2.
DICHLOROFLUOROMETHANE	13 JAN 83	2.	UGL	ND	ND			
DICHLOROFLUOROMETHANE	10 FEB 83	2.	UGL			ND	ND	ND
DIBROMOCHLOROMETHANE	13 JAN 83	1.	UGL	ND	ND			
DIBROMOCHLOROMETHANE	10 FEB 83	1.	UGL			ND	ND	ND
TETRACHLOROETHYLENE	13 JAN 83	1.	UGL	ND	ND			
TETRACHLOROETHYLENE	10 FEB 83	1.	UGL			ND	ND	ND
TOLUENE	13 JAN 83	1.	UGL	ND	ND			
TOLUENE	10 FEB 83	1.	UGL			ND	ND	ND
TRICHLOROETHYLENE	13 JAN 83	1.	UGL	ND	ND			
TRICHLOROETHYLENE	10 FEB 83	1.	UGL			59.	33.	40.
VINYL CHLORIDE	13 JAN 83	1.	UGL	ND	ND			
VINYL CHLORIDE	10 FEB 83	1.	UGL			ND	ND	ND

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
WATER LEVELS (A)	27 SEP 82		FT	589.5	577.4	577.3	576.1	576.6	561.8	566.7
ARSENIC	28 SEP 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	28 SEP 82	.1	MGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	28 SEP 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	28 SEP 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
FLUORIDE	28 SEP 82	.10	MGL	.19	.11	ND	ND	.32	.13	.15
LEAD	28 SEP 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	28 SEP 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
NO2+NO3 AS N	28 SEP 82	.05	MGL	.09	2.00	.63	.18	.28	.05	.08
SELENIUM	28 SEP 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	28 SEP 82	.01	MGL	ND	ND	ND	ND	ND	ND	ND
ENDRIN	28 SEP 82	.04	UGL		ND		ND	ND	ND	ND
LINDANE	28 SEP 82	.08	UGL		ND		ND	ND	ND	ND
TOXAPHENE	28 SEP 82	1.6	UGL		ND		ND	ND	ND	ND
METHOXYCHLOR	28 SEP 82	1.6	UGL		ND		ND	ND	ND	ND
2,4-D	28 SEP 82	3.8	UGL	ND	ND		ND	ND	ND	ND
SILVEX	28 SEP 82	.5	UGL	ND	ND		ND	ND	ND	ND
GROSS ALPHA	28 SEP 82	1.60	PCL	1.81	ND	ND	2.12	ND	1.40	ND
RADIUM-226	21 AUG 82	.05	PCL					.68		
GROSS BETA	28 SEP 82	2.53	PCL	3.59	1.81	2.04	ND	5.52	ND	ND
CHLORIDE	28 SEP 82	1.0	MGL	ND	23.0	ND	57.4	2.0	ND	ND
IRON	28 SEP 82	.03	MGL	.53#	ND	.58#	.29	.24	.15	ND
MANGANESE	28 SEP 82	.01	MGL	.53#	ND	.06#	.33#	ND	.25#	1.34#
PHENOL	28 SEP 82	.01	MGL	.01	.01	.02	.03	ND	ND	ND
SODIUM	28 SEP 82	1.	MGL	24.	6.	3.	20.	12.	7.	26.
SULFATE	28 SEP 82	5.0	MGL	78.0	22.0	20.0	65.0	13.0	11.0	110.0
PH(FIELD)	28 SEP 82		PH	6.7	6.4#	6.8	6.4#	6.6	6.8	6.8
PH(FIELD)	28 SEP 82		PH	6.6	6.5	6.7	6.4#	6.7	7.0	6.8
PH(FIELD)	28 SEP 82		PH	6.7	6.4#	6.6	6.4#	6.7	7.0	6.8
PH(FIELD)	28 SEP 82		PH	6.7	6.4#	6.9	6.4#	6.7	7.0	6.8
SPEC COND	28 SEP 82	1.	UMC	815.	800.		860.	550.	400.	775.
SPEC COND	28 SEP 82	1.	UMC	815.	800.		860.	550.	400.	775.
SPEC COND	28 SEP 82	1.	UMC	810.	800.		860.	550.	400.	770.
SPEC COND	28 SEP 82	1.	UMC	815.	800.		860.	550.	400.	770.
TOC	28 SEP 82	1.0	MGL	2.0	22.0	6.0	28.0	27.0	3.0	27.0
TOC	28 SEP 82	1.0	MGL	2.0	23.0	6.0	27.0	26.0	3.0	27.0
TOC	28 SEP 82	1.0	MGL	2.0	22.0	6.0	27.0	27.0	2.0	28.0
TOC	28 SEP 82	1.0	MGL	2.0	23.0	6.0	27.0	27.0	3.0	29.0
TOX	28 SEP 82	.010	MGL	ND	ND	.049 C	.620 C	.011 C	ND	.033 C
TOX	28 SEP 82	.010	MGL	ND	ND	.053 C	.077 C	ND	ND	.014 C
TOX	28 SEP 82	.010	MGL	ND	ND	.060 C	.150 C	ND	.012 C	.029 C
TOX	28 SEP 82	.010	MGL	ND	ND	.068 C	.200 C	ND	ND	.028 C

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 5-8	
WATER LEVELS (A)	27 SEP 82		FT	561.3	
ARSENIC	28 SEP 82	.010	MGL	ND	
BARIUM	28 SEP 82	.1	MGL	ND	
CADMIUM	28 SEP 82	.005	MGL	ND	
CHROMIUM	28 SEP 82	.010	MGL	ND	
FLUORIDE	28 SEP 82	.10	MGL	.23	
LEAD	28 SEP 82	.010	MGL	.010	
MERCURY	28 SEP 82	.2	UGL	ND	
NO2+NO3 AS N	28 SEP 82	.05	MGL	ND	
SELENIUM	28 SEP 82	.005	MGL	ND	
SILVER	28 SEP 82	.01	MGL	ND	
ENDRIN	28 SEP 82	.04	UGL	ND	
LINDANE	28 SEP 82	.08	UGL	ND	
TOXAPHENE	28 SEP 82	1.6	UGL	ND	
METHOXYCHLOR	28 SEP 82	1.6	UGL	ND	
2,4-D	28 SEP 82	3.8	UGL	ND	
SILVEX	28 SEP 82	.5	UGL	ND	
GROSS ALPHA	28 SEP 82	1.30	PCL	2.95	
GROSS BETA	28 SEP 82	1.30	PCL	5.25	
CHLORIDE	28 SEP 82	1.0	MGL	5.0	
IRON	28 SEP 82	.03	MGL	2.73#	
MANGANESE	28 SEP 82	.01	MGL	.48#	
PHENOL	28 SEP 82	.01	MGL	ND	
SODIUM	28 SEP 82	1.	MGL	35.	
SULFATE	28 SEP 82	5.0	MGL	14.0	
PH(FIELD)	28 SEP 82		PH	6.4#	
PH(FIELD)	28 SEP 82		PH	6.4#	
PH(FIELD)	28 SEP 82		PH	6.4#	
PH(FIELD)	28 SEP 82		PH	6.5	
SPEC COND	28 SEP 82	1.	UMC	790.	
SPEC COND	28 SEP 82	1.	UMC	795.	
SPEC COND	28 SEP 82	1.	UMC	790.	
SPEC COND	28 SEP 82	1.	UMC	795.	
TOC	28 SEP 82	1.0	MGL	26.0	
TOC	28 SEP 82	1.0	MGL	24.0	
TOC	28 SEP 82	1.0	MGL	26.0	
TOC	28 SEP 82	1.0	MGL	25.0	
TOX	28 SEP 82	.010	MGL	.028	C
TOX	28 SEP 82	.010	MGL	ND	
TOX	28 SEP 82	.010	MGL	ND	
TOX	28 SEP 82	.010	MGL	.031	C

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
GROSS ALPHA	07 DEC 81	3.04	PCL	ND	ND	ND	ND	ND	ND	ND
GROSS ALPHA	13 APR 82	2.30	PCL	1.55	ND	ND	ND	ND	ND	ND
GROSS ALPHA	20 JUL 82	4.51	PCL	ND	ND		ND	11.00	ND	4.72
GROSS ALPHA	28 SEP 82	1.60	PCL	1.81	ND	ND	2.12	ND	1.40	ND
RADIUM-226	20 JUL 82	.05	PCL					.68		
RADIUM-226	21 AUG 82	.05	PCL					.68		
GROSS BETA	07 DEC 81	1.30	PCL	1.08	2.27	1.46	1.43	1.80	2.22	1.80
GROSS BETA	13 APR 82	1.63	PCL	ND	2.13	ND	1.40	2.23	2.83	1.20
GROSS BETA	20 JUL 82	1.86	PCL	2.46	3.43		3.23	4.98	1.71	ND
GROSS BETA	28 SEP 82	2.53	PCL	3.59	1.81	2.04	ND	5.52	ND	ND

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 5-8
GROSS ALPHA	07 DEC 81	1.30	PCL	9.83
GROSS ALPHA	13 APR 82	1.30	PCL	6.07
GROSS ALPHA	20 JUL 82	4.26	PCL	ND
GROSS ALPHA	28 SEP 82	1.30	PCL	2.95
GROSS BETA	07 DEC 81	1.30	PCL	7.88
GROSS BETA	13 APR 82	1.30	PCL	3.77
GROSS BETA	20 JUL 82	1.30	PCL	3.93
GROSS BETA	28 SEP 82	1.30	PCL	5.25

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND.

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 5-7	5-8	5-9	5-10	5-11	5-12	5-13
1,1,1-TRICHLOROETHANE	04 NOV 82	1.	UGL	ND	ND	2.	ND	ND	ND	ND
CHLOROFORM	04 NOV 82	1.	UGL	ND	ND	24.	9.	51.	70.	43.
TRANS-1,2-DICHLOROETHYLENE	04 NOV 82	1.	UGL	ND	ND	ND	23.	ND	1300.	ND
METHYLENE CHLORIDE	04 NOV 82	1.	UGL	ND	ND	4.	ND	ND	ND	7.
TRICHLOROFLUOROMETHANE	04 NOV 82	1.	UGL	ND	ND	1.	ND	ND	ND	ND
TETRACHLOROETHYLENE	04 NOV 82	1.	UGL	ND	ND	1.	ND	ND	ND	ND
TRICHLOROETHYLENE	04 NOV 82	1.	UGL	ND	ND	3.	40.	6.	480.	2.
VINYL CHLORIDE	04 NOV 82	1.	UGL	ND	ND	ND	ND	ND	2.	ND
1,1-DICHLOROETHYLENE	04 NOV 82	1.	UGL	ND	ND	ND	ND	ND	1.	ND

RUN DATE: 18 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND.

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 5-1	5-2	5-3	5-4	5-5	5-6
1,1,1-TRICHLOROETHANE	28 SEP 82	1.	UGL	ND	ND	ND	11.	ND	ND
1,1-DICHLOROETHYLENE	28 SEP 82	1.	UGL	ND	ND	ND	3.	ND	ND
TRANS-1,2-DICHLOROETHYLENE	28 SEP 82	1.	UGL	ND	ND	ND	3800.	ND	ND
TRICHLOROETHYLENE	28 SEP 82	1.	UGL	ND	57.	ND	3700.	ND	ND

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
WATER LEVELS (A)	19 JUL 82		FT	591.2	578.9	577.7	576.3	577.1	562.8	568.5
ARSENIC	20 JUL 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	20 JUL 82	.1	MGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	20 JUL 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	20 JUL 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
FLUORIDE	20 JUL 82	.10	MGL	.11	.15	ND	.10	.33	.17	.18
LEAD	20 JUL 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	20 JUL 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
NO2+NO3 AS N	20 JUL 82	.05	MGL	ND	.76	.79	.09	.10	.05	.10
SELENIUM	20 JUL 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	20 JUL 82	.01	MGL	ND	ND	ND	ND	ND	ND	ND
ENDRIN	20 JUL 82	.04	UGL	ND	ND	ND	ND	ND	ND	ND
LINDANE	20 JUL 82	.08	UGL	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	20 JUL 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	20 JUL 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
2,4-D	20 JUL 82	3.8	UGL	ND	ND	ND	ND	ND	ND	ND
SILVEX	20 JUL 82	.5	UGL	ND	ND	ND	ND	ND	ND	ND
GROSS ALPHA	20 JUL 82	4.51	PCL	ND	ND		ND	11.00	ND	4.72
GROSS BETA	20 JUL 82	1.86	PCL	2.46	3.43		3.23	4.98	1.71	ND
CHLORIDE	20 JUL 82	1.0	MGL	5.0	10.0	5.0	71.0	10.0	7.0	29.0
IRON	20 JUL 82	.03	MGL	ND	ND	.12	ND	.05	.20	.08
MANGANESE	20 JUL 82	.01	MGL	.13#	ND	.52#	.31#	ND	.12#	.49#
PHENOL	20 JUL 82	.01	MGL	.04	.01	.10	.09	.01	.06	.06
SODIUM	20 JUL 82	1.	MGL	208.	10.	6.	30.	13.	15.	31.
SULFATE	20 JUL 82	5.0	MGL	47.0	22.0	25.0	85.0	16.0	35.0	150.0
PH(FIELD)	20 JUL 82		PH	6.6	6.6	6.7	6.4#	6.6	6.9	6.9
PH(FIELD)	20 JUL 82		PH	6.6	6.5	6.8	6.4#	6.6	6.9	6.9
PH(FIELD)	20 JUL 82		PH	6.7	6.6	6.8	6.4#	6.6	7.0	6.9
PH(FIELD)	20 JUL 82		PH	6.7	6.5	6.8	6.4#	6.7	6.9	6.8
SPEC COND	20 JUL 82	1.	UMC	560.	540.	165.	760.	485.	450.	705.
SPEC COND	20 JUL 82	1.	UMC	565.	545.	166.	755.	490.	455.	705.
SPEC COND	20 JUL 82	1.	UMC	560.	540.	165.	755.	490.	450.	705.
SPEC COND	20 JUL 82	1.	UMC	560.	545.	163.	750.	485.	455.	710.
TOC	20 JUL 82	1.0	MGL	38.0	42.0	9.0	50.0	38.0	39.0	33.0
TOC	20 JUL 82	1.0	MGL	37.0	41.0	9.0	50.0	36.0	39.0	33.0
TOC	20 JUL 82	1.0	MGL	37.0	42.0	9.0	49.0	38.0	40.0	34.0
TOC	20 JUL 82	1.0	MGL	37.0	42.0	9.0	50.0	38.0	40.0	34.0
TOX	20 JUL 82	.010	MGL	ND	.023 C	.023 C	1.030 C	.035 C	.024 C	.030 C
TOX	20 JUL 82	.010	MGL	ND	.023 C	.012 C	.970 C	.030 C	ND	ND
TOX	20 JUL 82	.010	MGL	ND	.022 C	.022 C	1.010 C	.033 C	.012 C	.018 C
TOX	20 JUL 82	.010	MGL	ND	.022 C	.017 C	1.000 C	.029 C	ND	.017 C

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

SAMPLING SITES
RESULTS

5-8

LEVELS NO WATER LEVEL INFORMATION AVAILABLE FOR 418173 OLD BURNING GROUND FOR ABOVE WELLS FROM 82150 TO 82365

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS		
ARSENIC	20 JUL 82	.010	MGL	ND	
BARIUM	20 JUL 82	.1	MGL	ND	
CADMIUM	20 JUL 82	.005	MGL	ND	
CHROMIUM	20 JUL 82	.010	MGL	ND	
FLUORIDE	20 JUL 82	.10	MGL	.23	
LEAD	20 JUL 82	.010	MGL	ND	
MERCURY	20 JUL 82	.2	UGL	ND	
NO2+NO3 AS N	20 JUL 82	.05	MGL	ND	
SELENIUM	20 JUL 82	.005	MGL	ND	
SILVER	20 JUL 82	.01	MGL	ND	
ENDRIN	20 JUL 82	.04	UGL	ND	
LINDANE	20 JUL 82	.08	UGL	ND	
TOXAPHENE	20 JUL 82	1.6	UGL	ND	
METHOXYCHLOR	20 JUL 82	1.6	UGL	ND	
2,4-D	20 JUL 82	3.8	UGL	ND	
SILVEX	20 JUL 82	.5	UGL	ND	
GROSS ALPHA	20 JUL 82	4.26	PCL	ND	
GROSS BETA	20 JUL 82	1.30	PCL	3.93	
CHLORIDE	20 JUL 82	1.0	MGL	15.0	
IRON	20 JUL 82	.03	MGL	3.40#	
MANGANESE	20 JUL 82	.01	MGL	2.38#	
PHENOL	20 JUL 82	.01	MGL	ND	
SODIUM	20 JUL 82	1.	MGL	53.	
SULFATE	20 JUL 82	5.0	MGL	24.0	
PH(FIELD)	20 JUL 82		PH	6.5	
PH(FIELD)	20 JUL 82		PH	6.5	
PH(FIELD)	20 JUL 82		PH	6.5	
PH(FIELD)	20 JUL 82		PH	6.5	
SPEC COND	20 JUL 82	1.	UMC	680.	
SPEC COND	20 JUL 82	1.	UMC	685.	
SPEC COND	20 JUL 82	1.	UMC	690.	
SPEC COND	20 JUL 82	1.	UMC	685.	
TOC	20 JUL 82	1.0	MGL	62.0	
TOC	20 JUL 82	1.0	MGL	61.0	
TOC	20 JUL 82	1.0	MGL	62.0	
TOC	20 JUL 82	1.0	MGL	62.0	
TOX	20 JUL 82	.010	MGL	ND	
TOX	20 JUL 82	.010	MGL	.015	C
TOX	20 JUL 82	.010	MGL	.014	C
TOX	20 JUL 82	.010	MGL	.032	C

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

CRANE NWSC

Results of Analysis for Purgeable Organic Priority Pollutants

Samples Taken 19 Apr 83

Results in ug/L

	5-15	5-17	5-18	5-19
trans-1,2-Dichloroethylene	8	22	ND	ND
Trichloroethylene	ND	15	ND	ND

ND - Compound not detected

Analysis by Gas Chromatography; Wells 5-15 and 5-17 results confirmed by Mass Spectrometry.

Incl 11

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
WATER LEVELS (A)	13 APR 82		FT	594.0	579.4	579.8	578.1	578.3	562.8	567.7
ARSENIC	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	13 APR 82	.1	MGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	13 APR 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
FLUORIDE	13 APR 82	.10	MGL	.11	.14	ND	.10	.41	.21	.20
LEAD	13 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	13 APR 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
NO2+NO3 AS N	13 APR 82	.05	MGL	ND	1.00	1.00	.08	.55	.08	ND
SELENIUM	13 APR 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	13 APR 82	.01	MGL	ND	ND	ND	ND	ND	ND	ND
ENDRIN	13 APR 82	.04	UGL	ND	ND	ND	ND	ND	ND	ND
LINDANE	13 APR 82	.08	UGL	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	13 APR 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	13 APR 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
2,4-D	13 APR 82	3.8	UGL	ND	ND	ND	ND	ND	ND	ND
SILVEX	13 APR 82	.5	MGL	ND	ND	ND	ND	ND	ND	ND
GROSS ALPHA	13 APR 82	2.30	PCL	1.55	ND	ND	ND	ND	ND	ND
GROSS BETA	13 APR 82	1.63	PCL	ND	2.13	ND	1.40	2.23	2.83	1.20
CHLORIDE	13 APR 82	1.0	MGL	9.0	20.0	11.0	74.0	12.0	11.0	10.0
IRON	13 APR 82	.03	MGL	.76#	.26	1.01#	.51#	.32#	.14	ND
MANGANESE	13 APR 82	.01	MGL	.99#	ND	.77#	.50#	.02	ND	.38#
PHENOL	13 APR 82	.01	MGL	ND	ND	ND	ND	ND	ND	ND
SODIUM	13 APR 82	1.	MGL	3.	17.	2.	31.	18.	54.	30.
SULFATE	13 APR 82	5.0	MGL	24.0	21.0	20.0	74.0	11.0	90.0	120.0
PH(FIELD)	13 APR 82		PH	6.1#	6.1#	5.9#	6.1#	6.4#	6.7	6.6
PH(FIELD)	13 APR 82		PH	6.1#	6.1#	5.9#	6.1#	6.4#	6.7	6.6
PH(FIELD)	13 APR 82		PH	6.1#	6.1#	5.9#	6.1#	6.4#	6.6	6.5
PH(FIELD)	13 APR 82		PH	6.1#	6.1#	5.9#	6.1#	6.4#	6.7	6.6
SPEC COND	13 APR 82	1.	UMC	364.	560.	127.	850.	340.	609.	749.
SPEC COND	13 APR 82	1.	UMC	362.	560.	127.	850.	339.	609.	748.
SPEC COND	13 APR 82	1.	UMC	362.	560.	127.	850.	339.	609.	750.
SPEC COND	13 APR 82	1.	UMC	360.	560.	127.	850.	339.	610.	748.
TOC	13 APR 82	1.0	MGL	14.0	30.0	8.0	24.0	14.0	25.0	33.0
TOC	13 APR 82	1.0	MGL	14.0	30.0	8.0	24.0	13.0	25.0	34.0
TOC	13 APR 82	1.0	MGL	15.0	30.0	8.0	25.0	14.0	25.0	33.0
TOC	13 APR 82	1.0	MGL	14.0	32.0	8.0	24.0	14.0	25.0	34.0
TOX	13 APR 82	.010	MGL	.011 C	.013 C	.024 C	1.620 C	.013 C	.021 C	.014 C
TOX	13 APR 82	.010	MGL	ND	.011 C	.023 C	1.220 C	.013 C	.020 C	.015 C
TOX	13 APR 82	.010	MGL	ND	ND	.014 C	1.420 C	ND	.033 C	ND
TOX	13 APR 82	.010	MGL	ND	.010 C	.022 C	1.370 C	.012 C	.026 C	.015 C

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN

FACILITY: OLD BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	5-8	
WATER LEVELS (A)	13 APR 82		FT	561.8	
ARSENIC	13 APR 82	.010	MGL	ND	
BARIUM	13 APR 82	.1	MGL	ND	
CADMIUM	13 APR 82	.005	MGL	ND	
CHROMIUM	13 APR 82	.010	MGL	ND	
FLUORIDE	13 APR 82	.10	MGL	.26	
LEAD	13 APR 82	.010	MGL	.010	
MERCURY	13 APR 82	.2	UGL	ND	
NO2+NO3 AS N	13 APR 82	.05	MGL	ND	
SELENIUM	13 APR 82	.005	MGL	ND	
SILVER	13 APR 82	.01	MGL	.05	
ENDRIN	13 APR 82	.04	UGL	ND	
LINDANE	13 APR 82	.08	UGL	ND	
TOXAPHENE	13 APR 82	1.6	UGL	ND	
METHOXYCHLOR	13 APR 82	1.6	UGL	ND	
2,4-D	13 APR 82	3.8	UGL	ND	
SILVEX	13 APR 82	.5	MGL	ND	
GROSS ALPHA	13 APR 82	1.30	PCL	6.07	
GROSS BETA	13 APR 82	1.30	PCL	3.77	
CHLORIDE	13 APR 82	1.0	MGL	20.0	
IRON	13 APR 82	.03	MGL	2.95#	
MANGANESE	13 APR 82	.01	MGL	4.30#	
PHENOL	13 APR 82	.01	MGL	ND	
SODIUM	13 APR 82	1.	MGL	66.	
SULFATE	13 APR 82	5.0	MGL	21.0	
PH(FIELD)	13 APR 82		PH	6.5	
PH(FIELD)	13 APR 82		PH	6.5	
PH(FIELD)	13 APR 82		PH	6.5	
PH(FIELD)	13 APR 82		PH	6.5	
SPEC COND	13 APR 82	1.	UMC	849.	
SPEC COND	13 APR 82	1.	UMC	850.	
SPEC COND	13 APR 82	1.	UMC	851.	
SPEC COND	13 APR 82	1.	UMC	850.	
TOC	13 APR 82	1.0	MGL	73.0	
TOC	13 APR 82	1.0	MGL	74.0	
TOC	13 APR 82	1.0	MGL	74.0	
TOC	13 APR 82	1.0	MGL	73.0	
TOX	13 APR 82	.010	MGL	.031	C
TOX	13 APR 82	.010	MGL	.026	C
TOX	13 APR 82	.010	MGL	.029	C
TOX	13 APR 82	.010	MGL	.026	C

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN FACILITY: OLD BURNING GROUND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
WATER										
LEVELS A	13 DEC 81		FT	591.62	575.63	576.08	573.63	574.38	560.57	566.40
ARSENIC	07 DEC 81	.010	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	07 DEC 81	.1	MGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	07 DEC 81	.005	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	07 DEC 81	.010	MGL	ND	ND	ND	ND	ND	ND	ND
FLUORIDE	07 DEC 81	.10	MGL	.15	.12	ND	ND	.19	.18	.24
LEAD	07 DEC 81	.010	MGL	ND	ND	.015	ND	ND	ND	ND
MERCURY	07 DEC 81	.2	UGL	ND	ND	ND	ND	ND	.2	ND
NO2+NO3 AS N	07 DEC 81	.05	MGL	.03	1.10	.26	.10	.52	ND	ND
SELENIUM	07 DEC 81	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	07 DEC 81	.01	MGL	ND	.05	ND	ND	ND	ND	ND
ENDRIN	07 DEC 81	.04	UGL	ND	ND	ND	ND	ND	ND	ND
LINDANE	07 DEC 81	.08	UGL	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	07 DEC 81	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	07 DEC 81	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
2,4-D	07 DEC 81	3.8	UGL	ND	ND	ND	ND	ND	ND	ND
SILVEX	07 DEC 81	.5	UGL	ND	ND	ND	ND	ND	ND	ND
GROSS ALPHA	07 DEC 81	1.30	PCL	ND	ND	ND	ND	ND	ND	ND
GROSS BETA	07 DEC 81	1.30	PCL	1.08	2.27	1.46	1.43	1.80	2.22	1.80
TOTCOLBACT	08 DEC 81	1.	PHM	ND	240.*	ND	1.	ND	ND	87.*
CHLORIDE	07 DEC 81	1.0	MGL	1.9	18.6	3.8	97.4	5.7	4.0	4.5
IRON	07 DEC 81	.03	MGL	4.44 *	ND	2.85 *	.25	ND	ND	ND
MANGANESE	07 DEC 81	.01	MGL	2.04 *	1.17 *	.12 *	1.40 *	.06 *	.22 *	.36 *
PHENOL	07 DEC 81	.01	MGL	ND	ND	ND	ND	ND	ND	ND
SODIUM	07 DEC 81	1.	MGL	9.	16.	10.	44.	18.	12.	37.
SULFATE	07 DEC 81	5.0	MGL	27.4	42.4	24.2	96.8	22.7	17.8	127.0
PH(FIELD)	07 DEC 81		PH	6.4 *	6.8	6.1 *	6.4 *	6.6	7.0	7.2
PH(FIELD)	07 DEC 81		PH	6.3 *	6.8	6.1 *	6.4 *	6.6	6.9	7.2
PH(FIELD)	07 DEC 81		PH	6.4 *	6.8	6.1 *	6.5	6.6	7.0	7.1
PH(FIELD)	07 DEC 81		PH	6.4 *	6.8	6.1 *	6.4 *	6.7	7.0	7.2
SPEC COND	07 DEC 81	1.	UMC	500.	800.	135.	990.	490.	460.	720.
SPEC COND	07 DEC 81	1.	UMC	500.	800.	135.	990.	480.	480.	720.
SPEC COND	07 DEC 81	1.	UMC	500.	800.	135.	990.	490.	480.	730.
SPEC COND	07 DEC 81	1.	UMC	500.	800.	135.	990.	490.	480.	720.
TOC	07 DEC 81	1.0	MGL	3.0	17.0	12.0	5.0	3.0	2.0	3.0
TOC	07 DEC 81	1.0	MGL	3.0	16.0	12.0	4.0	3.0	3.0	3.0
TOC	07 DEC 81	1.0	MGL	3.0	17.0	11.0	4.0	3.0	3.0	3.0
TOC	07 DEC 81	1.0	MGL	3.0	16.0	12.0	5.0	3.0	2.0	3.0

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS B 5-1	5-2	5-3	5-4	5-5	5-6	5-7
TOX	07 DEC 81	10.	UGL	15.C	25.C	11.C	1171.C	18.C	ND	ND
TOX	07 DEC 81	10.	UGL	50.C	25.C	16.C	1225.C	17.C	ND	11.C
TOX	07 DEC 81	10.	UGL	45.C	43.C	15.C	1188.C	21.C	ND	12.C
TOX	07 DEC 81	10.	UGL	15.C	20.C	16.C	1352.C	16.C	26.C	12.C

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES; TRAILING ZEROES DO NOT ALWAYS INDICATE SIGNIFICANCE, BUT ARE THE RESULTS OF COMPUTER FORMATTING.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

C RESULTS ARE FOR UNFILTERED SAMPLE

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: OLD BURNING GROUND

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 5-8
WATER LEVELS A	13 DEC 81		FT	560.48
ARSENIC	07 DEC 81	.010	MGL	ND
BARIUM	07 DEC 81	.1	MGL	ND
CADMIUM	07 DEC 81	.005	MGL	ND
CHROMIUM	07 DEC 81	.010	MGL	.010
FLUORIDE	07 DEC 81	.10	MGL	.24
LEAD	07 DEC 81	.010	MGL	ND
MERCURY	07 DEC 81	.2	UGL	ND
NO2+NO3 AS N	07 DEC 81	.05	MGL	.08
SELENIUM	07 DEC 81	.005	MGL	ND
SILVER	07 DEC 81	.01	MGL	ND
ENDRIN	07 DEC 81	.04	UGL	ND
LINDANE	07 DEC 81	.08	UGL	ND
TOXAPHENE	07 DEC 81	1.6	UGL	ND
METHOXYCHLOR	07 DEC 81	1.6	UGL	ND
2,4-D	07 DEC 81	3.8	UGL	ND
SILVEX	07 DEC 81	.5	UGL	ND
GROSS ALPHA	07 DEC 81	1.30	PCL	9.83
GROSS BETA	07 DEC 81	1.30	PCL	7.88
TOTCOLBACT	08 DEC 81	1.	PHM	ND
CHLORIDE	07 DEC 81	1.0	MGL	15.3
IRON	07 DEC 81	.03	MGL	10.80*
MANGANESE	07 DEC 81	.01	MGL	1.52*
PHENOL	07 DEC 81	.01	MGL	ND
SODIUM	07 DEC 81	1.	MGL	54.
SULFATE	07 DEC 81	5.0	MGL	39.2
PH(FIELD)	07 DEC 81		PH	6.7
PH(FIELD)	07 DEC 81		PH	6.7
PH(FIELD)	07 DEC 81		PH	6.7
PH(FIELD)	07 DEC 81		PH	6.7
SPEC COND	07 DEC 81	1.	UMC	670.
SPEC COND	07 DEC 81	1.	UMC	660.
SPEC COND	07 DEC 81	1.	UMC	670.
SPEC COND	07 DEC 81	1.	UMC	660.
TOC	07 DEC 81	1.0	MGL	6.0
TOC	07 DEC 81	1.0	MGL	5.0
TOC	07 DEC 81	1.0	MGL	4.0
TOC	07 DEC 81	1.0	MGL	4.0

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: OLD BURNING GROUND

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	5-8
TOX	07 DEC 81	10.	UGL	ND
TOX	07 DEC 81	10.	UGL	11.C
TOX	07 DEC 81	10.	UGL	ND
TOX	07 DEC 81	10.	UGL	ND

LEGEND
NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES; TRAILING ZEROES DO NOT ALWAYS INDICATE SIGNIFICANCE, BUT ARE THE RESULTS OF COMPUTER FORMATTING.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE

SITE 9

Table XIII. Crane Naval Weapons Support Center. January 1985
Groundwater Sampling Project. Area 9-CERCLA - Inorganic

ATEC Lab No.	306-85	307-85	308-85	309-85
Well No.	9-1	9-2	9-3	9-4
Date Sampled	1/16/85	1/16/85	1/16/85	1/16/85
pH Lab, S.U.	7.5	6.6	6.8	7.1
Cond., Field, umho	800	830	810	1100
Chloride, mg/l	<1	<1	<1	<1
Iron, ug/l	80	21,300	130	540
Manganese, ug/l	380	25,800	410	2120
Phenols, ug/l	<50	<50	<50	<50
Sodium, mg/l	16	14	24	14
Sulfate, mg/l	130	78	110	100
TOC, mg/l	10	8.2	5.6	2.4
TOX, ug/l	<5.0	19	553	31
Cond. Lab, umho	460	435	560	690

ATEC Lab No.	310-85	311-85	312-85	313-85
Well No.	9-5	9-6	9-7	9-8
Date Sampled	1/16/85	1/16/85	1/16/85	1/16/85
pH Lab, S.U.	7.1	6.4	6.7	7.2
Cond., Field, umho	1160	900	2000	1150
Chloride, mg/l	<1	<1	<1	1
Iron, ug/l	40	2820	230	230
Manganese, ug/l	1980	1020	530	1230
Phenols, ug/l	<50	<50	<50	<50
Sodium, mg/l	41	42	100	55
Sulfate, mg/l	210	190	610	110
TOC, mg/l	3.0	3.9	5.0	7.6
TOX, ug/l	27	<5.0	9.4	19
Cond. Lab, umho	780	570	1350	750

Table XIII. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 9-CERCLA - Inorganic

ATEC Lab No.	314-85	315-85	316-85	317-85
Well No.	9-9	9-10	9-11	9-12
Date Sampled	1/16/85	1/16/85	1/16/85	1/16/85
pH Lab, S.U.	6.4	7.2	7.4	7.1
Cond., Field, umho	1230	1200	790	1120
Chloride, mg/l	<1	<1	1	<1
Iron, ug/l	190	120	80	360
Manganese, ug/l	17,100	1050	150	2160
Phenols, ug/l	<50	<50	<50	<50
Sodium, mg/l	65	34	19	39
Sulfate, mg/l	320	84	55	230
TOC, mg/l	4.4	6.4	2.7	2.1
TOX, ug/l	49	12	14	<5.0
Cond. Lab, umho	880	750	540	770

ATEC Lab No.	318-85
Well No.	9-13
Date Sampled	1/16/85
pH Lab, S.U.	7.7
Cond., Field, umho	750
Chloride, mg/l	2
Iron, ug/l	20
Manganese, ug/l	950
Phenols, ug/l	<50
Sodium, mg/l	25
Sulfate, mg/l	150
TOC, mg/l	3.6
TOX, ug/l	<5.0
Cond. Lab, umho	570

Table XIV. Crane Naval Weapons Support Center. January 1985
Groundwater Sampling Project. Area 9-CERCLA - Organic

ATEC Lab No.	306-85	308-85	309-85
Well No.	9-1	9-3	9-4
Date Sampled	1/16/85	1/16/85	1/16/85
Acrolein	< 100	< 100	< 100
Acrylonitrile	< 100	< 100	< 100
Benzene	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	< 1.0	< 1.0	< 1.0
Chloroethane	< 10	< 10	< 10
2-Chloroethyl Vinyl Ether	< 1.0	< 1.0	< 1.0
Chloroform	< 1.0	< 1.0	< 1.0
Dichlorobromomethane	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane	< 10	< 10	< 10
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0
Ethyl Benzene	< 1.0	< 1.0	< 1.0
Methyl Bromide	< 10	< 10	< 10
Methyl Chloride	< 10	< 10	< 10
Methylene Chloride	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0
Toluene	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	< 1.0	114	11.3
1,1,1-Trichloroethane	< 1.0	39	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0
Trichloroethene	1.0	55.3	2.9
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0
Vinyl Chloride	< 10	< 10	< 10

All concentrations expressed as ug/l.

Table XIV. Crane Naval Weapons Support Center. January 1985
(Cont'd.) Groundwater Sampling Project. Area 9-CERCLA - Organic

ATEC Lab No.	312-85
Well No.	9-7
Date Sampled	1/16/85
Acrolein	< 100
Acrylonitrile	< 100
Benzene	< 1.0
Bromoform	< 1.0
Carbon Tetrachloride	< 1.0
Chlorobenzene	< 1.0
Chlorodibromomethane	< 1.0
Chloroethane	< 10
2-Chloroethyl Vinyl Ether	< 1.0
Chloroform	< 1.0
Dichlorobromomethane	< 1.0
Dichlorodifluoromethane	< 10
1,1-Dichloroethane	< 1.0
1,2-Dichloroethane	< 1.0
1,1-Dichloroethene	< 1.0
1,2-Dichloropropane	< 1.0
cis-1,3-Dichloropropene	< 1.0
trans-1,3-Dichloropropene	< 1.0
Ethyl Benzene	< 1.0
Methyl Bromide	< 10
Methyl Chloride	< 10
Methylene Chloride	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0
Tetrachloroethene	< 1.0
Toluene	< 1.0
trans-1,2-Dichloroethene	< 1.0
1,1,1-Trichloroethane	< 1.0
1,1,2-Trichloroethane	< 1.0
Trichloroethene	< 1.0
Trichlorofluoromethane	< 1.0
Vinyl Chloride	< 10

All concentrations expressed as ug/l.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: PCA 9-1
ERG SAMPLE NO: 06/110436
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	530	umho/c
pH, FIELD,	7.5	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-2
ERG SAMPLE NO: 06/110437
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	7	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.06	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.28	mg/L
CONDUCTANCE, SPECIFIC	460	umho/c
pH, FIELD,	6.6	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: PCA 9-1
ERG SAMPLE NO: 06/110436
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	530	umho/cm
pH, FIELD,	7.5	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-2
ERG SAMPLE NO: 06/110437
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	7	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.06	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.28	mg/L
CONDUCTANCE, SPECIFIC	460	umho/cm
pH, FIELD,	6.6	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: PCA 9-2
ERG SAMPLE NO: 06/110437
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-3
ERG SAMPLE NO: 06/110438
MATRIX: GROUND WATER
DATE COLLECTED: 06-11-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	6	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.27	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.015	mg/L
CONDUCTANCE, SPECIFIC	530	umho/cm
pH, FIELD,	6.7	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-4
ERG SAMPLE NO: 06/110439
MATRIX: GROUND WATER
DATE COLLECTED: 06-11-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	5	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.04	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.015	mg/L
CONDUCTANCE, SPECIFIC	790	umho/cm
pH, FIELD,	6.8	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: PCA 9-4
ERG SAMPLE NO: 06/110439
MATRIX: GROUND WATER
DATE COLLECTED: 06-11-84

PARAMETER	RESULTS	UNITS
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-5
ERG SAMPLE NO: 06/110440
MATRIX: GROUND WATER
DATE COLLECTED: 06-11-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	4	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.028	mg/L
CONDUCTANCE, SPECIFIC	630	umho/cm
pH, FIELD,	6.7	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-6
ERG SAMPLE NO: 06/110441
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.004	mg/L
CONDUCTANCE, SPECIFIC	780	umho/cm
pH, FIELD,	6.1	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: PCA 9-6
ERG SAMPLE NO: 06/110441
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-7
ERG SAMPLE NO: 06/110442
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.027	mg/L
CONDUCTANCE, SPECIFIC	1400	umho/cm
pH, FIELD,	6.7	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-8
ERG SAMPLE NO: 06/110443
MATRIX: GROUND WATER
DATE COLLECTED: 06-11-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	3	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.012	mg/L
CONDUCTANCE, SPECIFIC	760	umho/cm
pH, FIELD,	7.0	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

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 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER 07-24-84

CLIENT I.D.: PCA 9-9
ERG SAMPLE NO: 06/110444
MATRIX: GROUND WATER
DATE COLLECTED: 06-08-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	4	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	0.007	mg/L
ORGANIC IODINE	0.021	mg/L
CONDUCTANCE, SPECIFIC	900	umho/cm
pH, FIELD,	6.5	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-11
ERG SAMPLE NO: 06/110445
MATRIX: GROUND WATER
DATE COLLECTED: 06-12-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	4	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.028	mg/L
CONDUCTANCE, SPECIFIC	530	umho/cm
pH, FIELD,	7.2	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

CLIENT I.D.: PCA 9-13
ERG SAMPLE NO: 06/110446
MATRIX: GROUND WATER
DATE COLLECTED: 06-12-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	5	mg/L

CONTINUED

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ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: PCA 9-13
ERG SAMPLE NO: 06/110446
MATRIX: GROUND WATER
DATE COLLECTED: 06-12-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.14	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.037	mg/L
CONDUCTANCE, SPECIFIC	480	umho/cm
pH, FIELD,	7.2	S.U.
PCB		
TOTAL PCB	ND (0.20)	ug/L
PCB 1242	ND (0.20)	ug/L
PCB 1248	ND (0.20)	ug/L
PCB 1254	ND (0.20)	ug/L
PCB 1260	ND (0.20)	ug/L

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998.1 - COMMANDER 04-30-8

CLIENT I.D. PCA 9-1 (A)
ERG SAMPLE NO: 02/102788
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	480	umho/cm
pH, FIELD,	7.0	S.U.
CHLORIDE	1	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	ND (0.005)	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	22	mg/L
SULFATE	49	mg/L

CLIENT I.D. PCA 9-4 (A)
ERG SAMPLE NO: 02/102792
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.24	mg/L
ORGANIC BROMIDE	0.007	mg/L
ORGANIC IODINE	0.039	mg/L
CARBON, TOTAL ORGANIC,	3	mg/L
CONDUCTANCE, SPECIFIC	870	umho/cm
pH, FIELD,	6.3	S.U.
CHLORIDE	28	mg/L
IRON, TOTAL	0.20	mg/L
MANGANESE, TOTAL	0.90	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	20	mg/L
SULFATE	120	mg/L

CLIENT I.D. PCA 9-5 (A)
ERG SAMPLE NO: 02/102796
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.001)	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998.1 - COMMANDER 04-30-8

CLIENT I.D.: PCA 9-5 (A)
ERG SAMPLE NO: 02/102796
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-84

PARAMETER	RESULTS	UNITS
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.014	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	830	umho/cm
pH, FIELD,	6.6	S.U.
CHLORIDE	23	mg/L
IRON, TOTAL	0.09	mg/L
MANGANESE, TOTAL	2.6	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	28	mg/L
SULFATE	140	mg/L

CLIENT I.D.: PCA 9-6 (A)
ERG SAMPLE NO: 02/102800
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.008	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	710	umho/cm
pH, FIELD,	5.9	S.U.
CHLORIDE	28	mg/L
IRON, TOTAL	13	mg/L
MANGANESE, TOTAL	1.1	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	41	mg/L
SULFATE	240	mg/L

CLIENT I.D.: PCA 9-8 (A)
ERG SAMPLE NO: 02/102804
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.18	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998.1 - COMMANDER 04-30-8

CLIENT I.D.: PCA 9-8 (A)
ERG SAMPLE NO: 02/102804
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-84

PARAMETER	RESULTS	UNITS
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	690	umho/cm
pH, FIELD,	6.4	S.U.
CHLORIDE	26	mg/L
IRON, TOTAL	0.05	mg/L
MANGANESE, TOTAL	1.2	mg/L
PHENOLS	0.004	mg/L
SODIUM, TOTAL	27	mg/L
SULFATE	81	mg/L

CLIENT I.D.: PCA 9-9 (A)
ERG SAMPLE NO: 02/102808
MATRIX: NATURAL WATER
DATE COLLECTED: 02-06-84

PARAMETER	RESULTS	UNI
HALOSCAN - T		
ORGANIC CHLORIDE	0.03	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.056	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	970	umho/cm
pH, FIELD,	6.2	S.U.
CHLORIDE	7	mg/L
IRON, TOTAL	0.06	mg/L
MANGANESE, TOTAL	15	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	55	mg/L
SULFATE	250	mg/L

CLIENT I.D.: PCA 9-2 (A)
ERG SAMPLE NO: 02/102812
MATRIX: NATURAL WATER
DATE COLLECTED: 02-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.23	mg/

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998.1 - COMMANDER 04-30-8

CLIENT I.D.: PCA 9-2 (A)
ERG SAMPLE NO: 02/102812
MATRIX: NATURAL WATER
DATE COLLECTED: 02-07-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC	4	mg/L
CONDUCTANCE, SPECIFIC	490	umho/cm
pH, FIELD	6.4	S.U.
CHLORIDE	10	mg/L
IRON, TOTAL	10	mg/L
MANGANESE, TOTAL	20	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	14	mg/L
SULFATE	54	mg/L

CLIENT I.D.: PCA 9-3 (A)
ERG SAMPLE NO: 02/102816
MATRIX: NATURAL WATER
DATE COLLECTED: 02-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.19	mg/L
CARBON, TOTAL ORGANIC	2	mg/L
CONDUCTANCE, SPECIFIC	570	umho/cm
pH, FIELD	6.4	S.U.
CHLORIDE	10	mg/L
IRON, TOTAL	0.01	mg/L
MANGANESE, TOTAL	0.40	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	28	mg/L
SULFATE	80	mg/L

CLIENT I.D.: PCA 9-7 (A)
ERG SAMPLE NO: 02/102820
MATRIX: NATURAL WATER
DATE COLLECTED: 02-07-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.30	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.027	mg/L
CARBON, TOTAL ORGANIC	4	mg/

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998.1 - COMMANDER 04-30-[illegible]

CLIENT I.D.: PCA 9-7 (A)
ERG SAMPLE NO: 02/103820
MATRIX: NATURAL WATER
DATE COLLECTED: 02-07-84

PARAMETER	RESULTS	UNITS
CONDUCTANCE, SPECIFIC	1700	umho/cm
pH, FIELD	6.4	S.U.
CHLORIDE	18	mg/L
IRON, TOTAL	0.02	mg/L
MANGANESE, TOTAL	0.21	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	110	mg/L
SULFATE	680	mg/L

CONTINUED

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 9-1	9-7	9-4	9-8	9-5	9-3	9-9
WATER										
LEVELS (A)	20 JUL 83		FT	722.4	722.8	706.4		709.0	705.1	
LEVELS (A)	30 JUL 83		FT		718.6					
LEVELS (A)	31 JUL 83		FT	720.4		707.7		706.0		
LEVELS (A)	03 AUG 83		FT						703.6	
ENDRIN	30 JUL 83	.04	UGL		ND					ND
ENDRIN	31 JUL 83	.04	UGL				ND	ND		
ENDRIN	03 AUG 83	.04	UGL	ND		ND			ND	
LINDANE	30 JUL 83	.08	UGL		ND					ND
LINDANE	31 JUL 83	.08	UGL				ND	ND		
LINDANE	03 AUG 83	.08	UGL	ND		ND			ND	
TOXAPHENE	30 JUL 83	1.6	UGL		ND					ND
TOXAPHENE	31 JUL 83	1.6	UGL				ND	ND		
TOXAPHENE	03 AUG 83	1.6	UGL	ND		ND			ND	
METHOXYCHLOR	30 JUL 83	1.6	UGL		ND					ND
METHOXYCHLOR	31 JUL 83	1.6	UGL				ND	ND		
METHOXYCHLOR	03 AUG 83	1.6	UGL	ND		ND			ND	
2,4-D	30 JUL 83	3.8	UGL		ND					ND
2,4-D	31 JUL 83	3.8	UGL				ND	ND		
2,4-D	03 AUG 83	3.8	UGL	ND		ND			ND	
SILVEX	30 JUL 83	.5	UGL		ND					ND
SILVEX	31 JUL 83	.5	UGL				ND	ND		
SILVEX	03 AUG 83	.5	UGL	ND		ND			ND	
PH(FIELD)	30 JUL 83		PH		6.1					6.3
PH(FIELD)	30 JUL 83		PH		6.1					6.2
PH(FIELD)	30 JUL 83		PH		6.1					6.2
PH(FIELD)	30 JUL 83		PH		6.1					6.2
PH(FIELD)	31 JUL 83		PH				6.4	6.3		
PH(FIELD)	31 JUL 83		PH				6.5	6.4		
PH(FIELD)	31 JUL 83		PH				6.4	6.3		
PH(FIELD)	31 JUL 83		PH				6.4	6.4		
PH(FIELD)	03 AUG 83		PH	6.6		5.7			6.1	
PH(FIELD)	03 AUG 83		PH	6.7		5.7			6.1	
PH(FIELD)	03 AUG 83		PH	6.7		5.7			6.1	
PH(FIELD)	03 AUG 83		PH	6.6		5.7			6.1	
SPEC COND	30 JUL 83	1.	UMC		1670.					990.
SPEC COND	30 JUL 83	1.	UMC		1680.					990.
SPEC COND	30 JUL 83	1.	UMC		1680.					1000.
SPEC COND	30 JUL 83	1.	UMC		1670.					1000.
SPEC COND	31 JUL 83	1.	UMC				980.	920.		
SPEC COND	31 JUL 83	1.	UMC				985.	910.		

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RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	B 9-1	9-7	9-4	9-8	9-5	9-3	9-9
SPEC COND	31 JUL 83	1.	UMC				990.	920.		
SPEC COND	31 JUL 83	1.	UMC				980.	910.		
SPEC COND	03 AUG 83	1.	UMC	500.		540.			770.	
SPEC COND	03 AUG 83	1.	UMC	510.		540.			770.	
SPEC COND	03 AUG 83	1.	UMC	510.		540.			770.	
SPEC COND	03 AUG 83	1.	UMC	500.		540.			770.	
TOC	30 JUL 83	1.0	MGL		20.0					31.0
TOC	30 JUL 83	1.0	MGL		20.0					30.0
TOC	30 JUL 83	1.0	MGL		20.0					29.0
TOC	30 JUL 83	1.0	MGL		20.0					29.0
TOC	31 JUL 83	1.0	MGL				44.0	44.0		
TOC	31 JUL 83	1.0	MGL				45.0	43.0		
TOC	31 JUL 83	1.0	MGL				44.0	43.0		
TOC	31 JUL 83	1.0	MGL				45.0	42.0		
TOC	03 AUG 83	1.0	MGL	27.0		32.0			48.0	
TOC	03 AUG 83	1.0	MGL	26.0		33.0			48.0	
TOC	03 AUG 83	1.0	MGL	26.0		31.0			47.0	
TOC	03 AUG 83	1.0	MGL	27.0		30.0			48.0	
TOX	30 JUL 83	.010	MGL		.022 C					.025 C
TOX	30 JUL 83	.010	MGL		ND					.017 C
TOX	30 JUL 83	.010	MGL		ND					.027 C
TOX	30 JUL 83	.010	MGL		ND					.032 C
TOX	31 JUL 83	.010	MGL				.016 C	.120 C		
TOX	31 JUL 83	.010	MGL				.015 C	.120 C		
TOX	31 JUL 83	.010	MGL				.019 C	.120 C		
TOX	31 JUL 83	.010	MGL				.018 C	.130 C		
TOX	03 AUG 83	.010	MGL	ND		.023 C			.470 C	
TOX	03 AUG 83	.010	MGL	ND		.025 C			.470 C	
TOX	03 AUG 83	.010	MGL	ND		.022 C			.470 C	
TOX	03 AUG 83	.010	MGL	ND		.024 C			.500 C	

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2	9-6
WATER					
LEVELS (A)	20 JUL 83		FT	717.4	
LEVELS (A)	30 JUL 83		FT	713.4	
LEVELS (A)	31 JUL 83		FT		717.4
ENDRIN	30 JUL 83	.04	UGL	ND	
ENDRIN	31 JUL 83	.04	UGL		ND
LINDANE	30 JUL 83	.08	UGL	ND	
LINDANE	31 JUL 83	.08	UGL		ND
TOXAPHENE	30 JUL 83	1.6	UGL	ND	
TOXAPHENE	31 JUL 83	1.6	UGL		ND
METHOXYCHLOR	30 JUL 83	1.6	UGL	ND	
METHOXYCHLOR	31 JUL 83	1.6	UGL		ND
2,4-D	30 JUL 83	3.8	UGL	ND	
2,4-D	31 JUL 83	3.8	UGL		ND
SILVEX	30 JUL 83	.5	UGL	ND	
SILVEX	31 JUL 83	.5	UGL		ND
PH(FIELD)	30 JUL 83		PH	6.3	
PH(FIELD)	30 JUL 83		PH	6.2	
PH(FIELD)	30 JUL 83		PH	6.2	
PH(FIELD)	30 JUL 83		PH	6.2	
SPEC COND	30 JUL 83	1.	UMC	530.	
SPEC COND	30 JUL 83	1.	UMC	530.	
SPEC COND	30 JUL 83	1.	UMC	520.	
SPEC COND	30 JUL 83	1.	UMC	530.	
SPEC COND	31 JUL 83	1.	UMC		810.
SPEC COND	31 JUL 83	1.	UMC		800.
SPEC COND	31 JUL 83	1.	UMC		800.
SPEC COND	31 JUL 83	1.	UMC		800.
TOC	30 JUL 83	1.0	MGL	22.0	
TOC	30 JUL 83	1.0	MGL	22.0	
TOC	30 JUL 83	1.0	MGL	20.0	
TOC	30 JUL 83	1.0	MGL	21.0	
TOC	31 JUL 83	1.0	MGL		31.0
TOC	31 JUL 83	1.0	MGL		31.0
TOC	31 JUL 83	1.0	MGL		31.0
TOC	31 JUL 83	1.0	MGL		31.0
TOX	30 JUL 83	.010	MGL	.021 C	
TOX	30 JUL 83	.010	MGL	ND	
TOX	30 JUL 83	.010	MGL	ND	
TOX	30 JUL 83	.010	MGL	ND	
TOX	31 JUL 83	.010	MGL		ND
TOX	31 JUL 83	.010	MGL		ND
TOX	31 JUL 83	.010	MGL		ND
TOX	31 JUL 83	.010	MGL		ND

RUN DATE: 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-1 (BACKGROUND WELL)

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.625	437.687	14.937	.061
BACKGROUND STANDARD DEV	.165	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.650	505.000	26.500	.005
CALCULATED STANDARD DEV	.058	5.774	.577	.000
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	.293	2.418	1.263	-1.860
ACCEPT TEST?	OK	OK	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-2

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.625	437.687	14.937	.061
BACKGROUND STANDARD DEV	.165	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.225	527.500	21.250	.009
CALCULATED STANDARD DEV	.050	5.000	.957	.008
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	4.707	3.228	.690	-1.724
ACCEPT TEST?	REJECT	REJECT	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-3

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.625	437.687	14.937	.061
BACKGROUND STANDARD DEV	.165	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.100	770.000	47.750	.477
CALCULATED STANDARD DEV	.000	.000	.500	.015
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	6.235	11.952	3.585	13.745
ACCEPT TEST?	REJECT	REJECT	REJECT	REJECT

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-4

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.625	437.687	14.937	.061
BACKGROUND STANDARD DEV	.165	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	5.700	540.000	31.500	.023
CALCULATED STANDARD DEV	.000	.000	1.291	.001
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	10.986	3.680	1.809	-1.245
ACCEPT TEST?	REJECT	REJECT	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-5

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.625	437.687	14.937	.061
BACKGROUND STANDARD DEV	.165	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.350	915.000	43.000	.122
CALCULATED STANDARD DEV	.058	5.774	.816	.005
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	3.227	17.148	3.066	2.041
ACCEPT TEST?	REJECT	REJECT	REJECT	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-6

	PH	SPEC. COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	.000	437.687	14.937	.061
BACKGROUND STANDARD DEV	.000	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	0	16	16	16
CALCULATED MEAN	.000	802.500	31.000	.005
CALCULATED STANDARD DEV	.000	5.000	.000	.000
SAMPLE SIZE	0	4	4	4
DEGREES OF FREEDOM	0	18	18	18
REFERENCE/BOOK T-VALUE	.000	2.552	2.552	2.552
CALCULATED T-VALUE	.000	13.110	1.755	-1.860
ACCEPT TEST?	OK	REJECT	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-7

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.625	437.687	14.937	.061
BACKGROUND STANDARD DEV	.165	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.100	1675.000	20.000	.009
CALCULATED STANDARD DEV	.000	5.774	.000	.008
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	6.235	44.452	.553	-1.715
ACCEPT TEST?	REJECT	REJECT	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-8

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.625	437.687	14.937	.061
BACKGROUND STANDARD DEV	.165	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.425	983.750	44.500	.017
CALCULATED STANDARD DEV	.050	4.787	.577	.002
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	2.354	19.625	3.230	-1.461
ACCEPT TEST?	OK	REJECT	REJECT	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

RUN DATE 07 NOV 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

GROUND-WATER MONITORING STATISTICAL ANALYSIS

WELL 9-9

	PH	SPEC COND	TOC	TOX
UNITS		UMC	MGL	MGL
BACKGROUND MEAN	6.625	437.687	14.937	.061
BACKGROUND STANDARD DEV	.165	54.484	17.935	.059
BACKGROUND SAMPLE SIZE	16	16	16	16
CALCULATED MEAN	6.225	995.000	29.750	.025
CALCULATED STANDARD DEV	.050	5.774	.957	.006
SAMPLE SIZE	4	4	4	4
DEGREES OF FREEDOM	18	18	18	18
REFERENCE/BOOK T-VALUE	2.878	2.552	2.552	2.552
CALCULATED T-VALUE	4.707	20.022	1.618	-1.186
ACCEPT TEST?	REJECT	REJECT	OK	OK

THIS STUDENT'S T-TEST AT THE 0.01 LEVEL OF SIGNIFICANCE IS A TWO-TAILED TEST FOR PH AND A SINGLE-TAILED TEST FOR THE OTHER INDICATOR PARAMETERS. A CALCULATED T-VALUE GREATER THAN THE REFERENCE T-VALUE INDICATES A STATISTICALLY SIGNIFICANT CHANGE OF THE CONCENTRATION OR VALUE OF THE INDICATOR PARAMETER FROM BACKGROUND. THIS TEST IS FOR DATA WITH SAMPLING DATES FROM 09 JUL 83 TO 31 DEC 83 .

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

Incl 9

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-1	9-7	9-4	9-8	9-5	9-3	9-9
WATER										
LEVELS (A)	20 JUL 83		FT	722.4	722.8	706.4		709.0	705.1	
LEVELS (A)	30 JUL 83		FT		718.6					
LEVELS (A)	31 JUL 83		FT	720.4		707.7		706.0		
LEVELS (A)	03 AUG 83		FT						703.6	
ENDRIN	30 JUL 83	.04	UGL		ND					ND
ENDRIN	31 JUL 83	.04	UGL				ND	ND		
ENDRIN	03 AUG 83	.04	UGL	ND		ND			ND	
LINDANE	30 JUL 83	.08	UGL		ND					ND
LINDANE	31 JUL 83	.08	UGL				ND	ND		
LINDANE	03 AUG 83	.08	UGL	ND		ND			ND	
TOXAPHENE	30 JUL 83	1.6	UGL		ND					ND
TOXAPHENE	31 JUL 83	1.6	UGL				ND	ND		
TOXAPHENE	03 AUG 83	1.6	UGL	ND		ND			ND	
METHOXYCHLOR	30 JUL 83	1.6	UGL		ND					ND
METHOXYCHLOR	31 JUL 83	1.6	UGL				ND	ND		
METHOXYCHLOR	03 AUG 83	1.6	UGL	ND		ND			ND	
2,4-D	30 JUL 83	3.8	UGL		ND					ND
2,4-D	31 JUL 83	3.8	UGL				ND	ND		
2,4-D	03 AUG 83	3.8	UGL	ND		ND			ND	
SILVEX	30 JUL 83	.5	UGL		ND					ND
SILVEX	31 JUL 83	.5	UGL				ND	ND		
SILVEX	03 AUG 83	.5	UGL	ND		ND			ND	
PH(FIELD)	30 JUL 83		PH		6.1					6.2
PH(FIELD)	30 JUL 83		PH		6.1					6.3
PH(FIELD)	30 JUL 83		PH		6.1					6.2
PH(FIELD)	30 JUL 83		PH		6.1					6.2
PH(FIELD)	31 JUL 83		PH				6.4	6.3		
PH(FIELD)	31 JUL 83		PH				6.4	6.3		
PH(FIELD)	31 JUL 83		PH				6.5	6.4		
PH(FIELD)	31 JUL 83		PH				6.4	6.4		
PH(FIELD)	03 AUG 83		PH	6.6		5.7			6.1	
PH(FIELD)	03 AUG 83		PH	6.7		5.7			6.1	
PH(FIELD)	03 AUG 83		PH	6.7		5.7			6.1	
PH(FIELD)	03 AUG 83		PH	6.6		5.7			6.1	
SPEC COND	30 JUL 83	1.	UMC		1670.					990.
SPEC COND	30 JUL 83	1.	UMC		1680.					990.
SPEC COND	30 JUL 83	1.	UMC		1680.					1000.
SPEC COND	30 JUL 83	1.	UMC		1670.					1000.
SPEC COND	31 JUL 83	1.	UMC				985.	910.		
SPEC COND	31 JUL 83	1.	UMC				990.	920.		

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	9-1	9-7	9-4	9-8	9-5	9-3	9-9
SPEC COND	31 JUL 83	1.	UMC				980.	910.		
SPEC COND	31 JUL 83	1.	UMC				980.	920.		
SPEC COND	03 AUG 83	1.	UMC	500.		540.			770.	
SPEC COND	03 AUG 83	1.	UMC	510.		540.			770.	
SPEC COND	03 AUG 83	1.	UMC	510.		540.			770.	
SPEC COND	03 AUG 83	1.	UMC	500.		540.			770.	
TOC	30 JUL 83	1.0	MGL		20.0					31.0
TOC	30 JUL 83	1.0	MGL		20.0					30.0
TOC	30 JUL 83	1.0	MGL		20.0					29.0
TOC	30 JUL 83	1.0	MGL		20.0					29.0
TOC	31 JUL 83	1.0	MGL				44.0	44.0		
TOC	31 JUL 83	1.0	MGL				45.0	43.0		
TOC	31 JUL 83	1.0	MGL				44.0	43.0		
TOC	31 JUL 83	1.0	MGL				45.0	42.0		
TOC	03 AUG 83	1.0	MGL	27.0		32.0			48.0	
TOC	03 AUG 83	1.0	MGL	27.0		33.0			48.0	
TOC	03 AUG 83	1.0	MGL	26.0		30.0			48.0	
TOC	03 AUG 83	1.0	MGL	26.0		31.0			47.0	
TOX	30 JUL 83	.010	MGL		ND					.032 C
TOX	30 JUL 83	.010	MGL		.022 C					.027 C
TOX	30 JUL 83	.010	MGL		ND					.025 C
TOX	30 JUL 83	.010	MGL		ND					.017 C
TOX	31 JUL 83	.010	MGL				.016 C	.120 C		
TOX	31 JUL 83	.010	MGL				.015 C	.120 C		
TOX	31 JUL 83	.010	MGL				.018 C	.120 C		
TOX	31 JUL 83	.010	MGL				.019 C	.130 C		
TOX	03 AUG 83	.010	MGL	ND		.022 C			.500 C	
TOX	03 AUG 83	.010	MGL	ND		.024 C			.470 C	
TOX	03 AUG 83	.010	MGL	ND		.025 C			.470 C	
TOX	03 AUG 83	.010	MGL	ND		.023 C			.470 C	

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2		9-6
WATER						
LEVELS (A)	20 JUL 83		FT	717.4		
LEVELS (A)	30 JUL 83		FT	713.4		
LEVELS (A)	31 JUL 83		FT			717.4
ENDRIN	30 JUL 83	.04	UGL	ND		
ENDRIN	31 JUL 83	.04	UGL			ND
LINDANE	30 JUL 83	.08	UGL	ND		
LINDANE	31 JUL 83	.08	UGL			ND
TOXAPHENE	30 JUL 83	1.6	UGL	ND		
TOXAPHENE	31 JUL 83	1.6	UGL			ND
METHOXYCHLOR	30 JUL 83	1.6	UGL	ND		
METHOXYCHLOR	31 JUL 83	1.6	UGL			ND
2,4-D	30 JUL 83	3.8	UGL	ND		
2,4-D	31 JUL 83	3.8	UGL			ND
SILVEX	30 JUL 83	.5	UGL	ND		
SILVEX	31 JUL 83	.5	UGL			ND
PH(FIELD)	30 JUL 83		PH	6.2		
PH(FIELD)	30 JUL 83		PH	6.2		
PH(FIELD)	30 JUL 83		PH	6.2		
PH(FIELD)	30 JUL 83		PH	6.3		
SPEC COND	30 JUL 83	1.	UMC	530.		
SPEC COND	30 JUL 83	1.	UMC	520.		
SPEC COND	30 JUL 83	1.	UMC	530.		
SPEC COND	30 JUL 83	1.	UMC	530.		
SPEC COND	31 JUL 83	1.	UMC			800.
SPEC COND	31 JUL 83	1.	UMC			800.
SPEC COND	31 JUL 83	1.	UMC			800.
SPEC COND	31 JUL 83	1.	UMC			810.
TOC	30 JUL 83	1.0	MGL	21.0		
TOC	30 JUL 83	1.0	MGL	22.0		
TOC	30 JUL 83	1.0	MGL	22.0		
TOC	30 JUL 83	1.0	MGL	20.0		
TOC	31 JUL 83	1.0	MGL			31.0
TOC	31 JUL 83	1.0	MGL			31.0
TOC	31 JUL 83	1.0	MGL			31.0
TOC	31 JUL 83	1.0	MGL			31.0
TOX	30 JUL 83	.010	MGL	ND		
TOX	30 JUL 83	.010	MGL	.021	C	
TOX	30 JUL 83	.010	MGL	ND		
TOX	30 JUL 83	.010	MGL	ND		
TOX	31 JUL 83	.010	MGL			ND
TOX	31 JUL 83	.010	MGL			ND
TOX	31 JUL 83	.010	MGL			ND
TOX	31 JUL 83	.010	MGL			ND

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

CRANE NWSC
PURGEABLE ORGANIC PRIORITY POLLUTANT
COMPOUNDS DETECTED AND RESULTS (ug/L)
SAMPLES COLLECTED 20 JULY 1983

	Travel Blank	9-1	9-2*	9-3*	9-4	9-5	9-6	9-7	9-8	9-
Methylene chloride	2	2	2		1	2	3	2	2	2
trichlorofluoromethane	1	1	1		1	1	1	1	1	1
1,1,1-trichloroethane	1			40	1	10	1	1	1	
1,1,2,2-tetrachloroethane	1		1					1	2	
toluene	1							3		
chloroform			1							
trichloroethylene				588	20	24	1	1	7	
trans-1, -dichloroethylene				870	38	13			11	
tetrachlaroethylene					1					
benzene					1		1	2		

* Confirmed by mass spectroscopy.
Note: Blank space indicated not detected.

INCL 14

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

CRANE NWSC
PURGEABLE ORGANIC PRIORITY POLLUTANTS
COMPOUNDS DETECTED AND RESULTS (ug/L)
SAMPLES COLLECTED ON 30 JULY 1983

	Travel Blank	Bailer Blank	9-2	9-7	9-9
1,1,1-trichloroethane	1	1	1		1
trichloroethylene			1		
chloroform		1			
1,1,2,2-tetrachloroethane		5			

Note: Blank space indicates not detected.

INCL 15

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

CRANE NWSC
PURGEABLE ORGANIC PRIORITY POLLUTANTS
COMPOUNDS DETECTED AND RESULTS (ug/L)
SAMPLES COLLECTED ON 31 JULY 1983

	Travel Blank	Bailer Blank	Pump Blank	9-5*	9-6	9-8
Methylene chloride	4		2	3		
trichlorofluoromethane	4			3		
1,1,1-trichloroethane	3		1	8		1
chloroform			1			11
trichloroethylene	1	4	1	9		5
trans-1,2-dichloroethylene				8		3
tetrachloroethylene						5
1,1,2,2-tetrachloroethane		2	4			
1,3-dichlorobenzene		1				

* Confirmed by mass spectroscopy.
Note: Blank Space indicates not detected.

INCL 16

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

CRANE NWSC
PURGEABLE ORGANIC PRIORITY POLLUTANTS
COMPOUNDS DETECTED AND RESULTS (ug/L)
SAMPLES COLLECTED 3 AUGUST 1983

	Travel Blank	9-1	9-3*	9-4*
methylene chloride	2		4	
trichlorofluoromethane	4		2	
1,1,1-trichloroethane	5		5	1
chloroform				17
trichloroethylene	1			7
trans-1,2-dichloroethylene				18
tetrachloroethylene				4
1,1,2,2-tetrachloroethane		2		

* Confirmed by mass spectroscopy.
Note: Blank space indicates not detected.

Incl 17

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

CRANE NWSC
RADIOCHEMISTRY RESULTS

Well	Sampling Date	Radium-226	Strontium-90
9-5	14 Sep 82	.24	

INCL 18

Incl 19

COMPOUNDS ANALYZED AND DETECTION LIMITS(UGL)

PURGEABLE ORGANIC COMPOUNDS	
BENZENE	1.0
CARBON TETRACHLORIDE	1.0
CHLOROBENZENE	1.0
1,2-DICHLOROETHANE	1.0
1,1,1-TRICHLOROETHANE	1.0
1,1-DICHLOROETHANE	1.0
1,1,2-TRICHLOROETHANE	1.0
1,1,2,2-TETRACHLOROETHANE	1.0
CHLOROETHANE	2.0
2-CHLOROETHYLVINYL ETHER	2.0
CHLOROFORM	1.0
1,2-DICHLOROBENZENE	1.0
1,3-DICHLOROBENZENE	1.0
1,4-DICHLOROBENZENE	1.0
1,1-DICHLOROETHYLENE	1.0
TRANS-1,2-DICHLOROETHYLENE	1.0
1,2-DICHLOROPROPANE	1.0
1,3-DICHLOROPROPENE	1.0
ETHYLBENZENE	1.0
METHYLENE CHLORIDE	1.0
CHLOROMETHANE	2.0
BROMOMETHANE	2.0
BROMOFORM	2.0
BROMODICHLOROMETHANE	1.0
TRICHLOROFLUOROMETHANE	1.0
DICHLORODIFLUOROMETHANE	2.0
DIBROMOCHLOROMETHANE	1.0
TETRACHLOROETHYLENE	1.0
TOLUENE	1.0
TRICHLOROETHYLENE	1.0
VINYL CHLORIDE	1.0

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-1	9-7	9-4	9-8	9-5	9-3	9-9
WATER LEVELS (A)	23 FEB 83		FT		719.3					
LEVELS (A)	24 FEB 83		FT	723.0		708.3		707.6	705.7	
CHLORIDE	23 FEB 83	1.0	MGL							7.0
CHLORIDE	28 FEB 83	1.0	MGL	3.0	15.0	33.0	19.0	22.0	12.4	
IRON	23 FEB 83	.03	MGL							2.50#
IRON	28 FEB 83	.03	MGL	ND	ND	ND	.15	ND	ND	
MANGANESE	23 FEB 83	.01	MGL							40.00#
MANGANESE	28 FEB 83	.01	MGL	.01	.26#	.44#	2.03#	1.25#	.62#	
PHENOL	23 FEB 83	.01	MGL							ND
PHENOL	28 FEB 83	.01	MGL	.01	ND	ND	ND	ND	ND	
SODIUM	23 FEB 83	1.	MGL							51.
SODIUM	28 FEB 83	1.	MGL	27.	99.	24.	43.	28.	30.	
SULFATE	23 FEB 83	5.0	MGL							200.0
SULFATE	28 FEB 83	5.0	MGL	26.0	730.0#	79.0	110.0	120.0	85.0	
PH(FIELD)	23 FEB 83		PH							6.1#
PH(FIELD)	23 FEB 83		PH							6.1#
PH(FIELD)	23 FEB 83		PH							6.1#
PH(FIELD)	23 FEB 83		PH							6.1#
PH(FIELD)	28 FEB 83		PH	7.0	6.4#	6.4#	6.5	6.3#	6.4#	
PH(FIELD)	28 FEB 83		PH	7.0	6.3#	6.5	6.6	6.3#	6.4#	
PH(FIELD)	28 FEB 83		PH	7.0	6.3#	6.4#	6.5	6.3#	6.4#	
PH(FIELD)	28 FEB 83		PH	7.0	6.3#	6.5	6.5	6.3#	6.4#	
SPEC COND	23 FEB 83	1.	UMC							935.
SPEC COND	23 FEB 83	1.	UMC							935.
SPEC COND	23 FEB 83	1.	UMC							935.
SPEC COND	23 FEB 83	1.	UMC							940.
SPEC COND	28 FEB 83	1.	UMC	490.	1340.	760.	825.	695.	620.	
SPEC COND	28 FEB 83	1.	UMC	490.	1340.	760.	825.	700.	623.	
SPEC COND	28 FEB 83	1.	UMC	490.	1345.	765.	825.	700.	620.	
SPEC COND	28 FEB 83	1.	UMC	495.	1340.	765.	820.	695.	625.	
TOC	23 FEB 83	1.0	MGL							27.0
TOC	23 FEB 83	1.0	MGL							27.0
TOC	23 FEB 83	1.0	MGL							26.0
TOC	23 FEB 83	1.0	MGL							26.0
TOC	28 FEB 83	1.0	MGL	17.0	23.0	70.0	46.0	56.0	57.0	
TOC	28 FEB 83	1.0	MGL	17.0	23.0	70.0	46.0	57.0	56.0	
TOC	28 FEB 83	1.0	MGL	16.0	23.0	69.0	47.0	56.0	57.0	
TOC	28 FEB 83	1.0	MGL	17.0	22.0	69.0	47.0	56.0	57.0	
TOX	23 FEB 83	.010	MGL							.058 C
TOX	23 FEB 83	.010	MGL							.059 C

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-1		9-7		9-4		9-8		9-5		9-3		9-9	
TOX	23 FEB 83	.010	MGL													.053	C
TOX	23 FEB 83	.010	MGL													.050	C
TOX	28 FEB 83	.010	MGL	.012	C	.012	C	.046	C	.013	C	.037	C	.500	C		
TOX	28 FEB 83	.010	MGL	ND		ND		.044	C	.019	C	.033	C	.540	C		
TOX	28 FEB 83	.010	MGL	ND		ND		.042	C	.015	C	.035	C	.500	C		
TOX	28 FEB 83	.010	MGL	.011	C	.011	C	.043	C	.017	C	.031	C	.500	C		

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2		9-6	
WATER LEVELS (A)	23 FEB 83		FT	717.2		718.9	
CHLORIDE	23 FEB 83	1.0	MGL	8.0		28.0	
IRON	23 FEB 83	.03	MGL	14.10#		9.00#	
MANGANESE	23 FEB 83	.01	MGL	24.00#		1.75#	
PHENOL	23 FEB 83	.01	MGL	ND		ND	
SODIUM	23 FEB 83	1.	MGL	22.		41.	
SULFATE	23 FEB 83	5.0	MGL	56.0		230.0	
PH(FIELD)	23 FEB 83		PH	6.3#		5.8#	
PH(FIELD)	23 FEB 83		PH	6.3#		5.8#	
PH(FIELD)	23 FEB 83		PH	6.3#		5.8#	
PH(FIELD)	23 FEB 83		PH	6.3#		5.8#	
SPEC COND	23 FEB 83	1.	UMC	540.		805.	
SPEC COND	23 FEB 83	1.	UMC	540.		805.	
SPEC COND	23 FEB 83	1.	UMC	540.		800.	
SPEC COND	23 FEB 83	1.	UMC	538.		800.	
TOC	23 FEB 83	1.0	MGL	20.0		23.0	
TOC	23 FEB 83	1.0	MGL	22.0		23.0	
TOC	23 FEB 83	1.0	MGL	21.0		24.0	
TOC	23 FEB 83	1.0	MGL	21.0		24.0	
TOX	23 FEB 83	.010	MGL	.023	C	.032	C
TOX	23 FEB 83	.010	MGL	.029	C	.012	C
TOX	23 FEB 83	.010	MGL	.037	C	ND	
TOX	23 FEB 83	.010	MGL	.042	C	.012	C

RUN DATE: 21 JUN 83

INSTALLATION: CRANE NWSC, IN

SITE: PEST CONTROL STORAGE AREA

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-1	9-7	9-4	9-8	9-5	9-3	9-9
WATER LEVELS (A)	13 SEP 82		FT	721.8	718.8	706.4		706.5	705.3	
ARSENIC	14 SEP 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	14 SEP 82	.1	MGL	.2	ND	ND	ND	ND	ND	.2
CADMIUM	14 SEP 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	14 SEP 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
FLUORIDE	14 SEP 82	.10	MGL	.13	.29	ND	.11	.12	.16	ND
LEAD	14 SEP 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	14 SEP 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
NO2+NO3 AS N	14 SEP 82	.05	MGL	.78	ND	.31	1.00	.28	ND	.41
SELENIUM	14 SEP 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	14 SEP 82	.01	MGL	ND	ND	ND	ND	ND	ND	ND
ENDRIN	14 SEP 82	.04	UGL	ND	ND	ND	ND	ND	ND	ND
LINDANE	14 SEP 82	.08	UGL	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	14 SEP 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	14 SEP 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
2,4-D	14 SEP 82	3.8	UGL	ND	ND	ND	ND	ND	ND	ND
SILVEX	14 SEP 82	.5	UGL	ND	ND	ND	ND	ND	ND	ND
GROSS ALPHA	14 SEP 82	7.76	PCL	<3.33	<7.76	<5.01	4.38	<5.18	<4.76	<6.87
GROSS BETA	14 SEP 82	1.77	PCL	ND	1.54	2.99	1.45	1.37	ND	ND
CHLORIDE	14 SEP 82	1.0	MGL	2.0	8.0	12.0	26.0	23.6	12.0	3.0
IRON	14 SEP 82	.03	MGL	.13	.12	.10	ND	.15	.06	.07
MANGANESE	14 SEP 82	.01	MGL	ND	.67#	.63#	2.07#	1.95#	.75#	21.00#
PHENOL	14 SEP 82	.01	MGL	ND	ND	ND	ND	ND	ND	ND
SODIUM	14 SEP 82	1.	MGL	26.	116.	24.	29.	29.	33.	85.
SULFATE	14 SEP 82	5.0	MGL	31.0	420.0#	71.0	100.0	116.0	87.0	120.0
PH(FIELD)	14 SEP 82		PH	6.4#	6.1#	6.2#	5.1#	6.4#	6.3#	6.1#
PH(FIELD)	14 SEP 82		PH	6.4#	6.1#	6.3#	6.0#	6.4#	6.2#	6.0#
PH(FIELD)	14 SEP 82		PH	6.3#	6.1#	6.1#	5.9#	6.4#	6.3#	6.0#
PH(FIELD)	14 SEP 82		PH	6.4#	6.0#	6.0#	6.1#	6.3#	6.1#	5.9#
SPEC COND	14 SEP 82	1.	UMC	385.	1170.	930.	780.	820.	770.	1300.
SPEC COND	14 SEP 82	1.	UMC	390.	1160.	940.	780.	820.	775.	1300.
SPEC COND	14 SEP 82	1.	UMC	390.	1160.	940.	780.	820.	775.	1300.
SPEC COND	14 SEP 82	1.	UMC	385.	1160.	935.	770.	820.	780.	1280.
TOC	14 SEP 82	1.0	MGL	10.0	12.0	16.0	16.0	4.0	15.0	4.0
TOC	14 SEP 82	1.0	MGL	10.0	13.0	15.0	17.0	4.0	16.0	5.0
TOC	14 SEP 82	1.0	MGL	11.0	12.0	16.0	16.0	4.0	15.0	4.0
TOC	14 SEP 82	1.0	MGL	10.0	12.0	15.0	16.0	4.0	16.0	5.0
TOX	14 SEP 82	.010	MGL	.110 C	.150 C	.060 C	.150 C	.160 C	.710 C	.200 C
TOX	14 SEP 82	.010	MGL	.130 C	.120 C	.079 C	.150 C	.160 C	.700 C	.170 C
TOX	14 SEP 82	.010	MGL	.100 C	.120 C	.100 C	.200 C	.120 C	.740 C	.160 C
TOX	14 SEP 82	.010	MGL	.088 C	.120 C	.075 C	.150 C	.120 C	.700 C	.150 C

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2		9-6	
WATER							
LEVELS (A)	13 SEP 82		FT	716.8		718.8	
ARSENIC	14 SEP 82	.010	MGL	ND		ND	
BARIUM	14 SEP 82	.1	MGL	.1		ND	
CADMIUM	14 SEP 82	.005	MGL	ND		ND	
CHROMIUM	14 SEP 82	.010	MGL	ND		ND	
FLUORIDE	14 SEP 82	.10	MGL	.11		.27	
LEAD	14 SEP 82	.010	MGL	ND		ND	
MERCURY	14 SEP 82	.2	UGL	ND		ND	
NO2+NO3 AS N	14 SEP 82	.05	MGL	ND		.20	
SELENIUM	14 SEP 82	.005	MGL	ND		ND	
SILVER	14 SEP 82	.01	MGL	ND		ND	
ENDRIN	14 SEP 82	.04	UGL	ND		ND	
LINDANE	14 SEP 82	.08	UGL	ND		ND	
TOXAPHENE	14 SEP 82	1.6	UGL	ND		ND	
METHOXYCHLOR	14 SEP 82	1.6	UGL	ND		ND	
2,4-D	14 SEP 82	3.8	UGL	ND		ND	
SILVEX	14 SEP 82	.5	UGL	ND		ND	
GROSS ALPHA	14 SEP 82	4.08	PCL	ND		ND	
GROSS BETA	14 SEP 82	1.71	PCL	2.47		ND	
CHLORIDE	14 SEP 82	1.0	MGL	9.0		40.0	
IRON	14 SEP 82	.03	MGL	14.50#		1.68#	
MANGANESE	14 SEP 82	.01	MGL	33.00#		1.19#	
PHENOL	14 SEP 82	.01	MGL	ND		ND	
SODIUM	14 SEP 82	1.	MGL	29.		40.	
SULFATE	14 SEP 82	5.0	MGL	86.0		110.0	
PH(FIELD)	14 SEP 82		PH	5.1#		5.8#	
PH(FIELD)	14 SEP 82		PH	5.9#		5.8#	
PH(FIELD)	14 SEP 82		PH	5.9#		5.9#	
PH(FIELD)	14 SEP 82		PH	5.9#		5.9#	
SPEC COND	14 SEP 82	1.	UMC	660.		595.	
SPEC COND	14 SEP 82	1.	UMC	660.		595.	
SPEC COND	14 SEP 82	1.	UMC	660.		590.	
SPEC COND	14 SEP 82	1.	UMC	660.		600.	
TOC	14 SEP 82	1.0	MGL	18.0		8.0	
TOC	14 SEP 82	1.0	MGL	18.0		8.0	
TOC	14 SEP 82	1.0	MGL	18.0		9.0	
TOC	14 SEP 82	1.0	MGL	19.0		8.0	
TOX	14 SEP 82	.010	MGL	.041	C	.086	C
TOX	14 SEP 82	.010	MGL	.035	C	.120	C
TOX	14 SEP 82	.010	MGL	.061	C	.063	C
TOX	14 SEP 82	.010	MGL	.089	C	.093	C

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

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VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
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NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
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CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-1	9-7	9-4	9-8	9-5	9-3	9-9
GROSS ALPHA	14 DEC 81	7.56	PCL	<3.07	<7.56	<5.06	<4.51	<4.82	<4.19	<4.91
GROSS ALPHA	06 APR 82	2.79	PCL	1.56	ND	ND	2.52	ND	ND	ND
GROSS ALPHA	27 JUL 82	7.19	PCL	<3.53	<7.19	<4.59	<7.00	<4.87	<5.30	<7.18
GROSS ALPHA	14 SEP 82	7.76	PCL	<3.23	<7.76	<5.01	4.38	<5.18	<4.76	<6.87
RADIUM-226	27 JUL 82	.11	PCL		ND		.41		.83	.40
GROSS BETA	14 DEC 81	1.51	PCL	1.62	1.22	5.38	6.73	4.14	ND	2.75
GROSS BETA	06 APR 82	2.62	PCL	ND	ND	2.33	ND	ND	ND	ND
GROSS BETA	27 JUL 82	1.65	PCL	ND	ND	1.67	ND	ND	ND	ND
GROSS BETA	14 SEP 82	1.77	PCL	ND	1.54	2.99	1.45	1.37	ND	ND

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2	9-6
GROSS ALPHA	14 DEC 81	4.48	PCL	ND	ND
GROSS ALPHA	06 APR 82	1.37	PCL	2.56	ND
GROSS ALPHA	27 JUL 82	5.21	PCL	< 5.21	< 3.71
GROSS ALPHA	14 SEP 82	4.08	PCL	ND	ND
RADIUM-226	27 JUL 82	.05	PCL	1.04	
GROSS BETA	14 DEC 81	1.30	PCL	3.45	2.39
GROSS BETA	14 DEC 81	1.30	PCL		1.30
GROSS BETA	06 APR 82	2.56	PCL	ND	ND
GROSS BETA	27 JUL 82	1.59	PCL	1.93	ND
GROSS BETA	14 SEP 82	1.71	PCL	2.47	ND

RUN DATE: 14 JAN 83

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

LEGEND

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B UPGRADIENT SITE

C RESULTS ARE FOR UNFILTERED SAMPLE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-1	9-7	9-4	9-6	9-5	9-3	9-9
WATER LEVELS (A)	26 JUL 82		FT	721.8	718.8	707.9		706.5	705.3	
ARSENIC	27 JUL 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	27 JUL 82	.1	MGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	27 JUL 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	27 JUL 82	.010	MGL	.020	ND	ND	ND	ND	ND	ND
FLUORIDE	27 JUL 82	.10	MGL	.15	.33	.10	.13	.11	.16	ND
LEAD	27 JUL 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	27 JUL 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
NO2+NO3 AS N	27 JUL 82	.05	MGL	.72	.10	.13	.59	.25	ND	.21
SELENIUM	27 JUL 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	27 JUL 82	.01	MGL	ND	ND	ND	ND	ND	ND	ND
ENDRIN	27 JUL 82	.04	UGL	ND	ND	ND	ND	ND	ND	ND
LINDANE	27 JUL 82	.08	UGL	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	27 JUL 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
METHOXYCHLOR	27 JUL 82	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
2,4-D	27 JUL 82	3.8	UGL	ND	ND	ND	ND	ND	ND	ND
SILVEX	27 JUL 82	.5	UGL	ND	ND	ND	ND	ND	ND	ND
GROSS ALPHA	27 JUL 82	7.19	PCL	<3.53	<7.19	<4.59	<7.00	<4.87	<5.30	<7.18
GROSS BETA	27 JUL 82	1.65	PCL	ND	ND	1.67	ND	ND	ND	ND
CHLORIDE	27 JUL 82	1.0	MGL	4.0	13.0	28.0	21.0	25.0	17.0	10.0
IRON	27 JUL 82	.03	MGL	3.52#	.11	ND	.11	ND	ND	ND
MANGANESE	27 JUL 82	.01	MGL	.24#	.36#	.90#	1.76#	1.65#	.68#	2.20#
PHENOL	27 JUL 82	.01	MGL	.02	ND	.03	.02	.01	.03	.01
SODIUM	27 JUL 82	1.	MGL	25.	94.	26.	38.	31.	34.	84.
SULFATE	27 JUL 82	5.0	MGL	36.0	420.0#	93.0	100.0	110.0	88.0	230.0
PH(FIELD)	27 JUL 82		PH	6.6	6.3#	6.2#	6.3#	6.3#	6.4#	6.2#
PH(FIELD)	27 JUL 82		PH	6.7	6.3#	6.0#	6.3#	6.2#	6.4#	6.3#
PH(FIELD)	27 JUL 82		PH	6.6	6.3#	6.0#	6.3#	6.2#	6.5	6.2#
PH(FIELD)	27 JUL 82		PH	6.7	6.3#	6.1#	6.3#	6.2#	6.4#	6.2#
SPEC COND	27 JUL 82	1.	UMC	390.	1503.	800.	765.	730.	535.	1055.
SPEC COND	27 JUL 82	1.	UMC	385.	1502.	800.	760.	735.	535.	1050.
SPEC COND	27 JUL 82	1.	UMC	390.	1504.	795.	755.	740.	540.	1045.
SPEC COND	27 JUL 82	1.	UMC	390.	1503.	798.	760.	730.	538.	1055.
TOC	27 JUL 82	1.0	MGL	44.0	67.0	61.0	56.0	60.0	70.0	83.0
TOC	27 JUL 82	1.0	MGL	45.0	68.0	61.0	59.0	59.0	70.0	87.0
TOC	27 JUL 82	1.0	MGL	45.0	68.0	60.0	57.0	60.0	71.0	85.0
TOC	27 JUL 82	1.0	MGL	44.0	68.0	61.0	56.0	60.0	71.0	86.0
TOX	27 JUL 82	.010	MGL	ND	ND	.027 C	.010 C	.050 C	.650 C	.051 C
TOX	27 JUL 82	.010	MGL	ND	ND	.027 C	.021 C	.038 C	.480 C	.053 C
TOX	27 JUL 82	.010	MGL	ND	ND	.070 C	.016 C	.055 C	.510 C	.056 C
TOX	27 JUL 82	.010	MGL	ND	ND	.031 C	.013 C	.038 C	.520 C	.052 C

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2		9-6
WATER						
LEVELS (A)	26 JUL 82		FT	715.3		718.8
ARSENIC	27 JUL 82	.010	MGL	ND		ND
BARIUM	27 JUL 82	.1	MGL	ND		ND
CADMIUM	27 JUL 82	.005	MGL	ND		ND
CHROMIUM	27 JUL 82	.010	MGL	ND		ND
FLUORIDE	27 JUL 82	.10	MGL	.10		.27
LEAD	27 JUL 82	.010	MGL	ND		ND
MERCURY	27 JUL 82	.2	UGL	ND		ND
NO2+NO3 AS N	27 JUL 82	.05	MGL	.08		.18
SELENIUM	27 JUL 82	.005	MGL	ND		ND
SILVER	27 JUL 82	.01	MGL	.02		ND
ENDRIN	27 JUL 82	.04	UGL	ND		ND
LINDANE	27 JUL 82	.08	UGL	ND		ND
TOXAPHENE	27 JUL 82	1.6	UGL	ND		ND
METHOXYCHLOR	27 JUL 82	1.6	UGL	ND		ND
2,4-D	27 JUL 82	3.8	UGL	ND		ND
SILVEX	27 JUL 82	.5	UGL	ND		ND
GROSS ALPHA	27 JUL 82	5.21	PCL	<5.21		<3.71
GROSS BETA	27 JUL 82	1.59	PCL	1.93		ND
CHLORIDE	27 JUL 82	1.0	MGL	10.0		38.0
IRON	27 JUL 82	.03	MGL	10.20#		1.09#
MANGANESE	27 JUL 82	.01	MGL	33.00#		1.20#
PHENOL	27 JUL 82	.01	MGL	.03		.01
SODIUM	27 JUL 82	1.	MGL	39.		48.
SULFATE	27 JUL 82	5.0	MGL	110.0		100.0
PH(FIELD)	27 JUL 82		PH	6.2#		5.9#
PH(FIELD)	27 JUL 82		PH	6.2#		6.0#
PH(FIELD)	27 JUL 82		PH	6.2#		5.9#
PH(FIELD)	27 JUL 82		PH	6.2#		5.9#
SPEC COND	27 JUL 82	1.	UMC	780.		550.
SPEC COND	27 JUL 82	1.	UMC	760.		550.
SPEC COND	27 JUL 82	1.	UMC	780.		555.
SPEC COND	27 JUL 82	1.	UMC	780.		550.
TOC	27 JUL 82	1.0	MGL	83.0		42.0
TOC	27 JUL 82	1.0	MGL	84.0		44.0
TOC	27 JUL 82	1.0	MGL	83.0		44.0
TOC	27 JUL 82	1.0	MGL	84.0		44.0
TOX	27 JUL 82	.010	MGL	ND		ND
TOX	27 JUL 82	.010	MGL	ND		ND
TOX	27 JUL 82	.010	MGL	.020	C	ND
TOX	27 JUL 82	.010	MGL	.014	C	ND

RUN DATE: 08 NOV 82

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM
B UPGRADIENT SITE
C RESULTS ARE FOR UNFILTERED SAMPLE
VALUE EXCEEDS A NATIONAL SECONDARY DRINKING WATER REGULATION CRITERIA

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

CRANE NWSC
Radiochemistry Results

Well	Date	Gross Alpha	Gross Beta	Radium-226	Radium-228	Strontium-90	Uranium
9-7	14 Sep 82			0.21			
9-9	14 Sep 82			<0.27			

*- Value exceeds a National Interim Primary Drinking Water Regulation Standard.

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

SAMPLING SITES
RESULTS

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	9-1	9-7	9-4	9-8	9-5	9-3	9-9
WATER LEVELS (A)	06 APR 82		FT	721.8	719.3	707.4		707.0	706.3	
ARSENIC	06 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	06 APR 82	.1	MGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	06 APR 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	06 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
FLUORIDE	06 APR 82	.10	MGL	.14	.36	.10	.13	.12	.14	ND
LEAD	06 APR 82	.010	MGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	06 APR 82	.2	UGL	ND	ND	ND	ND	ND	ND	ND
NO2+NO3 AS N	06 APR 82	.05	MGL	.70	.05	.12	.51	.48	.12	.18
SELENIUM	06 APR 82	.005	MGL	ND	ND	ND	ND	ND	ND	ND
SILVER	06 APR 82	.01	MGL	ND	ND	ND	ND	ND	ND	ND
ENDRIN	06 APR 82	.04	UGL	ND	ND	ND	ND	ND	ND	
LINDANE	06 APR 82	.08	UGL	ND	ND	ND	ND	ND	ND	
TOXAPHENE	06 APR 82	1.6	UGL	ND	ND	ND	ND	ND	ND	
METHOXYCHLOR	06 APR 82	1.6	UGL	ND	ND	ND	ND	ND	ND	
2,4-D	06 APR 82	3.8	UGL	ND	ND	ND	ND	ND	ND	
SILVEX	06 APR 82	.5	UGL	ND	ND	ND	ND	ND	ND	
GROSS ALPHA	06 APR 82	2.79	PCL	1.56	ND	ND	2.52	ND	ND	ND
GROSS BETA	06 APR 82	2.62	PCL	ND	ND	2.33	ND	ND	ND	ND
CHLORIDE	06 APR 82	1.0	MGL	ND	13.0	24.0	17.0	20.1	13.0	10.0
IRON	06 APR 82	.03	MGL	.17	.19	.08	.14	.22	.21	.10
MANGANESE	06 APR 82	.01	MGL	.02	1.45#	.56#	2.07#	.94#	.42#	35.00#
PHENOL	06 APR 82	.01	MGL	.02	ND	ND	ND	ND	.02	.01
SODIUM	06 APR 82	1.	MGL	41.	108.	32.	43.	40.	40.	62.
SULFATE	06 APR 82	5.0	MGL	44.0	460.0#	91.0	130.0	132.0	96.0	220.0
PH(FIELD)	06 APR 82		PH	6.7	6.3#	6.1#	6.1#	6.2#	6.4#	6.1#
PH(FIELD)	06 APR 82		PH	6.7	6.4#	6.1#	6.2#	6.1#	6.4#	6.1#
PH(FIELD)	06 APR 82		PH	6.8	6.4#	6.1#	6.2#	6.2#	6.4#	6.0#
PH(FIELD)	06 APR 82		PH	6.6	6.4#	6.0#	6.2#	6.2#	6.4#	6.1#
SPEC COND	06 APR 82	1.	UMC	461.	1600.	850.	790.	819.	649.	990.
SPEC COND	06 APR 82	1.	UMC	462.	1600.	850.	792.	820.	650.	988.
SPEC COND	06 APR 82	1.	UMC	462.	1600.	850.	791.	820.	650.	990.
SPEC COND	06 APR 82	1.	UMC	463.	1600.	850.	790.	820.	649.	989.
TOC	06 APR 82	1.0	MGL	2.0	3.0	3.0	3.0	3.0	3.0	4.0
TOC	06 APR 82	1.0	MGL	2.0	3.0	3.0	3.0	3.0	3.0	4.0
TOC	06 APR 82	1.0	MGL	2.0	3.0	2.0	3.0	3.0	3.0	3.0
TOC	06 APR 82	1.0	MGL	2.0	3.0	3.0	3.0	3.0	3.0	4.0
TOX	06 APR 82	.010	MGL	ND	.140 C	.025 C	.058 C	.150 C	.061 C	.080 C
TOX	06 APR 82	.010	MGL	.130 C	.130 C	.026 C	.063 C	.140 C	.036 C	.070 C
TOX	06 APR 82	.010	MGL	.150 C	.140 C	.030 C	.054 C	.130 C	.063 C	.064 C
TOX	06 APR 82	.010	MGL	.150 C	.140 C	.026 C	.067 C	.140 C	.060 C	.059 C

RUN DATE: 18 JUN 82

INSTALLATION: CRANE NWSC, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2	9-6	
WATER LEVELS (A)	06 APR 82		FT	717.3	719.2	
ARSENIC	06 APR 82	.010	MGL	ND	ND	
BARIUM	06 APR 82	.1	MGL	ND	ND	
CADMIUM	06 APR 82	.005	MGL	ND	ND	
CHROMIUM	06 APR 82	.010	MGL	ND	ND	
FLUORIDE	06 APR 82	.10	MGL	.10	.26	
LEAD	06 APR 82	.010	MGL	ND	ND	
MERCURY	06 APR 82	.2	UGL	ND	ND	
NO2+NO3 AS N	06 APR 82	.05	MGL	.33	.28	
SELENIUM	06 APR 82	.005	MGL	ND	ND	
SILVER	06 APR 82	.01	MGL	ND	ND	
ENDRIN	06 APR 82	.04	UGL	ND	ND	
LINDANE	06 APR 82	.08	UGL	ND	ND	
TOXAPHENE	06 APR 82	1.6	UGL	ND	ND	
METHOXYCHLOR	06 APR 82	1.6	UGL	ND	ND	
2,4-D	06 APR 82	3.8	UGL	ND	ND	
SILVEX	06 APR 82	.5	UGL	ND	ND	
GROSS ALPHA	06 APR 82	1.37	PCL	2.56	ND	
GROSS BETA	06 APR 82	2.56	PCL	ND	ND	
CHLORIDE	06 APR 82	1.0	MGL	7.0	32.0	
IRON	06 APR 82	.03	MGL	1.81#	3.47#	
MANGANESE	06 APR 82	.01	MGL	35.00#	1.66#	
PHENOL	06 APR 82	.01	MGL	.01	.01	
SODIUM	06 APR 82	1.	MGL	63.	53.	
SULFATE	06 APR 82	5.0	MGL	170.0	140.0	
PH(FIELD)	06 APR 82		PH	6.0#	5.9#	
PH(FIELD)	06 APR 82		PH	6.1#	5.9#	
PH(FIELD)	06 APR 82		PH	6.1#	5.9#	
PH(FIELD)	06 APR 82		PH	6.1#	5.8#	
SPEC COND	06 APR 82	1.	UMC	870.	630.	
SPEC COND	06 APR 82	1.	UMC	870.	629.	
SPEC COND	06 APR 82	1.	UMC	869.	630.	
SPEC COND	06 APR 82	1.	UMC	870.	630.	
TOC	06 APR 82	1.0	MGL	5.0	1.0	
TOC	06 APR 82	1.0	MGL	5.0	1.0	
TOC	06 APR 82	1.0	MGL	5.0	1.0	
TOC	06 APR 82	1.0	MGL	5.0	1.0	
TOX	06 APR 82	.010	MGL	ND	.063	C
TOX	06 APR 82	.010	MGL	ND	.061	C
TOX	06 APR 82	.010	MGL	ND	.049	C
TOX	06 APR 82	.010	MGL	ND	.064	C

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-1	9-7	9-4	9-8	9-5	9-3	9-9
WATER LEVELS A	13 DEC 81		FT	719.82	719.12	706.73		704.22	705.48	
ARSENIC	14 DEC 81	.010	MGL	ND	ND	ND	ND	ND	ND	ND
BARIUM	14 DEC 81	.1	MGL	ND	ND	ND	ND	ND	ND	ND
CADMIUM	14 DEC 81	.005	MGL	ND	ND	ND	ND	ND	ND	ND
CHROMIUM	14 DEC 81	.010	MGL	ND	ND	ND	ND	ND	ND	ND
FLUORIDE	14 DEC 81	.10	MGL	.17	.40	.16	.16	.16	.14	.11
LEAD	14 DEC 81	.010	MGL	ND	ND	ND	ND	ND	ND	ND
MERCURY	14 DEC 81	.2	UGL	ND	ND	ND	ND	ND	ND	ND
NO2+NO3 AS N	14 DEC 81	.05	MGL	.77	.10	.22	ND	.23	.07	.11
SELENIUM	14 DEC 81	.005	MGL	ND	.025 *	ND	ND	ND	ND	ND
SILVER	14 DEC 81	.01	MGL	ND	ND	ND	ND	ND	ND	ND
ENDRIN	14 DEC 81	.04	UGL	ND	ND	ND	ND	ND	ND	ND
LINDANE	14 DEC 81	.08	UGL	ND	ND	ND	ND	ND	ND	ND
TOXAPHENE	14 DEC 81	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
METHOX/CHLOR	14 DEC 81	1.6	UGL	ND	ND	ND	ND	ND	ND	ND
2,4-D	14 DEC 81	3.8	UGL	ND	ND	ND	ND	ND	ND	ND
SILVEX	14 DEC 81	.5	UGL	ND	ND	ND	ND	ND	ND	ND
GROSS ALPHA	14 DEC 81	4.91	PCL	ND	ND	ND	ND	ND	ND	ND
GROSS BETA	14 DEC 81	1.51	PCL	1.62	1.22	5.38	6.73	4.14	ND	2.75
TOTCOLBACT	15 DEC 81	1.	PHM	97. *	56. *	6. *	5. *	19. *	116. *	175. *
CHLORIDE	14 DEC 81	1.0	MGL	3.4	15.8	18.3	27.3	24.2	14.5	21.9
IRON	14 DEC 81	.03	MGL	ND	.05	ND	.21	.14	.26	.83 *
MANGANESE	14 DEC 81	.01	MGL	.02	.63 *	2.10 *	4.11 *	4.40 *	.21 *	15.40 *
PHENOL	14 DEC 81	.01	MGL	ND	ND	ND	ND	ND	ND	ND
SODIUM	14 DEC 81	1.	MGL	26.	156.	25.	25.	25.	35.	22.
SULFATE	14 DEC 81	5.0	MGL	36.1	659.0 *	157.0	126.0	169.0	93.4	169.0
PH(FIELD)	14 DEC 81		PH	6.8	6.6	6.7	6.4	6.5	6.5	6.6
PH(FIELD)	14 DEC 81		PH	6.8	6.6	6.7	6.5	6.5	6.5	6.6
PH(FIELD)	14 DEC 81		PH	6.8	6.6	6.7	6.5	6.5	6.5	6.6
PH(FIELD)	14 DEC 81		PH	6.7	6.6	6.7	6.5	6.4	6.5	6.5
SPEC COND	14 DEC 81	1.	UMC	510.	1700.	1000.	880.	950.	770.	1000.
SPEC COND	14 DEC 81	1.	UMC	510.	1700.	1010.	880.	950.	780.	1000.
SPEC COND	14 DEC 81	1.	UMC	520.	1700.	1010.	880.	950.	780.	1000.
SPEC COND	14 DEC 81	1.	UMC	510.	1700.	1010.	880.	950.	770.	1000.
TOC	14 DEC 81	1.0	MGL	3.0	5.0	4.0	9.0	4.0	4.0	3.0
TOC	14 DEC 81	1.0	MGL	3.0	4.0	4.0	9.0	4.0	5.0	4.0
TOC	14 DEC 81	1.0	MGL	3.0	5.0	4.0	9.0	4.0	4.0	4.0
TOC	14 DEC 81	1.0	MGL	3.0	4.0	5.0	8.0	4.0	4.0	4.0

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-1	9-7	9-4	9-8	9-5	9-3	9-9
TOX	14 DEC 81	10.	UGL	12.C	ND	27.C	64.C	96.C	343.C	50.C
TOX	14 DEC 81	10.	UGL	25.C	11.C	23.C	69.C	37.C	255.C	42.C
TOX	14 DEC 81	10.	UGL	43.C	17.C	21.C	65.C	22.C	225.C	42.C
TOX	14 DEC 81	10.	UGL	12.C	22.C	40.C	65.C	33.C	228.C	43.C

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES; TRAILING ZEROES DO NOT ALWAYS INDICATE SIGNIFICANCE, BUT ARE THE RESULTS OF COMPUTER FORMATTING.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

C RESULTS ARE FOR UNFILTERED SAMPLE

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2	9-6
WATER LEVELS A	13 DEC 81		FT	715.20	717.35
ARSENIC	14 DEC 81	.010	MGL	ND	ND
BARIUM	14 DEC 81	.1	MGL	ND	ND
CADMIUM	14 DEC 81	.005	MGL	ND	ND
CHROMIUM	14 DEC 81	.010	MGL	ND	ND
FLUORIDE	14 DEC 81	.10	MGL	.12	.29
LEAD	14 DEC 81	.010	MGL	ND	ND
MERCURY	14 DEC 81	.2	UGL	ND	ND
NO2+NO3 AS N	14 DEC 81	.05	MGL	.08	.10
SELENIUM	14 DEC 81	.005	MGL	.013 *	ND
SILVER	14 DEC 81	.01	MGL	ND	ND
ENDRIN	14 DEC 81	.04	UGL	ND	ND
LINDANE	14 DEC 81	.08	UGL	ND	ND
TOXAPHENE	14 DEC 81	1.6	UGL	ND	ND
METHOXYCHLOR	14 DEC 81	1.6	UGL	ND	ND
2,4-D	14 DEC 81	3.8	UGL	ND	ND
SILVEX	14 DEC 81	.5	UGL	ND	ND
GROSS ALPHA	14 DEC 81	4.17	PCL	ND	ND
GROSS ALPHA	14 DEC 81	4.17	PCL		ND
GROSS BETA	14 DEC 81	1.30	PCL	3.45	1.30
GROSS BETA	14 DEC 81	1.30	PCL		2.39
TOTCOLBACT	15 DEC 81	1.	PHM	13. *	3. *
CHLORIDE	14 DEC 81	1.0	MGL	12.4	34.1
IRON	14 DEC 81	.03	MGL	.06	4.36 *
MANGANESE	14 DEC 81	.01	MGL	34.50 *	3.20 *
PHENOL	14 DEC 81	.01	MGL	ND	ND
SODIUM	14 DEC 81	1.	MGL	58.	42.
SULFATE	14 DEC 81	5.0	MGL	316.0 *	186.0
PH(FIELD)	14 DEC 81		PH	6.5	6.3 *
PH(FIELD)	14 DEC 81		PH	6.5	6.3 *
PH(FIELD)	14 DEC 81		PH	6.5	6.3 *
PH(FIELD)	14 DEC 81		PH	6.5	6.3 *
SPEC COND	14 DEC 81	1.	UMC	1000.	860.
SPEC COND	14 DEC 81	1.	UMC	1000.	860.
SPEC COND	14 DEC 81	1.	UMC	1000.	860.
SPEC COND	14 DEC 81	1.	UMC	1000.	840.
TOC	14 DEC 81	1.0	MGL	9.0	2.0
TOC	14 DEC 81	1.0	MGL	9.0	2.0
TOC	14 DEC 81	1.0	MGL	8.0	2.0
TOC	14 DEC 81	1.0	MGL	9.0	2.0

RUN DATE: 05 MAR 82

INSTALLATION: CRANE AAA, IN

FACILITY: PEST CONTROL STORAGE AREA

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 9-2	9-6
TOX	14 DEC 81	10.	UGL	30.C	15.C
TOX	14 DEC 81	10.	UGL	23.C	ND
TOX	14 DEC 81	10.	UGL	28.C	12.C
TOX	14 DEC 81	10.	UGL	29.C	ND

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMETAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES; TRAILING ZEROES DO NOT ALWAYS INDICATE SIGNIFICANCE, BUT ARE THE RESULTS OF COMPUTER FORMATTING.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

C RESULTS ARE FOR UNFILTERED SAMPLE

SITE 10

AQUA TECH
ENVIRONMENTAL
CONSULTANTS, INC.

P.O. BOX 76, STATE ROUTE 100, MELMORE, OHIO 44845, (419) 397-2222

*Address Reply to this Office.

* P.O. BOX 436, 181 S. MAIN ST., MARION, OHIO 43302, (614) 382-5991

G0160

May 9, 1985

Commanding Officer
Naval Weapons Support Center
Attn: Ms. Cathy Andrews
Crane, IN 47522
Code 0924

Dear Ms. Andrews:

As you requested, I am reporting the analytical data for the groundwater sample collected from Well No. 10-9 on January 16, 1985.

ATEC LAB NO.	323-85
WELL NO.	10-9
DATE SAMPLED	1/16/85
TNT, mg/l	< 0.005
HMX, mg/l	< 0.05
RDX, mg/l	< 0.010

The above data were omitted in our report dated March 22, 1985.

Sincerely,

Jeffrey A. Smith

Jeffrey A. Smith
Laboratory Manager

bjs

Table XV. Crane Naval Weapons Support Center. January 1985
Groundwater Sampling Project. Area 10-CERCLA

ATEC Lab No.	319-85	320-85	512-85	321-85
Well No.	10-1	10-2	10-3	10-4
Date Sampled	1/16/85	1/16/85	1/16/85	1/16/85
TNT, mg/l	<0.005	<0.005	<0.005	<0.005
HMX, mg/l	<0.05	<0.05	<0.05	<0.05
RDX, mg/l	0.024	0.070	<0.01	<0.01

ATEC Lab No.	322-85	513-85	514-85	515-85
Well No.	10-5	10-6	10-7	10-8
Date Sampled	1/16/85	1/30/85	1/30/85	1/30/85
TNT, mg/l	<0.005	<0.005	0.023	0.029
HMX, mg/l	<0.05	<0.05	0.104	<0.05
RDX, mg/l	<0.01	<0.010	0.072	0.113

ATEC Lab No.	324-85	517-85	518-85	326-85
Well No.	10-10	10-11	10-12	10-13
Date Sampled	1/16/85	1/30/85	1/30/85	1/16/85
TNT, mg/l	<0.005	<0.005	<0.005	<0.005
HMX, mg/l	<0.05	<0.05	<0.05	<0.05
RDX, mg/l	<0.010	<0.010	<0.010	<0.010

Table XV. (Cont'd.) Crane Naval Weapons Support Center. January 1985 Groundwater Sampling Project. Area 10-CERCLA

ATEC Lab No.	520-85	521-85	522-85	523-85
Well No.	10-15	10-16	10-17	10-18
Date Sampled	1/30/85	1/30/85	1/30/85	1/30/85
TNT, mg/l	<0.005	<0.005	0.005	4.85
HMX, mg/l	<0.05	<0.05	<0.05	0.765
RDX, mg/l	<0.010	<0.010	0.014	6.19

ATEC Lab No.	524-85	525-85	526-85	326-85
Well No.	10-19	10-20	10-21	10-22
Date Sampled	1/30/85	1/30/85	1/30/85	1/16/85
TNT, mg/l	<0.005	<0.005	<0.005	<0.005
HMX, mg/l	<0.05	<0.05	<0.05	<0.05
RDX, mg/l	0.026	<0.010	<0.010	<0.010

Original Copy in Sample Results Book

ANALYTICAL INFORMATION
NAVWPNSUPPCEN, CRANE SAMPLES

LABORATORY Aqua Tech

ADDRESS 181 S. Main Street, Marion, OH 43302

LABORATORY CONTACT J. A. Smith

PHONE 614-382-5991

DATE SAMPLES RECEIVED 11/8/84 Cont. NUMBER OF SAMPLES

RECEIVED BY M. Blank

ANALYSIS PERFORMED	ANALYTICAL METHOD	DATES OF ANALYSES	NAME(S) OF ANALYST(S)	RES mg
11074 RKY 10-1-83 TNT	"	"	"	0.
HMX	"	"	"	0.
RDX	"	"	"	0.
11074 RKY 10-2-83 TNT	"	"	"	0.
HMX	"	"	"	0.
RDX	"	"	"	0.

I certify that quality control measures were incorporated for these samples in accordance with the Quality Control Plan submitted to a NAVWPNSUPPCEN, Crane, IN.

Signature of Laboratory Representative Jeffrey A. Smith

(Type/print name underneath signature block) Jeffrey A. Smith

DATE December 10, 1984

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V7479 - COMMANDER

07-24-84

CLIENT I.D.: RW 10-1
ERG SAMPLE NO: 06/110447
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	<2	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	0.02	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	230	umho/c
pH, FIELD,	7.6	S.U.
RDX (BY HPLC)	31	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: RW 10-2
ERG SAMPLE NO: 06/110448
MATRIX: GROUND WATER
DATE COLLECTED: 06-14-84

PARAMETER	RESULTS	UNITS
CARBON, TOTAL ORGANIC,	5	mg/L
HALOSCAN - T		
ORGANIC CHLORIDE	ND (0.01)	mg/L
ORGANIC BROMIDE	0.007	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CONDUCTANCE, SPECIFIC	290	umho/

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6798 - COMMANDER

04-30-84

CLIENT I.D.: RW 10-1 (A)
ERG SAMPLE NO: 02/102443
MATRIX: NATURAL WATER
DATE COLLECTED: 02-02-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T ORGANIC CHLORIDE	ND (0.01)	mg/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. V6998 - COMMANDER 04-30-84

CLIENT I.D.: RW 10-1 (A)
ERG SAMPLE NO: 02/102443
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	ND (0.002)	mg/L
CARBON, TOTAL ORGANIC,	2	mg/L
CONDUCTANCE, SPECIFIC	270	umho/cm
pH, FIELD,	7.0	S.U.
RDX (BY HPLC)	77	ug/L
HMX (BY HPLC)	13	ug/L
TNT (TRINITROTOLUENE)	9.0	ug/L
CHLORIDE	10	mg/L
IRON, TOTAL	<0.01	mg/L
MANGANESE, TOTAL	0.025	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	6.2	mg/L
SULFATE	18	mg/L

CLIENT I.D.: RW 10-2 (A)
ERG SAMPLE NO: 02/102447
MATRIX: NATURAL WATER
DATE COLLECTED: 02-03-84

PARAMETER	RESULTS	UNITS
HALOSCAN - T		
ORGANIC CHLORIDE	0.01	mg/L
ORGANIC BROMIDE	ND (0.002)	mg/L
ORGANIC IODINE	0.002	mg/L
CARBON, TOTAL ORGANIC,	ND (2)	mg/L
CONDUCTANCE, SPECIFIC	160	umho/cm
pH, FIELD,	6.6	S.U.
RDX (BY HPLC)	110	ug/L
HMX (BY HPLC)	13	ug/L
TNT (TRINITROTOLUENE)	50	ug/L
CHLORIDE	12	mg/L
IRON, TOTAL	0.12	mg/L
MANGANESE, TOTAL	<0.005	mg/L
PHENOLS	ND (0.004)	mg/L
SODIUM, TOTAL	7.7	mg/L
SULFATE	28	mg/L

CONTINUED

Commander
Naval Weapons Support Center
Crane, Indiana 47522

Attn: Ms. Cathy Andrews

Date: March 15, 1984

Results reported in µg/l

ERG Project Number: 7048.3

ERG Sample #	Crane Sample #	EXPLOSIVES HMX	TNT	RDX
23,736	WES 101783	ND-500	3,800	ND-500
23,737	WES 101883	26	ND-10	26
23,738	WES 102183		ND-10	

ND-non-detectable; detection limits are shown next to "ND" notations.

Commander
Naval Weapons Support Center
Crane, Indiana 47522

Attn: Ms. Cathy Andrews

Samples Received: 12/27/83

Date: January 31, 1984

Project Number: 6945.3

Results reported in mg/l
except where noted.

ERG-Cleve Sample ID	Crane Sample ID	Iron	Total Dissolved Solids	Hardness	Chloride	Chemical Oxygen Demand	EXPLOSIVES TNT*	HMX*	RDX*
23,385	WES10-9-21123	-----	---	---	----	----	ND-10	ND-10	ND-10
23,386	WES10-10-21123	-----	---	---	----	----	ND-10	ND-10	ND-10
23,387	WES10-7-21123	-----	---	---	----	----	ND-10	ND-10	ND-10
23,388	WES10-8-19123	-----	---	---	----	----	60	98	140
23,389	WES10-18-19123	-----	---	---	----	----	ND-10	37	22
23,390	WES10-19-19123	-----	---	---	----	----	ND-10	ND-10	ND-10

ND-non-detectable. Detection limits are shown next to "ND" notations.

*Explosives are reported in µg/l

Commander
Naval Weapons Support Center
Crane, Indiana 47522

Date: November 18, 1983

Project Number: 6752.3

Attn: Ms. Cathy Andrews

Samples Received: 10/14/83

EXPLOSIVES(ug/l)	22,663 WES-10-14B-83	22,664 WES-10-17-83
HMX	ND-10	650
TNT	ND-10	2,900
RDX	ND-10	7,200
ORGANICS*		
Methylene Chloride	-----	-----
1,1,1-Trichloro-ethane	-----	-----
1,1,1-Trichloro-ethylene	-----	-----
Organic Chloride	-----	-----
Organic Bromide	-----	-----
Organic Iodine	-----	-----
INORGANICS (mg/l)		
Arsenic	-----	-----
Barium	-----	-----
Selenium	-----	-----
Mercury	-----	-----
Cadmium	-----	-----
Chromium	-----	-----
Hexavalent Chromium	-----	-----
Lead	-----	-----
Silver	-----	-----
Magnesium	-----	-----
Aluminum	-----	-----
Zinc	-----	-----
Nitrate-N	-----	-----
Nitrite	-----	-----
Total Organic Carbon	-----	-----
Chloride	-----	-----
Copper	-----	-----
Cyanide	-----	-----
Sulfide	-----	-----
pH (S.U.)	-----	-----
Total Phosphorus	-----	-----

*Methylene Chloride, 1,1,1-Trichloroethane, and 1,1,1-Trichloroethylene are reported in ug/l. Organic Chloride, Bromide, and Iodine are reported in mg/l.

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-9 - COMMANDER 11-15-83

CLIENT I.D.: WES-10-22-83
ERG SAMPLE NO: 09/096081
MATRIX: NATURAL WATER
DATE COLLECTED: 09-21-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-9 - COMMANDER 11-15-83

CLIENT I.D.: WES-10-19-83
ERG SAMPLE NO: 09/096077
MATRIX: NATURAL WATER
DATE COLLECTED: 09-21-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	25	ug/L
HMX (BY HPLC)	120	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES-10-19-83
ERG SAMPLE NO: 09/096078
MATRIX: NATURAL WATER
DATE COLLECTED: 09-21-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES-10-20-83
ERG SAMPLE NO: 09/096079
MATRIX: NATURAL WATER
DATE COLLECTED: 09-21-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	10	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES-10-21-83
ERG SAMPLE NO: 09/096080
MATRIX: NATURAL WATER
DATE COLLECTED: 09-21-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-9 - COMMANDER 11-15-83

CLIENT I.D : WES-10-16-83
ERG SAMPLE NO: 09/096076
MATRIX: NATURAL WATER
DATE COLLECTED. 09-21-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CONTINUED

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. A69-98 - COMMANDER 10-10-83

CLIENT I.D.: WES-10-10-83
ERG SAMPLE NO: 09/095399
MATRIX: NATURAL WATER
DATE COLLECTED: 09-06-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES-10-11-83
ERG SAMPLE NO. 09/095400
MATRIX: NATURAL WATER
DATE COLLECTED. 09-07-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES-10-12-83
ERG SAMPLE NO: 09/095401
MATRIX: NATURAL WATER
DATE COLLECTED: 09-07-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES-10-13-83
ERG SAMPLE NO: 09/095402
MATRIX: NATURAL WATER
DATE COLLECTED: 09-07-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. A69-98 - COMMANDER 10-10-83

CLIENT I.D.: WES-10-14-83
ERG SAMPLE NO: 09/095403
MATRIX: NATURAL WATER
DATE COLLECTED: 09-07-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES-10-15-83
ERG SAMPLE NO. 09/095404
MATRIX: NATURAL WATER
DATE COLLECTED: 09-07-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

117 N. FIRST
ANN ARBOR, MICHIGAN 48104 (313) 663-7164

PROJECT A69-9B
REPORT DATE 10-10-83

CLIENT P.O.: N62472-82-C-6497
REPORT: 3393

SAMPLES RECVD. 09-09-83
REFER TECHNICAL QUESTIONS
TO: JAMES ENDRES

APPROVED: James J. Kolyer

CLIENT:
COMMANDER
CRANE N.W.S.C.
CODE 0924 CATHY ANDRENS
CRANE, INDIANA 47522

ATTENTION: CATHY ANDRENS

***
RESIDUAL SAMPLES WILL
BE HELD FOR TWO WEEKS
***

CLIENT I.D.: WES-10-7-83
ERG SAMPLE NO: 09/095396
MATRIX: NATURAL WATER
DATE COLLECTED: 09-06-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	350	ug/L
HMX (BY HPLC)	40	ug/L
TNT (TRINITROTOLUENE)	160	ug/L

CLIENT I.D.: WES-10-8-83
ERG SAMPLE NO: 09/095397
MATRIX: NATURAL WATER
DATE COLLECTED: 09-06-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	62	ug/L
HMX (BY HPLC)	11	ug/L
TNT (TRINITROTOLUENE)	34	ug/L

CLIENT I.D.: WES-10-9-83
ERG SAMPLE NO. 09/095398
MATRIX: NATURAL WATER
DATE COLLECTED: 09-06-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-7 - COMMANDER 08-22-83

CLIENT I.D.: WES10-3-12073
ERG SAMPLE NO: 07/092691
MATRIX: NATURAL WATER
DATE COLLECTED: 07-12-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (20)	ug/L
HMX (BY HPLC)	ND (20)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-7 - COMMANDER 08-22-83

CLIENT I.D.: WES10-4-12073
ERG SAMPLE NO: 07/092692
MATRIX: NATURAL WATER
DATE COLLECTED: 07-12-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (20)	ug/L
HMX (BY HPLC)	ND (20)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES10-5-12073
ERG SAMPLE NO: 07/092693
MATRIX: NATURAL WATER
DATE COLLECTED. 07-12-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (20)	ug/L
HMX (BY HPLC)	ND (20)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES10-6-12073
ERG SAMPLE NO: 07/092694
MATRIX: NATURAL WATER
DATE COLLECTED: 07-12-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (20)	ug/L
HMX (BY HPLC)	ND (20)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-7 - COMMANDER 08-22-83

CLIENT I.D.: WES107-27073
ERG SAMPLE NO: 07/093231
MATRIX: NATURAL WATER
DATE COLLECTED: 07-27-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	180	ug/L
HMX (BY HPLC)	83	ug/L
TNT (TRINITROTOLUENE)	76	ug/L

CLIENT I.D.: WES108-27073
ERG SAMPLE NO. 07/093232
MATRIX: NATURAL WATER
DATE COLLECTED: 07-27-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	150	ug/L
HMX (BY HPLC)	46	ug/L
TNT (TRINITROTOLUENE)	22	ug/L

 SEE LAST PAGE FOR EXPLANATION OF SYMBOLS

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-7 - COMMANDER 08-22-83

CLIENT I.D.: WES109-27073
ERG SAMPLE NO: 07/093233
MATRIX: NATURAL WATER
DATE COLLECTED. 07-27-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	120	ug/L
HMX (BY HPLC)	24	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CLIENT I.D.: WES1010-27073
ERG SAMPLE NO: 07/093234
MATRIX: NATURAL WATER
DATE COLLECTED: 07-27-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (20)	ug/L
HMX (BY HPLC)	ND (20)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

FR - SEE FIELD REPORT FOR RESULT
NA - NOT APPLICABLE TO TEST REQUESTED
ND - NONDETECTED, DETECTION LIMIT IN ()
SD - SAMPLE DAMAGED
SR - SEE ATTACHED REPORT FOR RESULT
< - POSITIVE RESULT BUT AT UNQUANTIFIABLE CONCENTRATION BELOW INDICATED LEVEL

THANK YOU FOR YOUR BUSINESS !

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

Incl 10

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: SITE 10

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 10-1	10-2
WATER LEVELS (A)	02 AUG 83		FT	602.6	602.2
PH(FIELD)	02 AUG 83		PH	7.0	6.5
PH(FIELD)	02 AUG 83		PH	6.9	6.5
PH(FIELD)	02 AUG 83		PH	6.9	6.5
PH(FIELD)	02 AUG 83		PH	7.0	6.5
2,4,6-TNT	02 AUG 83	100.	UGL	ND	ND
2,4-DNT	02 AUG 83	100.	UGL	ND	ND
2,6-DNT	02 AUG 83	100.	UGL	ND	ND
RDX	02 AUG 83	100.	UGL	ND	255.
HMX	02 AUG 83	100.	UGL	ND	ND
TETRYL	02 AUG 83	100.	UGL	ND	ND

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN SITE: SITE 10

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

HSHB-ES-G/WP
SUBJECT: Ground-water Monitoring Results for Naval Weapons Support Center (NWSC), Crane, IN

Incl 11

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN

SITE: SITE 10

PARAMETER	SAMPLING DATE	DETECTION LIMIT	UNITS	SAMPLING SITES RESULTS 10-1	10-2
WATER LEVELS (A)	02 MAR 83		FT	602.3	601.2
PH(FIELD)	02 MAR 83		PH	7.2	6.2
PH(FIELD)	02 MAR 83		PH	7.2	6.1
PH(FIELD)	02 MAR 83		PH	7.1	6.1
PH(FIELD)	02 MAR 83		PH	7.1	6.0
2,4,6-TNT	02 MAR 83	100.	UGL	ND	ND
2,4-DNT	02 MAR 83	100.	UGL	ND	ND
2,6-DNT	02 MAR 83	100.	UGL	ND	ND
RDX	02 MAR 83	100.	UGL	ND	ND
HMX	02 MAR 83	100.	UGL	ND	ND
TETRYL	02 MAR 83	100.	UGL	ND	ND

RUN DATE: 24 OCT 83

INSTALLATION: CRANE NWSC, IN SITE: SITE 10

LEGEND

NOTES: ALL METALS AND OTHER PARAMETERS WHERE APPROPRIATE ARE ON A DISSOLVED (FILTERED) BASIS UNLESS OTHERWISE NOTED. DETECTION LIMITS SHOWN ARE NORMAL LEVELS; ACTUAL LIMITS MAY VARY IN ENVIRONMENTAL SAMPLES. ANALYTICAL RESULTS ARE ACCURATE TO EITHER 2 OR 3 SIGNIFICANT FIGURES.

A VALUES SHOWN ARE FOR WATER LEVEL ELEVATION ABOVE A REFERENCE DATUM

B UPGRADIENT SITE

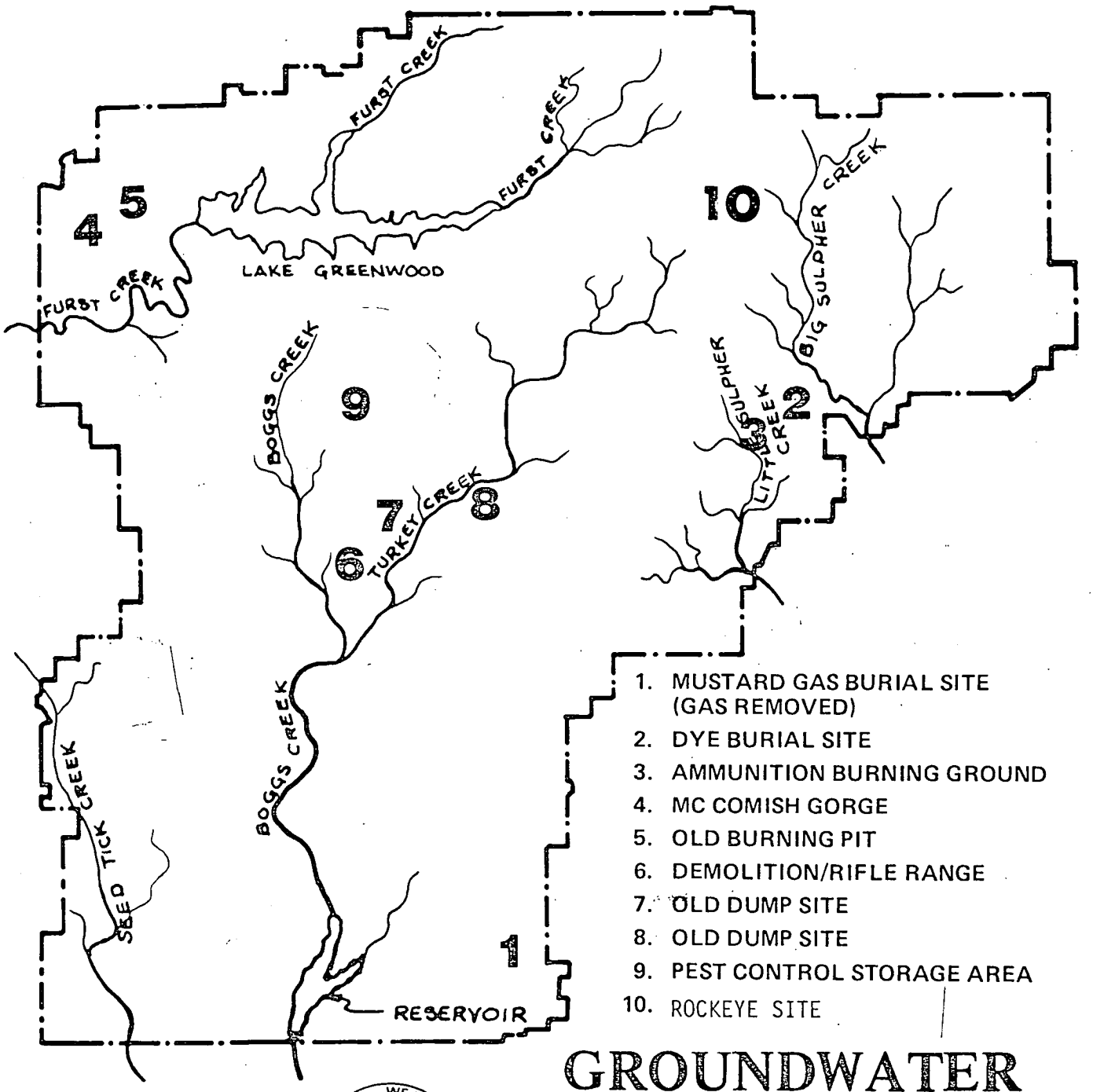
MGL - MILLIGRAMS/LITER
UGL - MICROGRAMS/LITER
PCL - PICOCURIES/LITER
UMC - MICROMHOS/CENTIMETER
NTU - NEPHELOMETRIC TURBIDITY UNITS
TON - THRESHOLD ODOR NUMBER
TDN - TASTE DILUTION INDEX NUMBER
CU - COLOR UNITS
PHM - PER 100 MILLILITERS

APPENDIX D

GROUNDWATER MONITORING PLAN

APPENDIX C

MONITORING WELL LOCATION MAPS



1. MUSTARD GAS BURIAL SITE (GAS REMOVED)
2. DYE BURIAL SITE
3. AMMUNITION BURNING GROUND
4. MC COMISH GORGE
5. OLD BURNING PIT
6. DEMOLITION/RIFLE RANGE
7. OLD DUMP SITE
8. OLD DUMP SITE
9. PEST CONTROL STORAGE AREA
10. ROCKEYE SITE

GROUNDWATER MONITORING SITES

NAVAL WEAPONS SUPPORT CENTER

NAVAL WEAPONS CRANE SUPPORT CENTER

APPENDIX F

REQUEST FOR ENVIRONMENTAL RESTORATION FUNDS

N Dupe Smith

JOINT MESSAGEFORM

1 3 0800 R U 051822Z Nov 84

FM NAVWPNSUPPCEN CRANE IN

TO COMNAVSEASYSCOM WASHINGTON DC

09

BT

UNCLAS//11010//

SUBJ: PRIDE AND PROFESSIONALISM IN SHORE ACTIVITIES

COMNAVSEASYSCOM ~~PASS TO~~ FOR SEA- 6412

A. COMNAVSEASYSCOM WASHINGTON DC 192102Z OCT 1984

B. COMNAVSEASYSCOM WASHINGTON DC 192315Z OCT 1984

C. TELECON BTWN CDR BILLINGS (OP-442) AND A. SMITH (NWSC 09239) OF 29 OCT 1984

D. NAVWPNSUPPCEN LTR 09233-HES:CJS 11010 OF 22 AUG 1984

1. IRT REF A, B AND C, REF D IS GERMANE. ADDITIONALLY, FOLLOWING PROJECTS ARE PRIORITIZED FOR CONSIDERATION:

PROJ NAME	PRI	BLDG NO	JUSTIFICATION	COST
1. DEMOLITION	1-24	(SEE REF D)	SAFETY HAZARD	$480K
2. LANDSCAPING				
A. MAGNESIUM DISPOSAL GROUNDS	25	2993	UNSIGHTLY	$50K
B. LANDFILL	26		UNSIGHTLY	$50K

J. D. FARIS, 092, EXT 1480

J D Faris 31 OCT 1984

F. V. BERNHARD
LCDR, CEC, USN
Assistant Public Works Officer

U

NAME	PRI	BLDG NO	JUSTIFICATION	COST
C. CANNISTER STG	27	101	UNSIGHTLY	$50K
3. ENVIRONMENTAL				
A. BURNING GRD WASTE ASH PILE CLOSURE	28		HAZARDOUS	$1.3M
B. RESTORATION OF QUALITY OF DEGREASER/ EXPLOSIVE CONTAMINATED GROUNDWATER BURNING GRD AREA	29		HAZARDOUS	$420K
C. RESTORATION OF QUALITY OF DEGREASER CONTAMINATED WATER AT RESTORED MUSTARD GAS BURIAL SITE	30		HAZARDOUS	$345K
D. RESTORATION OF DEGREASER COMTAMINATED GROUNDWATER AT OLD BURN PIT AREA	31		HAZARDOUS	$333K
E. RESTORATION OF DEGREASTER COMTAMINATED GROUNDWATER AT EXHUMED LIQUID WASTE SITE	32		HAZARDOUS	$218K

J. D. FARIS, 092, EXT 1480

JDFaris 31 OCT 1984

New Landscape Contract $150K Put on report. Requires Step II

ROUTINE

013/1629Z

RTTUZYUW RULSSGG9703 0141628-UUUU--RUCINDA.
ZNR UUUUU
R 141640Z JAN 85
FM COMNAVSEASYSCOM WASHINGTON DC
TO RUEDEOA/NAVORDSTA LOUISVILLE KY
RUCINDA/NAVWPNSUPPCEN CRANE IN
RUEORBA/NAVORDSTA INDIAN HEAD MD
RUWMHNA/WPNSTA CONCORD CA
RUEDEMA/WPNSTA EARLE COLTS NECK NJ
RUWDWAA/WPNSTA SEAL BEACH CA
RUEBNUY/WPNSTA YORKTOWN VA
BT
UNCLAS //N11000//
SUBJ: PRIDE AND PROFESSIONALISM OF THE SHORE ESTABLISHMENT
A. CHNAVMAT LTR 11000 SER 04HB/5013 OF 10 JAN 85 (NOTAL)
B. OPNAVINST 11010.20D
1. REF (A) PROVIDED A LISTING OF THE CNO APPROVED FY 85 O&M,N ENVIRONMENTAL RESTORATION FUND PROJECTS FOR BASE EXTERIOR ARCHITECTURE PLANS. THE FOLLOWING PROJECTS WERE APPROVED:

ACTIVITY	PROJECT DESCRIPTION	($000) COST
NOS LOUISVILLE	MAIN GATE & SECONDARY GATE	50

PAGE 02 RULSSGG9703 UNCLAS

	PAINT SECURITY FENCE & ADD COLUMNS	125
	LUNCH PAVILIONS	200
NWSC CRANE	LANDSCAPE MAGNESIUM DISPOSAL AREA	50
	LANDSCAPE LANDFILL	50
	LANDSCAPE CANISTER STORAGE AREA	50
NOS INDIAN HEAD	STATION ENTRANCE	180
	LANDSCAPE BLDG 2008	25
WPNSTA CONCORD	ALTERATIONS TO MAIN GATE AREA	198
	STATION SIGNAGE PROGRAM	48
	PARADE GROUND - PLANTING	79
WPNSTA EARLE	IMPROVEMENTS TO MAIN GATE AREA	200
	OFFICER'S CLUB	16
	SECONDARY ENTRANCE	5
WPNSTA SEAL BEACH	MAIN GATE	200
	FALLBROOK ANNEX	200
	CORONA ANNEX	200
WPNSTA YORKTOWN	LANDSCAPE DEVELOPED AREAS	200
	IMPROVE FOUNDATION PLANTING	200
	STATION SIGNAGE PROGRAM	200

2. RESOURCES WILL BE PROVIDED BY NAVFACENGCOM TO THE APPROPRIATE

PAGE 03 RULSSGG9703 UNCLAS
ENGINEERING FIELD DIVISION (EFD) FOR CONTRACT AWARD.
3. PLEASE PREPARE STEP II PROJECT DOCUMENTATION IAW REF (B) AND SUBMIT VIA EFD WITH ADVANCE COPIES TO CNO (OP-44), CHNAVMAT (MAT-04H), AND MR. D. W. ANDERSON (SEA 64121).

ROUTINE

4. FY 85 O&M,N FUNDS HAVE BEEN AUTHORIZED AND WILL REQUIRE PROJECTS UNDER CONTRACT BY 15 SEP 85. PLEASE MAKE SPECIAL EFFORT TO EFFECT EARLY CONTRACT AWARD. EARLIEST CONTRACT AWARD IS MOST IMPORTANT TO CONTINUED SUPPORT OF THIS PROGRAM.
BT
#9703

NNNN

APPENDIX G

R-150 TANK CLOSURE/ANALYSES UNDER INTERIM STATUS

PLAN FOR THE CLOSURE OF THE R-150 TANK SITE, NWSC CRANE, BY THE INTERIM STATUS STANDARDS OF 40CFR 265.

CLOSURE.

[265.110]. Applicability.

(a) This closure plan pertains to the tank at Storage Lot R-150 on the premises of NWSC Crane.

(b) Post-closure requirements do not apply because the tank is not a disposal facility.

[265.111]. Closure Performance Standard.

(a) Closure of the tank will negate the need for further maintenance because the tank will be removed and transported to a RCRA permitted facility off-NWSC Crane for final management.

(b) Human health and the environment will be protected from the effects of the tank because the tank site will be decontaminated and will be certified "clean" by sampling and analysis.

[265.112]. Amendment of the Plan.

(a) NWSC Crane will keep this closure plan and all revisions on the facility until closure is completed and certified.

(1) The tank will be finally closed upon its removal. The term "partial closure" does not apply. The maximum extent which will be unclosed during the operating life of the tank is the tank only. In accordance with 40CFR 265.197, Closure of Tanks, all wastes and waste residues will be removed from the tank and appurtenances at the time of closure.

(2) The estimated maximum amount of wastes in the tank is 37,000 gallons.

(3) The tank and appurtenances will be removed. The tank is below ground; therefore, soil around the tank will be sampled and analyzed for the presence of hazardous waste constituents. Soil will be removed and managed as a hazardous waste, if necessary, to the extent that testing and analysis indicates that the site is "clean."

(4) It is estimated that closure will begin in 1983. Closure operations will be completed within 180 days from the onset.

(b) NWSC Crane will amend this plan within 60 days if any changes in the plan occur.

(c) NWSC Crane will submit this plan to the US EPA Regional Administrator at least 180 days prior to the onset of closure operations.

(d) NWSC Crane will modify this plan or submit a new plan if so directed by the Regional Administrator.

[265.113]. Time Allowed for Closure.

(a) NWSC Crane will remove the tank, all appurtenances, wastes, waste residues, and all other contaminated soils or materials within 90 days from the time the tank is last operated.

(b) Closure will be completed within 180 days after such operations begin.

[265.114]. Disposal or Decontamination of Equipment.

When closure is complete, the tank, all appurtenances, wastes, waste residues, and all other contaminated soils or materials will be transported off-NWSC Crane for management as hazardous waste. All equipment used during closure operations will be decontaminated by an appropriate method. Any decontamination solution or wastes will be containerized and managed as hazardous wastes.

[265.115]. Certificate of Closure.

NWSC Crane will submit to the Regional Administrator certification by both NWSC Crane and a registered professional engineer that the tank has been closed in accordance with the approved closure plan.

POST-CLOSURE.

[265.117]. Post-Closure Care and Use of the Property.

This paragraph and related paragraphs 265.118 through 265.120 do not apply to this closure plan because the tank is not a disposal facility.

[265.197]. Closure of Tanks.

The requirements of this paragraph are addressed in paragraph 265.114 of this closure plan.

ATTACHMENT 2

SYNOPSIS OF ACTIONS TAKEN BY NWSC CRANE TO CLOSE THE R-150 TANK SITE

The following synopsis represents information available concerning the actual closure of the R-150 tank site at NWSC Crane. These actions occurred between May 9, 1983, and January 25, 1984.

May 9 and 10, 1983. NWSC Crane shipped 27,245 gallons of PCB contaminated oil sludge/water from the R-150 tank via DPDO contractor.

August 31, 1983. Collected two soil samples adjacent to the R-150 tank. These two samples were collected around fill pipe and manhole, which should have been the most contaminated areas. These samples were sent to Chemical Waste Management laboratory for analysis.

September 23, 1983. NWSC Crane shipped 4,300 gallons of PCB liquid (greater than 550 PPM) contaminated with 1,1,1 trichloroethane (12 percent for incineration only) to Emelle, Alabama. (Reference Chemical Waste Management Company, Manifest No. 76346).

September 27, 1983. An itemized account follows:

(a) Began excavation to remove R-150 tank.
(b) Shipped 38 c.y. in two loads to Emelle, Alabama. (Manifest Nos. 76347 and 55161)
(c) Stockpiled remainder of R-150 excavation soil in the area adjacent to the tank site.
(d) Collected soil samples around the tank during excavation.

Due to sides of hole caving in, collected soil samples from 3 places.

September 28, 1983. An itemized account follows:

(a) Removed 1,000 gallons of PCB (greater than 500 PPM) contaminated oil (containing 1,1,1 trichloroethane). Shipped to Emelle, Alabama, for incineration.

(b) Replaced excavated material into the hole.

September 29, 1984. Shipped tank by lowboy semitrailer to Chemical Waste Management, Emelle Facility, Emelle, Alabama. Manifest No. 76348.

November 3, 1983. Sampled water in the hole at R-150 where the tank had been.

November 9, 1983. Received "ok" from Illinois EPA on disposal of soil. The Illinois EPA gave approval for disposal of the soil from around the tank at Chemical Waste Management Landfill CID located Calumet City, Illinois. This approval based on analytical results. Illinois EPA Waste Stream #831808.

December 19, 20, and 21, 1983. An itemized account follows:

(a) Pumped approximately 25,000 gallons of water out of hole and hauled to a NWSC Crane sanitary sewer.

(b) Began to remove contaminated dirt from the hole and placed into a bermed area adjacent to the hole.

(c) Approximately 25,000 gallons of water were hauled to a sanitary sewer.

December 21, 1983. Shipped five loads of contaminated soil. Total weight = 116.58 tons. (95 c.y.)

December 22, 1983. Shipped 13 loads of contaminated soil. Total weight = 236.65 tons. (246 c.y.)

December 23, 1983. Shipped two loads of contaminated soil. Total weight = 34.87 tons. (38 c.y.)

January 5, 1984. Shipped three loads of contaminated soil. Total weight = 50 tons. (63 c.y.)

January 6, 1984. Shipped two loads of contaminated soil. Total weight = 20.4 tons. (36 c.y.)

January 9, 1984. Shipped two loads of contaminated soil. Total weight = 43.62 tons. (40 c.y.)

January 25, 1984. Shipped one load of contaminated soil. Total weight = 7.8 tons. (5 c.y.)

Manifests to show "Waste Contaminated Soil -- Hazardous Waste Nos. F001, F002; Hazardous Waste Solids No. ORM-E."

The preceeding synopsis was composed from notes furnished by NWSC Crane.

Fill dirt was obtained on-site and used for fill where contaminated dirt has been excavated.

Visual inspection of soil around tank when excavating site on September 27, 1983, showed very little if any indication of contamination. Areas that showed some indication of contamination were two soil samples. It was felt by Crane and Chemical Waste Management representatives that worst area of contamination was around fill pipes and manhole. Samples were taken there for analysis.

6.1.1 Supplementary Information to R-150 Site Closure Plan

6.2 Amendment 2

FS Smoke Closure Plan

07246

DEPARTMENT OF THE NAVY
NAVAL WEAPONS SUPPORT CENTER
CRANE, INDIANA 47522

IN REPLY REFER TO:
11346/R15.0
09245
24 MAY 1985

Mr. Tom Linson
Indiana State Board of Health
Land Pollution Control Division
1330 West Michigan Street
Indianapolis, Indiana 46206-1964

Dear Mr. Linson:

We are submitting additional information for our R-150 Tank Site Closure Plan as requested in your correspondence of April 29, 1985. We hope that the enclosed information will sufficiently address all issues highlighted in that letter.

NAVWPNSUPPCEN Crane point of contact is Mrs. Cathy Andrews, Code 0924, telephone 812-854-3114.

Sincerely,

J. R. COTTINGHAM
CDR, CEC, USN
Public Works Officer
By direction of the
Commanding Officer

Encl:
(1) Supplementary Information:
R-150 Tank Site Closure

Copy to:
Northern Division, Naval Facilities
Engineering Command (Code 114)

Writer: J. Hunsicker, 09245, X3114
Typist: C. Wade, 23 May 85

SUPPLEMENTARY INFORMATION:
R-150 TANK SITE CLOSURE

Soil Sample Collection Method and Analytical Data:

As tank was being excavated on September 27, 1983, a visual inspection was conducted to locate any areas of visible contamination (dark-oily areas). This visual inspection found two areas on south end of tank that appeared to be contaminated. For location of sampling points see attachment (1).

At sampling points identified as 6 and 7, soil samples were collected, composited and analyzed. As the soil around the tank was excavated using a gradall (truck mounted backhoe), grab samples were collected and composited into three samples from each of these sampling points. Since we calculated the average depth of the tank to be 15 feet, one sample was composited from each 5 feet of depth. Six soil samples were collected from Sampling Points 6 and 7. At Sampling Point 5 a composite soil sample was taken at a depth of 10-15 feet. The analytical results from these seven samples are found in attachment (2).

Because of the excavation method used and the size of the tank involved, contaminated soil from isolated areas could not be adequately segregated from the non-contaminated soil. It was therefore decided that it would be environmentally safer to consider all the soil from the excavation as contaminated and dispose of it as such.

Water Quality Results:

The analytical results for the water sample taken on November 3, 1983, are shown in attachment (3).

Source of Water in Excavation Site and Groundwater Analysis:

The 25,000 gallons of water removed from excavation site on December 19, 20 and 21, 1983, was surface water runoff. In July 1983, prior to excavation of the tank in September, NAVWPNSUPPCEN Crane had the U.S. Army Engineer Waterway Experimental Station do four core borings, one on each side of the tank. Water and soil samples (grab) from the borings were collected and analyzed. The analytical results from these samples collected in July are found in attachments (4) and (5).

In the area around R-150 several groundwater monitoring wells have been installed and sampling/analysis of the groundwater has been done. Attachment (6) shows locations of these groundwater monitoring wells in relationship to the location of the exhumed R-150 tank.

Attachment (7) is analytical results for Total Organic Halides (TOX) from Wells 9-1, 9-3, 9-4 and 9-5 which are located near the area where the R-150 tank had been located. We are continuing to monitor the groundwater at this site at least twice per year.

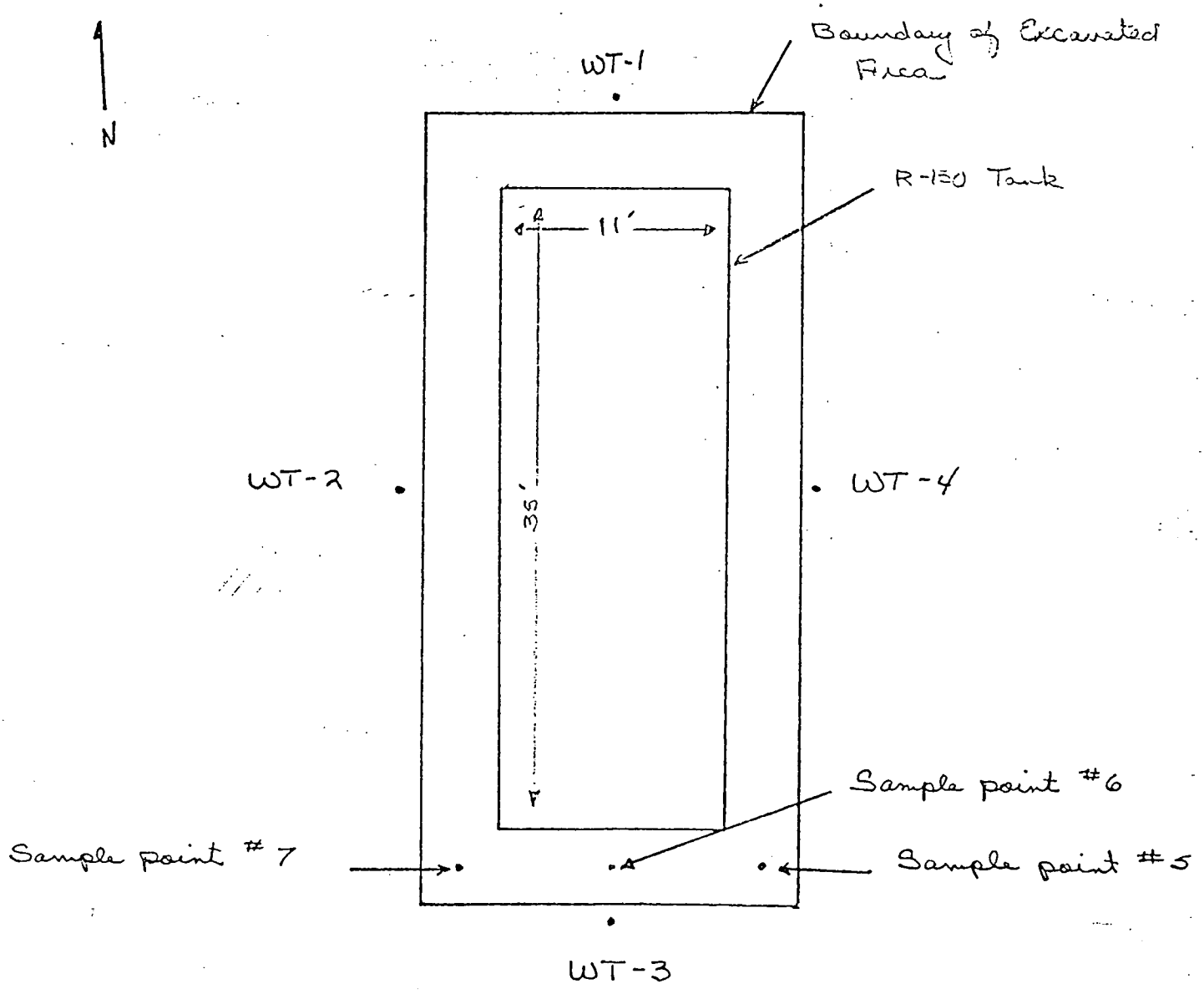
Discrepancies:

The water sampled on November 3, 1983, was surface water runoff which had collected in the depression left from excavating the tank. After excavating and removing the tank on September 27-28, 1983, the remaining contaminated soil was placed back in the excavation site (hole) while waiting for approval from Illinois Environmental Protection Agency to landfill this soil in the Chemical Waste Management Landfill located at Calumet City, Illinois. When the contaminated soil was placed back into the hole a depression was created which collected the surface runoff. In December of 1983, all of the contaminated soil was removed from excavation site (hole) and disposed of in Illinois.

There is a typographical error on Page A2-2. The date the tank was shipped is September 29, 1983, not September 29, 1984.

R-150 TANK

LOCATION OF SAMPLING POINTS



Attachment (1)

Commander
Naval Weapons Support Center
Crane, Indiana 47522

Attn: Ms. Cathy Andrews

Samples Received: 10/07/83

Date: November 18, 1983

Project Number: 6732.3
PAGE-1

Results are reported in mg/l
except where noted.

ERG Sample #	Crane Sample #	Arsenic	Barium	Selenium	Mercury	Cadmium	Chromium	Lead	Silver	Hexavalent Chromium	pH(S.U.)
22,591	R150T-7A-27093	<0.005	<4	<0.005	<0.0003	0.016	<0.005	0.054	0.020	------	---
22,592	R150T-7B-27093	<0.005	<4	<0.005	<0.0003	0.012	0.008	0.054	0.015	------	---
22,593	R150T-7C-27093	<0.005	<4	<0.005	<0.0003	0.005	0.007	<0.010	<0.004	------	---
22,594	R150T-6A-27093	<0.005	<4	<0.005	<0.0003	0.009	<0.005	0.019	0.010	------	---
22,595	R150T-6B-27093	<0.005	<4	<0.005	<0.0003	0.008	0.007	0.018	0.007	------	---
22,596	R150T-6C-27093	<0.005	<4	<0.005	<0.0003	0.007	0.007	0.013	0.006	------	---
22,597	R150T-5C-27093	<0.005	<4	<0.005	<0.0003	0.009	0.007	0.024	0.010	----	---

* Indicates Sampling Point Identification Number
Sample A - 1' to 5'
Sample B - 5' to 10'
Sample C - 10' to 15'

** EP Toxicity analysis run on all samples.

Attachment (2)

Commander
Naval Weapons Support Center
Crane, Indiana 47522

Attn: Ms. Cathy Andrews

Samples Received: 10/07/83

Date: November 18, 1983

Project Number: 6732.3
PAGE-2

Results are reported in µg/l

ERG Sample #	Crane Sample #	Total PCB	PCB 1242	PCB 1248	PCB 1254	PCB 1260	1,1,1-Trichloroethane	1,1,1-Trichloroethylene
22,591	R150T-7A-27093	----	----	----	----	----	ND-10	ND-10
22,592	R150T-7B-27093	----	----	----	----	----	ND-10	ND-10
22,593	R150T-7C-27093	----	----	----	----	----	ND-10	ND-10
22,594	R150T-6A-27093	----	----	----	----	----	ND-10	ND-10
22,595	R150T-6B-27093	----	----	----	----	----	ND-10	ND-10
22,596	R150T-6C-27093	----	----	----	----	----	ND-10	ND-10
22,597	R150T-5C-27093	----	----	----	----	----	ND-10	ND-10

ND-non-detectable. Detection limits are shown next to "ND" notations.

BROOKSIDE FARMS LABORATORY ASS'N
ENVIRONMENTAL & INDUSTRIAL DIVISION
NEW KNOXVILLE, OHIO 45871
Tel: (419) 753-2446
WATER/WASTEWATER ANALYSIS

CHEMICAL WASTE MGT
8732 DARKWOOD DR
INDIANAPOLIS, IN
SUBMITTED BY: MENKE CONSULTING INC.

FILE NO. 60022
DATE RECV'D 11/03/83
DATE REPT'D 11/23/83

Lab No.	I-003
Description	R-150 WTR
	Milligrams Per Liter (ppm)
TOTAL ORGANIC SOLVENTS	59.000
	Micrograms Per Liter (ppb)
PCB	L.T 0.400

* L.T indicates less than value indicated

PKC

Attachment (3)

RESULTS FOR WATER SAMPLES (GRAB) TAKEN FROM BORINGS AT R-150 TANK

6929E/65C

Results: mg/l

Parameter Analyzed For	WES Boring WT-1 WT-1 Water Sample	WES Boring WT-2 WT-2 Water Sample 0' - 14'	WES Boring WT-2 WT-2 Water Sample 14'	WES Boring WT-3 WT-3 Water Sample	WT-4 Water Sample
Lead(1)	0.02	0.02	9.0	0.10	0.01
Chromium(1)	0.029	0.005	4.0	0.18	0.005
Copper(1)	0.008	0.009	5.5	0.11	ND (0.005)
Nickel(1)	0.04	0.05	(2)	0.31	0.04
Arsenic(1)	0.003	0.002	(2)	0.012	0.002
Cadmium(1)	0.004	ND (0.003)	0.065	ND (0.003)	ND (0.003)
Mercury(1)	0.0003	0.007	<0.1	0.0004	0.0002
Zinc(1)	0.084	0.13	20	0.53	0.096
Barium(1)	0.10	0.11	(2)	0.56	0.10
Total PCB	ND (.0002)	ND (0.00020)	0.00026	ND (.0002)	ND 0.0002
PCB 1242	ND (.0002)	ND (0.00020)	0.00026	ND (.0002)	ND 0.0002
PCB 1248	ND (.0002)	ND (0.00020)	(3)	ND (.0002)	ND 0.0002

NOTE: Samples were taken July 20-21, 1983.

Attachment (4)

RESULTS FOR WATER SAMPLES (GRAB) TAKEN FROM BORINGS AT R-150 TANK (continued)

6929E/65C

Results: mg/l

Parameter Analyzed For	WES Boring WT-1 WT-1 Water Sample	WES Boring WT-2 WT-2 Water Sample 0' - 14'	WES Boring WT-2 WT-2 Water Sample 14'	WES Boring WT-3 WT-3 Water Sample	WT-4 Water Sample
PCB 1254	ND (.0002)	ND (0.00020)	0.00026	ND (.0002)	ND 0.0002
PCB 1260	ND (.0002)	ND (0.00020)	0.00026	ND (.0002)	ND 0.0002
Trichloroethylene	.015	(2)	0.0028[4]	.14	0.290
1,1,1 Trichloroethane	1.2	(2)	ND (0.00050)(4)	ND (.001)	ND (0.001)
Methylene Chloride	ND (.010)	(2)	(2)	ND (.010)	ND (0.010)
Iron(1)	(2)	(2)	4200	(2)	(2)
Silver	(2)	(2)	0.015	(2)	(2)

NOTES: (1) Total
(2) Not analyzed for
(3) Presence of PCB 1242 or 1248 precludes the determination of the detection limit of the other aroclor.
(4) Aqueous phase analyzed; results may be unreliable due to improperly used containers.
(5) Samples were taken July 20-21, 1983.

ANALYSIS RESULTS FOR SOIL SAMPLES FROM BORINGS AT R-150 TANK

6929E/65C

Results: mg/kg

Parameter Analyzed For	WES Boring WT-1		WES Boring WT-2		WES Boring WT-3		WT-4		Comments
	WT-1A 0'-5'	WT-1B 5'-8.1'	WT-2A 0'-5'	WT-2B 5'-8.6'	WT-3A 0'-5'	WT-3B 5'-10.6'	WT-4A 0'-5'	WT-4B 5'-10.6'	
Total PCB	0.048	ND(4) (0.20)	ND (0.020)	ND (0.020)	(5)	(5)	(5)	(5)	
PCB-1242	0.048	ND(4) (0.20)	ND (0.020)	ND (0.020)	(5)	(5)	(5)	(5)	
PCB-1248	--(1)	ND(4) (0.20)	ND (0.020)	ND (0.020)	(5)	(5)	(5)	(5)	
PCB-1254	ND (0.20)	ND(4) (0.20)	ND (0.020)	ND (0.020)	(5)	(5)	(5)	(5)	
PCB-1260	ND (0.20)	ND(4) (0.20)	ND (0.020)	ND (0.020)	(5)	(5)	(5)	(5)	
Trichloroethylene	ND(2) (0.01)	ND(2) (0.01)	ND(2) (0.01)	ND(2) (0.01)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	
1,1,1 Trichloroethane	0.016(2)	ND(2) (0.01)	ND(2) (0.01)	ND(2) (0.01)	ND (0.0050)	ND (0.0050)	ND (0.0050)	ND (0.0050)	
Lead(3)	12	6	5	6	24	12	16	11	
Chromium(3)	27	30	23	25	27	32	30	39	
Copper(3)	17	13	12	11	15	12	15	12	
Iron(3)	2300	30000	18000	23000	(5)	(5)	(5)	(5)	

NOTE: Samples were taken July 20-21, 1983.

Attachment (5)

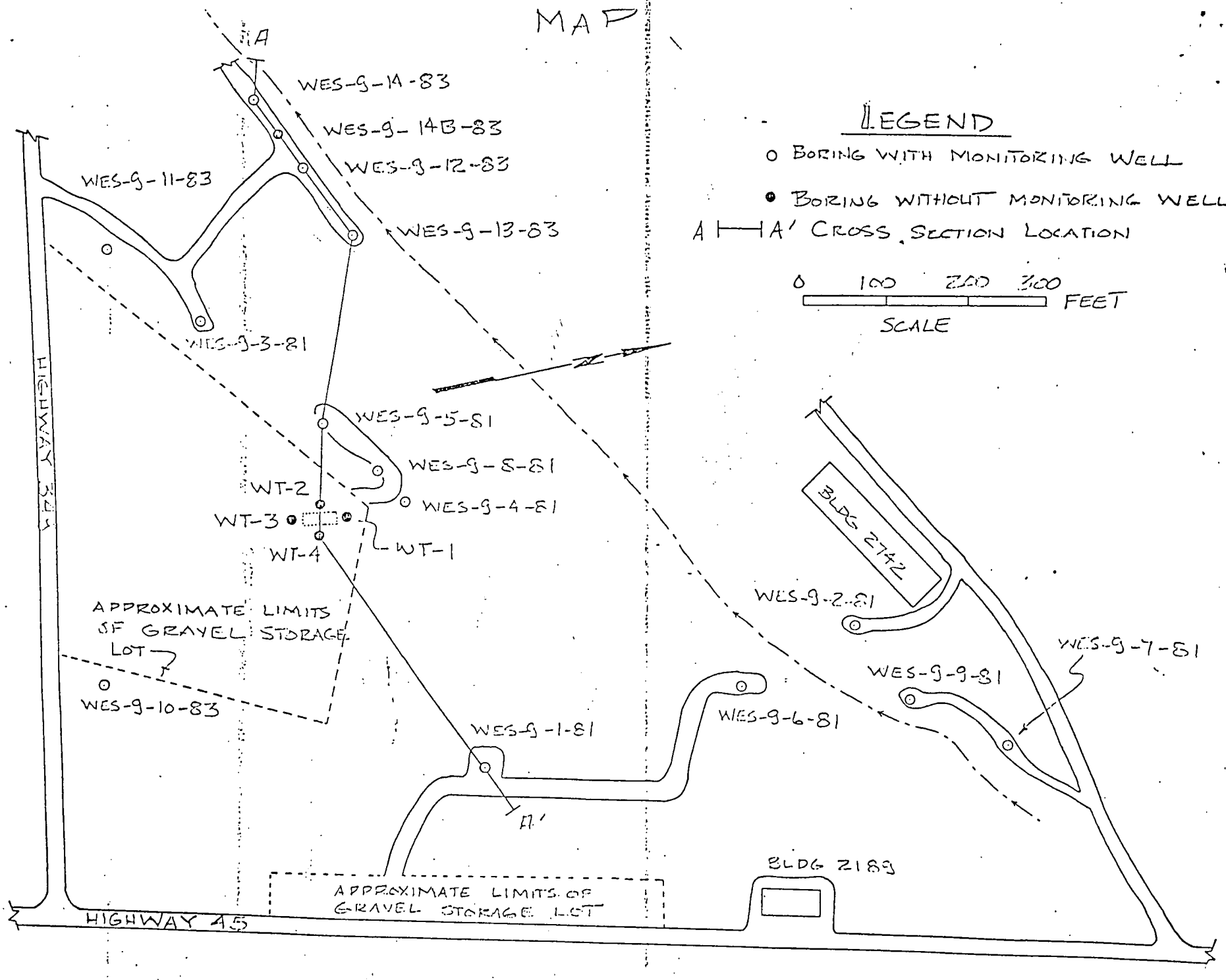
ANALYSIS RESULTS FOR SOIL SAMPLES FROM BORINGS AT R-150 TANK (continued) 6929E/65C

Results: mg/kg

Parameter Analyzed For	WES Boring WT-1		WES Boring WT-2		WES Boring WT-3		WT-4		Comments
	WT-1A 0'-5'	WT-1B 5'-8.1'	WT-2A 0'-5'	WT-2B 5'-8.6'	WT-3A 0'-5'	WT-3B 5'-10.6'	WT-4A 0'-5'	WT-4B 5'-10.6'	
Silver(3)	<0.8	ND (0.8)	<0.8	ND (0.8)	(5)	(5)	(5)	(5)	
Cadmium(3)	<0.8	<0.8	<0.8	<0.8	ND (0.08)	ND (0.08)	ND (0.8)	ND (0.8)	
Mercury(3)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.01)	ND (0.01)	0.2	0.1	
Zinc(3)	64	68	36	44	96	90	0.87	47	
Methylene Chloride	(5)	(5)	(5)	(5)	ND (0.12)	ND (0.12)	0.17	ND (0.12)	
Arsenic(3)	(5)	(5)	(5)	(5)	7.1	3.8	7.5	8.6	
Barium(3)	(5)	(5)	(5)	(5)	44	32	42	32	
Nickel(3)	(5)	(5)	(5)	(5)	25	27	18	19	

NOTES:
(1) Presence of PCB 1242 or 1248 precludes the determination of the detection limit of the other aroclor. Higher detection limit due to matrix interference.
(2) Results are reported on a wet-weight basis.
(3) Totals.
(4) Higher detection limit due to matrix interference.
(5) Not analyzed for.
(6) Samples were taken July 20-21, 1983.

PEST CONTROL AREA - BORING LOCATION MAP



Attachment (6)

TOX RESULTS IN mg/l

DATE	9-1 (1)	9-3	9-4	9-5	LAB
14 Dec 81	.012	.343	.027	.096	Century
	.025	.255	.023	.037	Century
	.043	.225	.021	.022	Century
	.012	.228	.040	.033	Century
06 Apr 82	ND	.061	.025	.150	Century
	.130	.036	.026	.140	Century
	.150	.063	.030	.130	Century
	.150	.060	.026	.140	Century
27 Jul 82	ND	.650	.027	.050	Century
	ND	.480	.027	.038	Century
	ND	.510	.070	.055	Century
	ND	.520	.031	.038	Century
14 Sep 82	.110	.710	.060	.160	Century
	.130	.700	.079	.160	Century
	.100	.740	.100	.120	Century
	.088	.700	.075	.120	Century
28 Feb 83	.012	.500	.046	.037	Century
	ND	.540	.044	.033	Century
	ND	.500	.042	.035	Century
	.011	.500	.043	.031	Century
31 Jul 83				.120	Century
				.120	Century
				.120	Century
				.130	Century
03 Aug 83	ND	.500	.022		Century
	ND	.470	.024		Century
	ND	.470	.025		Century
	ND	.470	.023		Century

On September 27, 1983, excavated and removed underground tank at R-150.

Had removed all contaminated soil from hole and replaced with non-contaminated fill material by January 27, 1984.

TOX RESULTS IN mg/l

DATE	9-1 (1)	9-3	9-4	9-5	LAB
07 Feb 84	ND (0.002)	ND (0.001)	0.007	ND (0.001)	ERG (2)
08 Jun 84	ND (0.01)	0.27	0.04	0.02	ERG (2)
16 Jan 85	<.005	.553	0.031	0.027	Aqua Tech

NOTES:

(1) Background Well

(2) The analytical contractor/lab ran separate analysis for Total Organic Bromide, Total Organic Chloride and Total Organic Iodide. Since contamination in tank was Trichloroethylene and 1,1,1, Trichloroethane, we are only showing results for Total Organic Chloride analysis.

MISCELLANEOUS

SPECIAL SAMPLING - ANALYTICAL RESULTS

Analytical Lab ERG

LITTLE SULPHUR CREEK
(Sampling Location)

Below Ash Pile at ABG

SAMPLING DATE	CLIENT I.D.	mg/l MERCURY	mg/l LEAD	mg/l CADMIUM	mg/l CHROMIUM	mg/l COPPER	mg/l CHLORIDE	mg/l RDX	mg/l HMX	mg/l TNT	mg/l CYANIDE	OIL& GREASE
10-27-82	LSC-127102	0.0003	<0.01	<0.003	Hexavalent <0.01	<0.005	4	<0.010	<0.20	0.38	<0.01	<2
11-17-82	LSC-117112	<0.0002	0.01	<0.003	Total <0.005	<0.005	4	<0.05	<0.05	9.2	<0.01	<2
12-08-82	LSC-108122	0.0002	<0.01	<0.003	<0.005	<0.005	3	<0.05	<0.05	18	<0.01	<2
01-20-83	LSC-120013	NO SAMPLE PULLED - CREEK DRY AT THIS POINT.										
02-24-83	LSC-124013	NO SAMPLE PULLED - CREEK DRY AT THIS POINT.										
03-17-83	LSC-117033	0.0003	0.02	ND 0.003	0.008	0.005	4	.022	<.05	<.01	ND 0.01	<2
04-21-83	LSC-121043	0.0004	0.01	ND 0.003	ND 0.005	ND 0.005	4	.013	<.05	.024	ND 0.01	ND 2
05-19-83	LSC-119053	<.0002	ND .01	ND .003	0.007	0.014	2	.057	<.05	<.01	ND .01	Not Sent
10-18-83	LSC-118103	<0.0003	0.032	0.005	0.020	0.034	6	1.3	<.05	.71	0.03	<1
11-16-83	LSC-16113	<0.0004	<0.010	<0.005	<0.010	0.020	3	.057	<.01	.022	<0.010	1
12-14-83	LSC-14123	<0.0003	<0.010	<0.005	0.011	<0.004	3	.014	<.01	<.01	<0.01	<1
01-25-84	LSC-125014	<0.0003	<0.01	<0.004	<0.01	<0.004	48	0.03	ND 0.01	ND 0.01	0.02	2
03-28-84	LSC-128034	<0.0003	0.036	0.028	0.016	0.022	5	0.094	ND 0.01	ND 0.06	<0.01	<1
04-25-84	LSC-125044	<0.0003	<0.01	<0.005	<0.01	<0.004	3	ND 0.01	ND 0.01	ND 0.01	<0.01	1
05-22-84	LSC-122054	<0.0003	<0.01	<0.005	<0.01	<0.004	4	ND 0.01	ND 0.01	ND 0.10	<0.01	<1

REPRODUCED AT GOVERNMENT EXPENSE

SPECIAL SAMPLING - ANALYTICAL RESULTS

Pond at 106
(SAMPLING LOCATION)

SAMPLE ID	PARAMETER	ANALYSIS	DATE
PN 106-23033	Cyanide	ND .01	03-23-83
PS 106-23033	Cyanide	ND .01	03-23-83
PE 106-23033	Cyanide	ND .01	03-23-83
PW 106-23033	Cyanide	ND .01	03-23-83

ENVIRONMENTAL INSTRUMENT SYSTEMS, INC.
1701 N. Ironwood Dr., South Bend, IN 46635
(219) 277-5715

ANALYTICAL REPORT SHEET

CLIENT:
Naval Weapons Support Center
Crane, Indiana

SAMPLE IDENTIFICATION:
Ash Pile ABG-1
EP Hazardous Waste Leachate/Toxicity

ANALYSIS NO: 7587 thru 7591

DATE SAMPLED: 9/18/81

DATE RECEIVED: 9/25/81

DATE FORWARDED: 11/9/81

Parameter	Sample 1 0'- 5'	Sample 2 5' - 10'	Sample 3 10'- 15'	Sample 4 15'- 21'	Sample 5 21'- 24'
Arsenic	<0.010	<0.010	<0.010	<0.010	<0.010
Barium	33.7	16.4	6.1	1.5	0.9
Cadmium	0.32	0.76	0.39	0.22	<0.05
Chromium	0.06	0.08	<0.05	<0.05	<0.05
Lead	9.5	300.	6.4	31.	0.26
Mercury	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	<0.005	<0.005	<0.005	<0.005	<0.005
Silver	0.02	0.02	0.01	<0.01	<0.01
RDX	26.5	6.2	13.3	0.9	3.9
TNT	21.9	1.8	1.0	0.2	0.9
HMX	0.8	0.7	1.1	0.8	0.8

All five samples were extracted and analyzed according to the Resource Conservation and Recovery Act (RCRA) EP Toxicity Test Procedure as enacted in December 1980.

LABORATORY DIRECTOR

Two things should be noted:

1st: Sample #1 used all of the 0.5 N acetic acid that was allowable and had a final pH of 5.6.

2nd: The remaining four sample all had a pH above 5.2 at the end of the 24 hour extraction and required an addition 4 hours of extraction with the pH being adjusted every hour.

TEST DATA

Sample ID	Metals							
	Ag	Cr	As	Cd	Pb	Se	Ba	Hg
1-1A	.0016	.0163	.054	<.005	.0176	.0206	<.10	4.62×10^{-5}
1-2A	<.001	.0392	.048	<.005	<.001	.0074	<.10	1.62×10^{-5}
2-1A	<.001	.0230	.069	<.005	<.001	.0072	<.10	2.14×10^{-5}
2-2A	<.001	.0131	.055	<.005	<.001	.0122	<.10	1.11×10^{-5}
3-1A	<.001	.0234	<.010	<.005	<.001	.0105	<.10	4.25×10^{-5}
3-2A	<.001	.0355	<.010	<.005	<.001	<.002	<.10	7.97×10^{-5}
4-1A	<.001	.0326	.029	<.005	<.001	.080	<.10	3.65×10^{-5}
4-2A	<.001	.0318	<.010	<.005	<.001	<.002	<.10	1.56×10^{-5}
5-1A	<.001	.0274	.032	<.005	<.001	.0187	<.10	1.67×10^{-5}
5-2A	<.001	.0340	.018	<.005	.0158	<.002	<.10	1.29×10^{-5}
2-6-1B	<.001	.0270	<.010	<.005	.004	<.002	<.10	19.5×10^{-5}
2-6-2B	<.001	.0200	<.010	<.005	.008	<.002	<.10	14.0×10^{-5}
2-7-18	<.001	.0130	<.010	<.005	.003	<.002	<.10	36.7×10^{-5}
2-8-1B	<.001	.0210	<.010	<.005	.016	<.002	<.10	43.1×10^{-5}
2-8-2B	<.001	.0320	<.010	<.005	.005	<.002	<.10	24.9×10^{-5}
2-YD-1A	.001	1.08	<.010	<.005	5.49	.010	<.10	28.1×10^{-5}

1. Test data based on 1 gram soil sample digested and diluted to 100 ml for analysis.

2. All values are reported as percent metal content in the soil submitted for analysis.

DEPARTMENT OF THE NAVY
NAVAL WEAPONS SUPPORT CENTER
CRANE, INDIANA 47522

IN REPLY REFER TO:
3025-ERP:osb
8000/5
19 Feb 1985

MEMORANDUM

From: 3025
To: 0924 (J. Belcher)

Subj: Dye Burial Ground Core Samples

Ref: (a) 3025-ERK:se, 8000/2 of 26 Mar 1982

Encl: (1) Test Data

1. Per your request for clarification of reference (a), a complete review of existing data was initiated. In review, 16 core samples from well drilling sites in the dye burial ground were received in 1981-82 for dye analysis and examination for metals.

2. Analyses for dyes were requested for a possible 15 individual dyes which were known to have been buried in the late 1960's in a possible 59 combinations. Exhaustive extractions of samples were necessary to confirm the presence/absence of any of the 15 dyes. The presence of dye was confirmed in 2 of the 16 samples. The yellow material in Sample 2-YD-1A was determined to be lead chromate (Pigment Chrome Yellow). The red dye detected in Sample 2-6-1B could not be identified as any of the 15 dyes known to have been buried at the dye burial ground. No further analysis was requested.

3. A cursory examination for eight metals was conducted utilizing a then current standard acid digestion procedure on a one gram sample and an atomic absorption spectrophotometer or mercury analyzer, as applicable. The original data was reported in units of parts per million (ppm), the correct unit of measure for the aqueous solution in the final analysis. Enclosure (1) contains the test data interpreted as the percent metal contained in the actual soil sample.

4. Current analysis procedures, as stipulated by the U.S. Environmental Protection Agency in SW-846, "Test Methods for Evaluating Solid Waste -- 2nd Edition, Revised 1984", requires a 100 gram sample and certain specialized equipment. This equipment has been procured and is currently in use.

5. Any additional information may be obtained by contacting the Explosive Sciences Branch, 3025 (B. Patton), at extension 1252.

R. E. Klausmeier

R. E. KLAUSMEIER

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-85 - COMMANDER 10-03-83

SPECIAL SAMPLING - ANALYTICAL RESULTS
BUILDING 146 DRAINAGEWAY

CLIENT I.D.: B146LD-11083
ERG SAMPLE NO: 08/094113
MATRIX: SOIL
DATE COLLECTED: 08-11-83

PARAMETER	RESULTS	UNITS
E.P. TOXICITY (LEACH) OF SOIL (ASTM)	8/25/83	FIKgTER
RDX (BY HPLC)	ND (0.50)	mg/Kg
HMX (BY) HPLC	ND (0.50)	mg/Kg
TNT (TRINITROTOLUENE)	ND (0.50)	mg/Kg

CLIENT I.D.: B146LD-11083
ERG SAMPLE NO: 08/094114
MATRIX: SOIL
DATE COLLECTED: 08-11-83

PARAMETER	RESULTS	UNITS
E.P. TOXICITY (LEACH) OF SOIL (ASTM)	8/25/83	FIKgTER
RDX (BY HPLC)	ND (0.50)	mg/Kg
HMX (BY) HPLC	ND (0.50)	mg/Kg
TNT (TRINITROTOLUENE)	ND (0.50)	mg/Kg

CLIENT I.D.: LEACHATE OF 08/094113
ERG SAMPLE NO: 08/094267
MATRIX: EP-TOX LEACHATE
DATE COLLECTED: 08-11-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

CONTINUED

ANALYTICAL REPORT

ENVIRONMENTAL RESEARCH GROUP, INC.

ERG PROJECT NO. 69-65 - COMMANDER 10-03-83

CLIENT I.D.: LEACHATE OF 08/094114
ERG SAMPLE NO. 08/094268
MATRIX: EP-TOX LEACHATE
DATE COLLECTED: 08-11-83

PARAMETER	RESULTS	UNITS
RDX (BY HPLC)	ND (10)	ug/L
HMX (BY HPLC)	ND (10)	ug/L
TNT (TRINITROTOLUENE)	ND (10)	ug/L

FR - SEE FIELD REPORT FOR RESULT
NA - NOT APPLICABLE TO TEST REQUESTED
ND - NONDETECTED, DETECTION LIMIT IN ()
SD - SAMPLE DAMAGED
SR - SEE ATTACHED REPORT FOR RESULT
< - POSITIVE RESULT BUT AT UNQUANTIFIABLE CONCENTRATION BELOW INDICATED LEVEL

THANK YOU FOR YOUR BUSINESS !

SOIL SAMPLES FROM AMMUNITION BURNING GROUND

The following analytical results for explosives are from soil samples collected from soil beneath the existing surface impoundmnets. The concentrations of TNT, RDX, and HMX in the soil are listed in the following table:

WEIGHT PERCENT EXPLOSIVES IN DRY SOIL

DEPTH	TNT	RDX	HMX
Surface	0.0016±0.0005	0.062±0.007	0.041±0.003
1.5 feet	0.00021±0.00011	0.00077±0.00010	0.0018±0.0002
3.0 feet	0.00035±0.00003	0.00019±0.00002	0.0010±0.0002
4.5 feet	0.00070±0.00015	0.00082±0.00002	0.0014±0.0002
6.0 feet	0.00042±0.00012	0.00045±0.00011	0.0012±0.0002

There was no tetryl detected in the soil samples.

The samples show the soil to be contaminated with explosives to a depth of six (6) feet. However, the only significantly contaminated sample was taken from the surface.

These surface impoundments were included in the Part B application we submitted in October of 1984.