B.4

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 833D COMBAT SUPPORT GROUP (TAC)

HOLLOMAN AIR FORCE BASE NM 88330-5000

MAY 1990
RECEIVED
HAZARDOUS WASTE
PROGRAM

REPLY TO ATTN OF: 833 CSG/DEV

25 MAY 1990

SUBJECT: Groundwater Reports

TO: Mr. Boyd Hamilton
Hazardous Waste Bureau
Environmental Improvement Division
New Mexico Health and Environment Department
1190 St Francis Dr
Santa Fe, NM 87503

ENTERED

1. Provided under separate cover are the following documents:

a. Second Monthly Ground Water Sampling Report September 25 through 28, 1989 Holloman Air Force Base, New Mexico

b. Third Monthly Ground Water Sampling Report November 5 through 8, 1989 Holloman Air Force Base, New Mexico

c. Fourth Monthly Ground Water Sampling Report December 10 through 14, 1989 Holloman Air Force Base, New Mexico

d. First Semi-Annual Ground Water Sampling Report January 15 through 17, 1990 Holloman Air Force Base, New Mexico

e. Summary Report for Additional Samples Collected during the First Quarter of Groundwater Sampling at Holloman Air Force Base, NM.

2. The background contamination indicator parameter summary statistics for upgradient wells and comparisons with data from the first semi-annual groundwater sampling episode has not yet been finalized and provided to the base. At such time as the report is provided to Holloman AFB, it will be forwarded to the USEPA Region VI and to the NMEID.

3. If you have any questions or comments on the submitted reports, please contact Sharon Moore at 479-3931.

Howard E. Moffitt

HOWARD E. MOFFITT
Deputy Base Civil Engineer

Under Separate Cover
2nd, 3rd, 4th, Semi-Annual
Groundwater Reports,
and Additional Samples
Analytical Report

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Langley AFB, VA 23665

US Army Corps of Engineers
Omaha District
Attn: Brian Stewart
215 N. 17th Street
Omaha, NE 68102-4978

These 4 volumes are in my gray shelf-[illegible] w/ yellow-[illegible] tops on [illegible]

SECOND MONTHLY
GROUND WATER SAMPLING REPORT
SEPTEMBER 25 THROUGH 28, 1989
HOLLOMAN AIR FORCE BASE, NEW MEXICO

Prepared for:

HQ TAC/DEEV
Langley AFB, Virginia 23665-5542

Under Contract with:

U.S. Army Corps of Engineers, Omaha District
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May 1990

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1.0 INTRODUCTION

International Technology Corporation (IT) is the prime Architect-Engineer (A-E) contracted by the U.S. Army Corps of Engineers, Omaha District, to implement a Resource Conservation and Recovery Act (RCRA) Ground Water Monitoring Program (described in Code of Federal Regulations Title 40, Part 265 [40 CFR 265]) at the sewage lagoons and Lakes Holloman and Stinky, Holloman Air Force Base, New Mexico. The ground water monitoring program is being performed under Contract No. DACW45-88-D-0008 and is in accordance with the December 22, 1989 signed Federal Facility Compliance Agreement (FFCA) between Holloman Air Force Base, the New Mexico Environmental Improvement Division, and the U.S. Environmental Protection Agency, Region VI. As part of the ground water monitoring program, monitoring wells are being sampled at approximately monthly intervals for a total of four sampling rounds. The first round of sampling was performed in August, 1989, by Radian Corporation, Austin, Texas. This report describes the results of the second round of ground water sampling activities conducted at the Holloman Air Force Base sewage treatment lagoons during the period September 25 through 28, 1989. This schedule is an acceleration of the RCRA ground water monitoring program described in 40 CFR 265, Subpart F, to establish background concentrations for ground water parameters. RCRA ground water monitoring, as modified, has been followed to meet the requirements of the FFCA. Ground water sampling was conducted in accordance with the Architect-Engineer Safety, Health and Emergency Response Plan (A-E SHERP) (IT, 1989a) and the Architect-Engineer Quality Control Plan/Sampling Plan for Groundwater Study and Monitoring Program, Holloman Air Force Base, New Mexico (A-E QCP/SP) (IT, 1989b). The A-E QCP/SP is based on the Hydrogeologic Investigation Report and Groundwater Monitoring Plan for the Sewage Treatment Lagoons, Holloman Air Force Base, NM 88330 (Radian, 1989). The ground water monitoring plan was approved by the EPA in 1989.

In accordance with the ground water monitoring requirements of 40 CFR 265.92(b)(1), samples were collected and analyzed for concentrations of those parameters characterizing the suitability of the ground water as a drinking water supply (40 CFR 265, Appendix III). Concentrations of constituents characterizing ground water quality [40 CFR 265.92(b)(2)] and

ground water contamination indicator parameters [40 CFR 265.92(b)(3)] were also determined in the samples. Descriptions of field methods employed and a discussion of analytical and quality control results are provided below. Job logs documenting daily field activities are presented in Appendix A.

2.0 FIELD METHODS AND MEASUREMENTS

Field measurements made prior to ground water sample collection determined the presence or absence of organic vapors and nonaqueous phase liquids in the wells, well water-levels, and total well depths. This information led to calculation of well-bore water volumes, the volumes of water to be purged prior to well sampling, and the frequency of field pH and specific conductance measurements taken during well purging. Data forms documenting field measurement activities are provided in Appendix B.

2.1 ORGANIC VAPOR DETECTION

The presence of organic vapors in a well-bore atmosphere can be an indicator of nonaqueous phase liquids possibly being present in the well. Prior to measuring water levels in each well, the well head atmosphere was analyzed for organic vapors using a calibrated Hnu PI-101 field photoionization detector with using a 10.2-eV lamp. Calibration of the Hnu instrument was accomplished using a standard reference gas (100 ppm isobutylene/air) prior to analyzing any well head atmospheres. Additionally, a background organic vapor concentration value was measured at each well location by sampling the atmosphere at large. Then, immediately after opening the monitor well cap, the detector was inserted into the well casing and the organic vapor content was measured. Well head organic vapor concentrations ranged from 0.1 to 1.5 parts per million (ppm) in the Holloman monitoring wells. Except for well MW-1, well head organic vapor measurement values were less than on-site background values. The generally low concentrations of measurable organic vapors in the well head atmospheres and the fact that most of the well head organic vapor values were less than background indicated a probable absence of nonaqueous phase liquids in the wells.

2.2 WATER LEVEL, TOTAL DEPTH, AND IMMISCIBLE ORGANIC LAYER DETERMINATIONS

Water level, total well depth, and the location or absence of immiscible organic layers were determined by measurement from surveyed points indicated on the tops of the well casings. An ORS interface probe, calibrated using a steel surveyor's tape, was used to measure the distances between top of casing and both water surface and well bottom. The ORS probe creates a steady tone when water is encountered and a broken tone when encountering immiscible layers either less dense or denser than water. Immiscible layers were not detected in any of the monitoring wells. Results of the water level and total well depth measurements, as well as calculated well volumes and sampling purge volumes, are listed in Table 1.

2.3 WELL EVACUATION

Well evacuation and ground water sampling were performed following procedures in the A-E QCP/SP. New protective clothing was donned by site personnel and nondedicated sampling equipment was decontaminated using nonphosphate detergent wash, tap water rinse, deionized water rinse, methanol and hexane rinses prior to actual well evacuations. Dedicated 1-1/2 inch diameter teflon bailers with stainless steel leaders attached to polypropylene ropes were used to purge and sample the wells. Approximately five well volumes of water were purged from the wells with five to seven measurements of pH, specific conductance, and temperature being recorded at intervals during bailing. Because of an instrument malfunction, turbidity measurements were not taken during well evacuations. Water from well S-2 appeared very turbid, visually, for the first couple of bails; but the water cleared as purging progressed. Slight turbidity was noted in at least the initial bails from most of the wells. Field notes describing the well evacuations are contained in Appendix B. Following the purge of approximately five well volumes of water from each monitoring well, collection of ground water samples began.

2.4 GROUND WATER SAMPLING

The monitor wells were sampled upon completion of the purging criteria. The wells sampled include the upgradient wells MW-1 and S-2, and downgradient wells MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and S-4. Quality assurance samples were also collected during this September, 1989, sampling episode. These samples included a blind field duplicate

sample collected at well MW-1 and identified as well MW-12, two duplicate quality assurance sample collected at wells MW-1 and MW-8 which were forwarded to the U.S. Army Corps of Engineers, Missouri River Division Laboratory, Omaha, Nebraska, for independent analysis, and a trip blank sample for purgeable organic halides (POX) identified as well MW-11. Concentrations of analytes which were sampled in each of the wells are listed in the tables of analytical results (Tables 2, 3, and 4).

Field Measurements

The parameters specific conductance, pH, and temperature were measured in the field during well purging, and before and after each sampling sequence. Specific conductance was determined using a Cole-Palmer model 1481-60 conductance meter in automatic temperature compensation mode. This meter is capable of determining the specific conductance of ground water over a wide range of values. This proved necessary to measure specific conductance of ground water from the Holloman sewage lagoon monitoring wells. All specific conductance measurements were made using the meter's 0 to 200,000 micromohs per centimeter (μ mhos/cm) scale. The meter was calibrated daily by standard solution at the scale midpoint. pH was determined using an Orion SA-250 meter, calibrated daily. Temperature was determined using a mercury in glass thermometer. These field measurements were recorded on the field sampling data sheets located in Appendix B. Specific conductance and pH measurements are also summarized in Table 4.

Sample Collection

Ground water samples were obtained from each well by carefully pouring from the dedicated teflon bailers. All samples were poured directly into prepared sampling containers. There were no field filtrations of samples. Clean surgical gloves were donned immediately prior to sample collection, and again immediately prior to collection of bacteriological samples. Ground water samples were collected for analysis in the following order:

Purgeable organic halides (POX)
Total organic carbon (TOC)
Pesticides
Herbicides
Metals

Phenolics
General chemistry (anions)
Nitrate and nitrite
Radiochemistry
Coliform bacteria.

Sample Containers and Preservatives

Sample collection containers were supplied by the International Technology Analytical Services (ITAS) laboratories in Austin, Texas, and Middlebrook, Tennessee. Appropriate sample preservatives were added to the containers at the laboratory prior to shipment.

2.5 SAMPLE HANDLING AND SHIPMENT

All samples were isolated in sealable plastic bags and placed on ice in a shipping cooler immediately after collection. Samples were shipped by overnight carrier in a sealed shipping container with complete chain-of-custody documentation to the ITAS laboratories in Middlebrook, Tennessee, and Austin, Texas, and to the U.S. Army Corps of Engineers, Missouri River Division Laboratory in Omaha, Nebraska. Bacteriological samples were hand-carried with chain-of-custody documentation to the Soil, Water, and Plant Testing Laboratory, New Mexico State University, Las Cruces, New Mexico, for analysis. Chain-of-custody documentation for all samples are located in Appendix C.

3.0 ANALYTICAL RESULTS

Samples from each of the wells were analyzed for the parameters listed in the U.S. Environmental Protection Agency (EPA) Interim Primary Drinking Water Standards, ground water quality indicator parameters, and ground water contamination indicator parameters. Laboratory analytical reports containing analytical results, quality control results, and method detection limits are presented in Appendix D. Summaries of analytical results are presented in Tables 2, 3, and 4.

3.1 METHOD DETECTION LIMITS

Method detection limits (MDL) actually achieved by the analytical laboratories during analyses of the September, 1989, samples are listed in Table 5. All primary drinking water parameters

were analyzed at MDLs equal to or less than the associated maximum contaminant levels with the exceptions of selenium, radiochemistry, and coliform bacteria.

Selenium, as well as arsenic and lead, were analyzed using the A-E QCP/SP required atomic absorption graphite furnace instrumentation. The ITAS Middlebrook laboratory reported matrix interference problems with selenium, arsenic, and lead, utilizing this instrumentation because of the high dissolved solids content of the samples. Alternative EPA-approved analytical procedures which can yield MDLs less than the associated maximum contaminant levels are being investigated. These methods may be implemented during analysis of samples collected during the next sampling episode.

Samples for the radiochemistry analyses, gross alpha and gross beta activities, could not be analyzed at MDLs less than the associated maximum contaminant levels because of the high dissolved solids concentrations in the samples. The A-E QCP/SP requires laboratory filtration through 0.45-micron filters and preservation with nitric acid (HNO_3) to a pH less than two for radiochemistry samples. The ITAS laboratory in Oak Ridge, Tennessee, performed the radiological analyses for the ITAS Middlebrook laboratory and initially analyzed samples from wells MW-1, MW-12, S-2, MW-4, MW-5, MW-6, MW-8, and S-4 on a total, unfiltered basis. Those samples were reanalyzed by ITAS Oak Ridge after filtration and acid preservation upon the request of project personnel. Final radiological analyses, while delayed, were performed utilizing correct procedures and the resulting data are acceptable within the limits of the analytical method given the high total dissolved solids content of the samples.

Samples for coliform bacteria could not be analyzed at MDLs of 1 colony per 100 milliliters (ml) primary drinking water standard due to excessive numbers of noncoliform bacteria present in the samples. All samples were analyzed by the New Mexico State University laboratory in triplicate, at as-received concentration, at a 10-times dilution, and at a 100-times dilution. Bacterial counting was performed on the least possible dilution. Analytical results reported in Table 2 reflect the minimum sample dilution at which laboratory personnel could enumerate bacterial colonies. Table values reported as less than 10 colonies per 100 ml, for example,

indicate that the laboratory did not identify any coliform colonies in the sample at a 10-times sample dilution.

Excessive growth of noncoliform bacteria in the incubated samples and sample dilutions has made accurate enumeration of coliforms difficult. Because method detection limits could not be achieved, and estimates for method precision and accuracy are unavailable, the usefulness of these data for assessing the impact of the sewage lagoons on local ground water conditions is doubtful. Coliform bacteria concentration is an indicator of drinking water quality, not potential RCRA hazardous waste components in ground water. The effect of the unlined sewage treatment lagoons at Holloman Air Force Base on local coliform concentrations in ground water is predictable; however, increased coliform bacteria concentrations are unlikely to be reliable indicators of hazardous waste migration from the lagoons.

3.2 PRIMARY DRINKING WATER STANDARDS

Concentrations of analytes listed as EPA Interim Primary Drinking Water Standards and their associated maximum contaminant levels are located in Table 2. All parameter concentrations were reported either less than, or within the range of maximum contaminant levels, with the following exceptions:

- Fluoride concentrations in samples from wells MW-1, MW-2, MW-4, MW-6, MW-8, and S-4 were less than the 1.4 milligram per liter (mg/l) minimum concentration standard. Fluoride concentration in the sample from well S-2 (3.4 mg/l) exceeded the maximum contaminant level standard (2.4 mg/l) for drinking water.

- Lead concentrations in samples from wells MW-6 and S-4 [88.0 and 61.1 micrograms per liter (µ g/l), respectively] exceeded the maximum contaminant level of 50 µ g/l for drinking water.

- Nitrate concentration in the sample from well S-4 was reported at 26 mg/l, exceeding the maximum contaminant level of 10 mg/l.

- Silver concentration in the sample from well MW-2 was 182 µ g/l, exceeding the maximum contaminant level of 50 µ g/l.

- Coliform bacteria were reported at greater than or equal to 20 colonies per 100 ml of sample for sample from well MW-7. This bacterial count exceeds the maximum contaminant level of 1 colony per 100 ml established for drinking water. The laboratory performing the analyses indicated that the MW-7 well sample was counted at a 10-times dilution. Consequently, the laboratory actually counted two colonies in the diluted sample and reported that there may have been more colonies,

except that interference from noncoliform bacteria prevented making a more precise determination. Coliform bacterial in the sample from MW-8 was reported at 10 colonies per 100 ml, also exceeding the maximum contaminant level. Coliform bacteria in all other samples were reported as not detectable at MDLs exceeding the maximum contaminant level, as previously noted.

- Selenium concentrations were reported as not detectable in all well samples. However, MDLs for the selenium analyses exceeded the maximum contaminant level of 10 µ gl.

- Radium activities exceeding the 5 picoCuries per liter (pCi/l) maximum contaminant level were reported in samples from wells MW-5 [5.3 (0.9) pCi/l], MW-6 [10.1 (1.5) pCi/l], S-4 [6.2 (1.0) pCi/l]. Values in parentheses represent an error range of plus or minus two standard deviations. The reported radium activities are only slightly greater than the MDL of 5 pCi/l.

- Gross alpha activities exceeding the 15 pCi/l maximum contaminant level were reported in the dissolved sample fractions from wells MW-2 [35 (27) pCi/l] and MW-7 [106 (56) pCi/l]. Values in parentheses represent on error range of plus or minus two standard deviations.

3.3 GROUND WATER QUALITY PARAMETERS

Analytical results for parameters indicating ground water quality including chloride, sodium, sulfate, iron, manganese, and phenols are listed in Table 3. While samples from the Holloman Air Force Base monitoring wells are generally typified as high in dissolved solids content, there are wide variations in major analyte concentrations from well to well. The lowest chloride concentrations were reported in the 1,000- to 2,000-mg/l range (one to two grams per liter) in samples from wells S-2 (upgradient), MW-2, MW-5, and MW-7 (all downgradient). Samples from wells MW-3, MW-4, and MW-8 were reported having chloride concentrations between 3,000 and 5,000 mg/l. The greatest chloride concentrations were reported in samples from wells MW-1 (upgradient), MW-6 and S-4 (both downgradient), ranging from 14,000 to 44,000 mg/l. Sodium concentrations in the well samples followed the same general trend established by the chloride concentrations. Well samples exhibiting low chloride concentrations also exhibited low sodium concentrations. The corollary appears true for samples exhibiting high chloride concentrations. Sulfate concentrations ranged between 1,800 and 5,200 mg/l in the well samples. Concentration values for iron ranged from 243 to 924 µ g/l. Manganese concentrations were lowest in the two upgradient wells MW-1 and S-2, and the downgradient

well S-4, ranging from 10 to 144 μg/l. Manganese concentrations in the remaining downgradient wells ranged from 483 to 2,080 μg/l. Phenols were not detected in any of the samples at a MDL of 0.01 mg/l except for the sample from well MW-2, where phenols were reported near the detection limit at 0.01 mg/l.

3.4 CONTAMINATION INDICATOR PARAMETERS

Concentrations of the ground water contamination indicator parameters (pH, specific conductance, total organic carbon, and purgeable organic halides) for samples from the Holloman Air Force Base monitor wells are listed in Table 4. Four replicate measurements of each contamination indicator parameter are reported for the upgradient wells MW-1 and S-2. pH values measured in the field after sampling ranged from 6.57 to 7.24 pH units. Specific conductance, also measured in the field, ranged from 4,600 to 103,000 μ mhos/cm at 25°C. All specific conductance measurements were made using a conductivity meter set on a 0 to 200,000 μ mhos/cm scale. Total organic carbon analytical results were distributed between not detectable at a MDL of 1 mg/l and 13 mg/l across the Holloman well samples. Results for analyses of purgeable organic halides (POX) on the well samples are also reported in Table 4. Concentration values for POX ranged from not detectable at 0.005 mg/l as chloride to 4.4 mg/l as chloride.

Following the September, 1989, sampling of the Holloman monitoring wells, the laboratory performing the purgeable organic halide analyses reported insufficient sample volumes required to complete the analyses. This necessitated resampling the wells for POX. Resampling was conducted on October 4 and 5, 1989, as indicated in the confirmation notice shown in Appendix E. The wells were purged again, prior to resampling, according to normal sampling procedures. This off-schedule sampling event should have no effect on data quality.

Additionally, the laboratory performing the POX analyses did not use the analytical method (EPA 9021) specified in the A-E QCP/SP. Rather, the laboratory ran two total organic halide analyses per sample--one analysis on the sample as received and the other analysis after purging out the volatile compounds. The difference between the two analytical results was reported as purgeable organic halide concentration. Project staff were unaware of the

laboratory's inability to use the specified method and of their substitution of methods until after the fact. Measures are currently being undertaken to ensure that future purgeable organic halide analyses are performed by the correct method. The purgeable organic halide values listed in Table 4 should be viewed as suspect, and the comparability of these data with data collected in subsequent sampling and analysis events cannot be assured.

4.0 QUALITY CONTROL

Quality control (QC) samples were collected during the September, 1989, sampling effort for analysis in accordance with the procedures specified in the A-E QCP/SP. Environmental duplicate samples and purgeable organic halide trip blank samples were collected.

Duplicate samples from wells MW-1 and MW-8 were collected and transmitted to the U.S. Army Corps of Engineers, Missouri River Division Laboratory, Omaha, Nebraska, for independent analysis. An additional set of blind duplicate field samples were collected at well MW-1 and submitted to the ITAS and New Mexico State University laboratories for analysis. This blind duplicate sample is identified in Tables 2, 3, and 4 as well number MW-12, where the analytical results are listed along with the results for the M-1 sample analyses. Each duplicate sample fraction was collected from a new bail of ground water immediately after collecting the sample fraction in order to minimize variabilities due to time or sampling mechanics.

Because the samples for purgeable organic halides are collected in sample bottles having teflon septa within the bottle caps, trip blank samples are prepared prior to sampling in the field and accompany the field team and the collected samples on their route to the laboratory. Volatile contaminants can enter the POX samples through the septa caps, and the trip blank samples are one method used to determine whether or not this type of contamination has occurred. The POX trip blank samples were prepared at the IT-Albuquerque warehouse immediately prior to field personnel traveling to the sampling site, and were shipped to the analytical laboratory with the POX samples from the Holloman wells. As previously discussed,

samples for POX analysis were collected twice. Consequently, POX trip blank samples were prepared each time. The final POX trip blank sample was designated as well number MW-11. Results of the POX trip blank sample analysis are listed in Table 4, and indicate that no intransit contamination of the samples occurred.

Holding times for all sample analyses met the requirements specified in the A-E QCP/SP. Nonconformance to sampling procedures established the A-E QCP/SP were documented daily on an "A-E Daily Quality Control Report for Groundwater Monitoring at Holloman Air Force Base, New Mexico" form. These daily quality control reports are located in Appendix F.

5.0 REFERENCES

International Technology Corporation (IT), 1989a, "Safety, Health & Emergency Response Plan (A-E SHERP)," Ground Water Detection Monitoring Program," Holloman Air Force Base, New Mexico.

International Technology Corporation (IT), 1989b, "A-E Quality Control Plan and Sampling Plan (A-E QCP/SP) For Groundwater Study and Monitoring Program," Holloman Air Force Base, New Mexico.

Radian Corporation, 1989, "Hydrogeologic Investigation Report and Proposed Groundwater Monitoring Plan for the Sewage Treatment Lagoons, Holloman Air Force Base, NM 88330," Holloman Air Force Base, New Mexico.

TABLE 1

WATER VOLUMES PURGED FROM THE SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO SEPTEMBER 1989

MONITOR WELL	TOP OF[a] CASING ELEVATION (FAMSL)	DEPTH TO[b] GROUND WATER (FEET)	GROUND WATER ELEVATION (FAMSL)	TOTAL[b] DEPTH (FEET)	WELL VOLUME (GALLONS)	GALLONS DISCHARGED PRIOR TO SAMPLING	WELL VOLUMES DISCHARGED PRIOR TO SAMPLING
MW-1	4053.42	10.64	4042.78	17.83	4.7	24	5.1
S-2	4040.56	9.83	4030.73	20.27	1.7	8	4.7
MW-2	4039.78	5.19	4034.59	17.77	8.2	41	5.0
MW-3	4037.38	8.44	4028.94	17.76	6.1	31	5.1
MW-4	4030.30	5.44	4024.86	17.80	8.1	41	5.1
MW-5	4039.30	5.23	4034.07	17.75	8.2	41	5.0
MW-6	4031.21	6.27	4024.94	17.79	7.5	38	5.1
MW-7	4039.88	6.10	4033.78	17.74	7.6	40	5.3
MW-8	4040.50	5.73	4034.77	17.78	7.9	40	5.1
S-4	4034.46	8.85	4025.61	14.42	0.9	5	5.5

[a] A-E Groundwater Monitoring Report/Quality Control Summary for the First Groundwater Sampling Round Holloman Air Force Base, New Mexico, October 1989, Radian Corporation, Austin, Texas.
[b] Reference from top of casing. Measured on September 25, 1989.

HOL:T-1374/T1

TABLE 2

CONCENTRATIONS OF EPA INTERIM PRIMARY DRINKING WATER STANDARDS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO SEPTEMBER 1989

			MONITOR WELL					
PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	MW-1	MW-12 (DUPLICATE MW-1)	S-2	MW-2	MW-3	MW-4
Arsenic	µ g/l	50	7.0	7.0	8.0	3.0	12.0-U	6.0
Barium	µ g/l	1000	53.7	51.1	16.0	25.0	16.9	22.0
Cadmium	µ g/l	10	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U
Chromium	µ g/l	50	10-U	10-U	10-U	10-U	26.6	10-U
Fluoride	mg/l	1.4-2.4	1.3	1.3	3.4	1.3	1.4	0.9
Lead	µ g/l	50	20.0-U	30.0-U	28.0-U	30.0-U	22.0-U	7.0
Mercury	µ g/l	2	0.60	0.20-U	0.20-U	0.20-U	0.20-U	0.20-U
Nitrate (as N)	mg/l	10	2.8	3.0	2.7	0.12	0.10	0.08
Selenium	µ g/l	10	60.0-U	51.0-U	8.0-U	31.0-U	28.0-U	7.0-U
Silver	µ g/l	50	5.0-U	5.0-U	5.0-U	182	5.0-U	5.0-U
Endrin	µ g/l	0.2	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Lindane	µ g/l	4	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Methoxychlor	µ g/l	100	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Toxaphene	µ g/l	5	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U
2,4-D	µ g/l	100	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U
2,4,5-TP Silvex	µ g/l	10	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Radium[a]	pCi/l	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Gross Alpha[a]	pCi/l	15	<1	<1	3(1)	35(27)	<170	<2
Gross Beta[a]	pCi/l	4 millirem/yr[b]	<238	<253	60(27)	<60	<140	196(63)
Coliform Bacteria	col/100 ml	1/100 ml	<10	<10	<10	<100	<100	<10

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.
[a]Values in parentheses represent error ranges of ± two standard deviations.
[b]Refer to Code of Federal Regulations Title 40, Part 141.16 (40 CFR 141.16), for reference to relate analytical units (pCi/l) to maximum contaminant level (MCL).

TABLE 2

CONCENTRATIONS OF EPA INTERIM PRIMARY DRINKING WATER STANDARDS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO SEPTEMBER 1989

(CONTINUED)

			MONITOR WELL				
PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	MW-5	MW-6	MW-7	MW-8	S-4
Arsenic	µ g/l	50	16.0	7.0	8.0-U	12.0-U	6.0
Barium	µ g/l	1000	31.2	50.0	31.2	16.9	26.0
Cadmium	µ g/l	10	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U
Chromium	µ g/l	50	10-U	15.0	13.8	17.6	10-U
Fluoride	mg/l	1.4-2.4	2.1	0.9	2.1	0.7	1.0
Lead	µ g/l	50	4.0-U	88.0	32.0-U	4.0-U	61.1
Mercury	µ g/l	2	0.20-U	0.20-U	0.20-U	0.20-U	0.20-U
Nitrate (as N)	mg/l	10	0.12	2.5	0.18	0.13	26
Selenium	µ g/l	10	27.0-U	37.0-U	29.0-U	27.0-U	36.0-U
Silver	µ g/l	50	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U
Endrin	µ g/l	0.2	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Lindane	µ g/l	4	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Methoxychlor	µ g/l	100	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Toxaphene	µ g/l	5	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U
2,4-D	µ g/l	100	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U
2,4,5-TP Silvex	µ g/l	10	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Radium[a]	pCi/l	5	5.3(0.9)	10.1(1.5)	<5.0	<5.0	6.2(1.0)
Gross Alpha[a]	pCi/l	15	1(0.5)	<0.5	106(56)	2(1)	<0.7
Gross Beta[a]	pCi/l	4 millirem/yr[b]	76(39)	447(279)	<60	202(66)	<233
Coliform Bacteria	col/100 ml	1/100 ml	<10	<10	≥20	10	<10

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.
[a]Values in parentheses represent error ranges of ± two standard deviations.
[b]Refer to Code of Federal Regulations Title 40, Part 141.16 (40 CFR 141.16), for reference to relate analytical units (pCi/l) to maximum contaminant level (MCL).

TABLE 4

CONCENTRATIONS OF GROUND WATER CONTAMINATION INDICATOR PARAMETERS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO SEPTEMBER 1989

MONITOR WELL	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	TOTAL ORGANIC CARBON (mg/l)	PURGEABLE ORGANIC HALIDES (mg/l as Cl)
MW-1	6.73	61,300	1	0.50
	6.72	62,400	1-U	2.1
	6.71	62,900	1-U	1.0
	6.72	63,100	1-U	4.1
MW-12 (Duplicate MW-1)	NA	NA	2	<0.05
S-2	7.07	11,600	6	0.080
	7.11	11,500	6	<0.05
	7.13	11,700	5	0.090
	7.12	11,800	5	<0.05
MW-2	7.24	4,600	5	2.3
MW-3	6.96	16,500	9	0.70
MW-4	7.06	14,500	13	1.6
MW-5	6.85	13,500	7	0.50
MW-6	6.57	103,000	5	4.4
MW-7	6.94	8,100	4	<0.05
MW-8	6.90	11,800	5	1.1
S-4	6.86	67,900	1	3.4
MW-11 (trip blank)	NA	NA	NA	<0.05

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.

NA = Not Applicable.

TABLE 5

METHOD DETECTION LIMITS, SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO SEPTEMBER 1989

PARAMETER	DETECTION LIMIT
TOC	1 mg/L
POX	0.05 mg/L
Chloride	0.5 mg/L
Sulfate	1.5 mg/L
Phenols	0.01 mg/L
Nitrate/Nitrite	0.05/0.01 mg/L
Fluoride	0.1 mg/L
Arsenic	12 μg/L[a]
Lead	32 μg/L[a]
Mercury	0.2 μg/L
Selenium	60 μg/L[a]
Iron	50 μg/L
Manganese	15 μg/L
Sodium	200 μg/L
Barium	20 μg/L
Cadmium	5 μg/L
Chromium	10 μg/L
Silver	5 μg/L
Endrin	0.1 μg/L
Lindane	0.1 μg/L
Methoxychlor	0.1 μg/L
Toxaphene	0.5 μg/L
2,4-D	1.2 μg/L
2,4,5-TP (Silvex)	0.1 μg/L
Radium	5.0 pCi/l
Gross Alpha	170 pCi/l[a]
Gross Beta	253 pCi/l[a]
Coliform Bacteria	<100/100 mL[a]

[a]Detection limits are variable and sample specific. Value reported is the maximum limit of detection reported for any individual sample. Detection limits for most samples are less than table value.

HOL:T-1374/6

APPENDIX A

JOB LOGS

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

Page 1 of 1

Monday

COMPANY COE DATE 092589

LOCATION Holloman AFB JOB NUMBER 301251.02

WORK PERFORMED Ground water fluid levels/ total depths. Set up gear for RCRA groundwater sampling

PREPARED BY A. Houska SUPERVISOR D. Meyer

CLASS	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
	D Meyer	0745	1015	1/2 hr	1815	1830	
	A. Houska	0500	1015	1/2 hr	1745	1800	
	M. Lyon	0500	1015	1/2 hr	1745	1800	
	D. Dyer	0500	1015	1/2 hr	1745	1800	
	J. Boyd	0500	1015	1/2 hr	1745	1800	

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
	HNu PID				
	ORS Probe				
	Decon				
	Steel tape				

TIME	FIELD ACTIVITY DAILY LOG
0500	Meet at IT Warehouse, Pack gear/ equipment.
0530	Leave Albuquerque, Drive to Alamogordo.
0930	Arrive at Alamogordo; Purchase additional supplies;
	Check in at HAFB.
1015	Arrive at Wastewater Treatment Area; Unpack gear & get
	set-up.
1145	Go to lunch - 1/2 hr.
1215	Return from lunch; Hold Tailgate Safety Meeting
1250	Dyer, Boyd + Houska set-up at MW-1. Calibrate
	Equipment. Take HNu PID readings and fluid-level / total
	well depth measurements. D. MEYER, M. Lyon. Calibrate
	equipment, purchase supplies, decon equipment.
1640	Complete well-work; recalibrate equipment. Return to WW
	treatment area.
1745	Dyer, Boyd, Lyon, Houska leave WWT area; Check in motel.
1800	STOP: Dyer, Boyd, Lyon + Houska
1815	Meyer leaves WWT area, return to motel
1830	Meyer, Stop.

COMPLETE ONE SHEET FOR EACH SHIFT

30-6-65 12 54

INTERNATIONAL TECHNOLOGY CORPORATION

Page 1 of 2

JOB LOG

Tuesday

COMPANY CoE - OMAHA, NE DATE 092689

LOCATION Holloman AFB - JOB NUMBER 301251.02

WORK PERFORMED Sample GROUND WATER FROM INSTALLED WELLS - (RCRA) Sampling Procedure

PREPARED BY DAVID DYER SUPERVISOR

CLASS	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
	Dan Meyer	0700	0720	0	1700	1705	
	Ann Houska	0700	0720	0	1700	1705	
	Mark Lyon	0700	0720	0	1700	1705	
	John Boyd	0700	0720	0	1700	1705	
	David Dyer	0700	0720	0	*	1800	

* to Las Cruces 1500 hrs

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
2	PH meter		Misc. items		
1	Conductivity meter		Sample purchasing supplies		
	~~Turbidity meter~~				
	Asst. - Sample gear				
	Level D (4) people				
	Decon Equip				

FIELD ACTIVITY DAILY LOG

TIME	
0700	Leave motel -
0720	Arrive @ Base & purchase (10) Bags of ICE
0740	Load out Sample gear for (Two) Crews to Sample
	Correction - (one) Sample Team because only have one PH meter
0830	Leave Storage Shed & head to well # S-4 - M. Lyon - D. Dyer
	J. Boyd & A. Houska -
0855	Arrive @ well set up Equip - Label Bottles - Decon Equip
0915	Start Bailing purge H2O from well - will purge Apprx 7 gals -
1000	Sampling Starts -
1020	Decon of Equipment & Move to well # MW-06
1030	Set up Start to Bail - Purge 37.5 gals - PH & Conductivity
1145	Start Sampling on MW-06
1215	Stop Sampling Start Decon - mobilize MW-04
1250	Start Bailing on MW-04 - Set up Sample Bottles & gear
1350	Start sampling MW-04 after loosing bailer in MW-04

COMPLETE ONE SHEET FOR EACH SHIFT

30-6-65(12 54

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY Corps of Engineers

DATE Tuesday 092689

LOCATION Holloman AFB

JOB NUMBER 301251.02

WORK PERFORMED Sampling 4 monitor wells

PREPARED BY DMeyer

SUPERVISOR

CLASS	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
	as pg 1						

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
	as pg 1				

TIME	FIELD ACTIVITY DAILY LOG
1500	Lv MW-04 (JB, AH)
1400	Arr. S-2 (DD, ML)
1500	Begin sampling S-2 / DD lv S-2 to Las Cruces w/ coliform samples
1600	Complete sampling S-2
1530	JB, AH to shed to ship samples
1630	Check calibration of instruments / All samples shipped via Fed Ex
	(6 coolers + interface probe shipped)
1700	JB, AH, DM, ~~DD~~ ML lv shed

COMPLETE ONE SHEET FOR EACH SHIFT

30-8-65(12 5M

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

Page 1 of 3

COMPANY COE

DATE Wed 07 27 89

LOCATION HAFB - Wastewater Treatment Lagoon

JOB NUMBER 30.251.02

WORK PERFORMED RCRA quarterly water sample collection

PREPARED BY A. Horska

SUPERVISOR D. Meyer

CLASS	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
	D. Meyer	0630	[illegible]	—	[illegible]	[illegible]	
	A. Horska	0630	[illegible]	—			
	D. Dyer	0630	[illegible]	—	[illegible]	[illegible]	
	J. Bond	0630	[illegible]	—	[illegible]	[illegible]	
	M. Lyon	0630	[illegible]	—	[illegible]	[illegible]	

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
	Decon Equipment	~1 Box	Latex Gloves		
	Sample Collection Equip. Spail		Nitrile Gloves		
	pH meter X2		Vaseline		
	Conductivity meter		Sample packaging supplies		
5 bags	Ice				
12	Gallon water coolers				

FIELD ACTIVITY DAILY LOG

TIME	
0630	Leave motel, drive to HAFB. - Stop for ice at store
0650	Arrive at WWTF. Prep. for sampling + perform equipment calibration
0745	Sample teams to MW-1 and MW-7
1040	Sample team finishes at MW-7.
1045	Sample team finishes at MW-1; Prep for sampling MW-8. Other team prepares sample coolers [illegible]
1115	Sample team to MW-8.
1320	Sample team to MW-5
1430	Sample team finished at MW-8; [illegible]
1445	D. Dyer leaves to deliver calibration [illegible]
1450	Sample team finishes MW-5, [illegible]
	Sample packing, decon equipment, [illegible] equipment calibration.
1600	Fed. Express arrives - Sample shipment sent to IT [illegible]

COMPLETE ONE SHEET FOR EACH SHIFT D. Dyer [illegible]

1730 Stop rest of crew.

30-8-651 (12 5M)

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

Page 1 of 1

COMPANY COE DATE 10 Oct 89

LOCATION Holloman AFB - Wastewater Treatment Lagoons JOB NUMBER 30125

WORK PERFORMED GW Sampling for PCX (resampling).

PREPARED BY A. Houska SUPERVISOR J. Dawson

CLASS	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
HSE	A. Houska	0645	0700	1½ hr	1030	[illegible]	[illegible]
Tech	J. Boyd	0645	0700	1½ hr	1035	[illegible]	[illegible]

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
3 ea	Tyvek Suits				
	Sample Equipment.				
	Decon Equipment.				

FIELD ACTIVITY DAILY LOG

TIME	
0645	Leave motel. Drive to WWT area.
0710	J. Boyd set-up on + purges MW-5
0725	A. Houska set-up on + purges MW-7.
0810	A. Houska aids J. Boyd in sample collection at MW-5
0820	J. Boyd aids A. Houska in sample collection at MW-7
0840	Set up on MW-8. Purge ~~samp~~ well.
1000	Collect sample at MW-8.
1040	Clean-up site. Return to motel. Check-out. Begin return
~~[illegible]~~	drive to Albuquerque.
1230	Stop for lunch (1½ hr).
1300	Resume driving to Albuquerque.
1500	Arrive IT warehouse. Unload gear. Prepare [illegible]
1530	Stop

COMPLETE ONE SHEET FOR EACH SHIFT

30-6-651 2

APPENDIX B

FIELD DATA

GROUNDWATER FIELD DATA SHEET

HNu PID: Background = 0.3 ppm
Well Borehole Headspace = 0.5 ppm

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-010989 *
DATE (W-L Meas/Sampling)	9/25/89 / 09/27/89 / 10/04/89
TIME	0930
SAMPLER'S INITIALS	AMH, DB / AH, JB
WELL/BORING LOCATION	MW-01
WELL/BORING DIAMETER (in)	4" OD, Stainless Steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4053.42' FAMSL
WATER-LEVEL MEASUREMENT Time = 1325	—
Total Depth (ft)	17.83
Depth to Groundwater (ft)	10.64
CALCULATIONS	
Thickness of Groundwater (ft)	7.19
Well Volume (gallons)	4.68
Purge Volume (gallons)	23.40
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See next page
Conductance (µmhos)	/
Temperature (°C)	/

COMMENTS: See field notebook for equipment calibration data; equipment calibrated at beginning and end of day. See field notebook for decon procedure.

* Up-gradient well: 4 replicates for TOC and POX.
* An Environmental duplicate, identified
* Sample No. MW-120989 was also collected at this well
* A QA sample, sent to designated COE laboratory was also collected at this well, Sample No. = QMW-010989.

Each parameter was alternated between the three samples; ie. all phends collected co

INTERNATIONAL TECHNOLOGY CORPORATION

By AR.SB Date 092789 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2

Chkd. By ___ Date ___ MW-01 Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
~~0842~~	5	21.5	6.69	56,400	slightly cloudy
0842	9	21.5	6.71	57,900	" "
0902	13	21.5	6.70	58,400	" "
0914	17	21.5	6.70	59,300	" "
0925	21	22.0	~~6.73~~	59,400	" "
	~~24~~				
0935	24	21.5	6.69	60 500	" "

Reading after sample collection: 4 pH/SC readings [illegible]

1033	NA	22.5	6.73	61,500	slightly cloudy
1038	NA	22.0	6.72	62,400	" "
1043	NA	22.0	6.71	62,700	" "
1048	NA	22.0	6.72	63,100	" "

Turbidity Reading Before Sample Collection: NA

Turbidity Reading After Sample Collection: NA

Project No. 301251.02

HNu PID: Background = 0.4 ppm
Well Borehole Headspace 0.2 ppm

GROUNDWATER FIELD DATA SHEET

Parameter Description	Value
SAMPLE CONTROL NUMBER	S-020989
DATE (W-L Meas/ Sampling)	9/25/89 / [illegible] / 100489 (P[illegible]
TIME	1500
SAMPLER'S INITIALS	M Lyon D. Dyer / A.H, JB
WELL/BORING LOCATION	S-2
WELL/BORING DIAMETER (in)	2" OD, PVC
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	Not on well casing —
WATER-LEVEL MEASUREMENT Time = 1340	—
Total Depth (ft)	20.27
Depth to Groundwater (ft)	9.83
CALCULATIONS	
Thickness of Groundwater (ft)	10.44
Well Volume (gallons)	1.70
Purge Volume (gallons)	8.49
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See Next Page
Conductance (µmhos)	
Temperature (°C)	

COMMENTS: See field notebook for equipment calibration data; equipment calibrated at beginning and end of day. See field notebook for decon procedure

* Up-gradient well: 4 replicates collected for TOC + POX.

INTERNATIONAL TECHNOLOGY CORPORATION

By MCL Date 9-26-89 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2

Chkd. By ___ Date ___ Well S-2 Proj. No. 301251.02

No Elevation on casing

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
1420				START 1st Bail	very Turbid in bottom
1426	2	19.5	6.89	13,900	slightly no odor green
1435	4	19.0	6.99	14,500	slightly turbid
1439	6	19.0	7.05	13,200	clearing
1443	8	19.0	7.09	12,800	slightly turbid

Reading after sample collection:

1516	–	19.0	7.07	11 600	clear
1520	–	19.0	7.11	11 500	"
1526	–	18.5	7.13	11 700	"
1529	–	18.0	7.12	11800	"

Turbidity Reading Before Sample Collection: NA

Turbidity Reading After Sample Collection: NA

Project No. 301251.02

GROUNDWATER FIELD DATA SHEET

HNu PID: Background = 0.25 ppm
Well Borehole Headspace = 0.20 ppm

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-020989
DATE (W-L Meas / Sampling)	9/25/89 / 092889 / 100489
TIME	0845 *
SAMPLER'S INITIALS	AMH, JB / AH, JB
WELL/BORING LOCATION	MW-2
WELL/BORING DIAMETER (in)	4" OD; stainless steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4039.78 FAMSL
WATER-LEVEL MEASUREMENT Time = 1407	
Total Depth (ft)	17.77
Depth to Groundwater (ft)	5.19
CALCULATIONS	
Thickness of Groundwater (ft)	12.58
Well Volume (gallons)	8.19
Purge Volume (gallons)	40.94
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See next page
Conductance (µmhos)	
Temperature (°C)	

COMMENTS: See field notebook for equipment calibration data; equipment calibrated at beginning and end of day. See field notebook for decon. procedure

* Coliform bacteria at time = 0905

INTERNATIONAL TECHNOLOGY CORPORATION

By AH, SB Date 092889 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2
Chkd. By ___ Date ___ MW-2 Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
0812	7.	22.6	7.29	4,200	s. cloudy to clear; no odor
0819	14	22.1	7.26	4,100	"
0826	21	22.5	7.25	4,200	"
0832	28	22.4	7.23	4,200	"
0841	35	22.2	7.23	4,100	"
0848	41	22.5	7.24	4,300	"

Reading after sample collection:

0906	—	22.9	7.24	4,600	

Turbidity Reading Before Sample Collection: N/A
Turbidity Reading After Sample Collection: N/A

Project No. 301251.02

GROUNDWATER FIELD DATA SHEET

HNu PID Background = 0.25 ppm
Well Borehole Headspace = 0.15 ppm

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-030989
DATE (W-L Meas/Sampling)	~~9/25/89~~ /09/28/89 /
TIME	0900,
SAMPLER'S INITIALS	DD, ML / AH, JB
WELL/BORING LOCATION	MW-3
WELL/BORING DIAMETER (in)	4" OD, Stainless Steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4037.38 FAMSL
WATER-LEVEL MEASUREMENT Time = 1500	—
Total Depth (ft)	17.76
Depth to Groundwater (ft)	8.44
CALCULATIONS	
Thickness of Groundwater (ft)	9.32
Well Volume (gallons)	6.07
Purge Volume (gallons)	30.33
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See next page.
Conductance (µmhos)	
Temperature (°C)	

COMMENTS: See field notebook for equipment calibration data; equipment calibrated at beginning and end of day. See field notebook for decon procedure

INTERNATIONAL TECHNOLOGY CORPORATION

By [illegible] Date 9/28 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2

Chkd. By ___ Date ___ MW-3 Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
0818	5 Gal	21.5	6.92	17,500	nearly clear slightly green
0825	10	21.0	6.92	16,900	"
0832	15	21.0	6.98	17,000	"
0838	20	21.0	7.00	16,700	Some degassing non transparent viscosity
0844	25	20.5	6.94	16,800	
0852	31	21.0	6.98	16,200	slight green

Reading after sample collection:

[illegible]	NA	21.0	6.96	16,500

Turbidity Reading Before Sample Collection:

Turbidity Reading After Sample Collection:

Temp read w/ pH meter thermocouple - rounded to nearest 0.5 ~~[illegible]~~ ~~unit~~ °C

Project No. 301251.02

HNu PID: Background = 0.25 ppm
Well Borehole Headspace - 0.15 ppm

GROUNDWATER FIELD DATA SHEET

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-040989
DATE (W-L Meas/Sampling)	9/25/89 / 9/26/89 / 100481
TIME	1400
SAMPLER'S INITIALS	AMH, JB / AH, JB
WELL/BORING LOCATION	MW-4
WELL/BORING DIAMETER (in)	4" OD, SS Steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4030.30 MSL
WATER-LEVEL MEASUREMENT Time = 1532	—
Total Depth (ft)	17.8
Depth to Groundwater (ft)	5.44
CALCULATIONS	
Thickness of Groundwater (ft)	12.36
Well Volume (gallons)	8.04
Purge Volume (gallons)	40.22
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See back page
Conductance (µmhos)	
Temperature (°C)	

COMMENTS: See field notebook for equipment calibration data; equipment calibrated at beginning and end of day. See field notebook for decon procedure.

INTERNATIONAL TECHNOLOGY CORPORATION

By [redacted] Date 092689 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2

Chkd. By ____ Date ____ MW-4 Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
1304	6	24.5	6.56	15,800	clear
1308	12	22.0	6.59	16,500	clear
1318	18	22.0	6.37	17,000	clear
1325	24	21.5	6.36	16,900	clear
1330	30	21.5	6.46	16,400	clear
1336	36	21.5	6.59	16,700	"
1403	41	21.0	6.55	17,600	"

Reading after sample collection:

1524	22.0	7.06	14,500	clear

Turbidity Reading Before Sample Collection: NA

Turbidity Reading After Sample Collection: NA

Project No. 301251.02

GROUNDWATER FIELD DATA SHEET

HNu PID : Background = 0.3 ppm
Well Borehole Headspace = 0.25 ppm

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-050989
DATE (W-L Meas/Sampling)	9/25/89 / 9/27/89 / 100589
TIME	1430 (POX)
SAMPLER'S INITIALS	amH, JB, ML / aH, JB
WELL/BORING LOCATION	MW-5
WELL/BORING DIAMETER (in)	4" OD, S.Steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	1039.30 EAMSL
WATER-LEVEL MEASUREMENT Time = 1427	—
Total Depth (ft)	17.75
Depth to Groundwater (ft)	5.23
CALCULATIONS	
Thickness of Groundwater (ft)	12.52
Well Volume (gallons)	8.14
Purge Volume (gallons)	40.74
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook /
pH	See back page
Conductance (μmhos)	/
Temperature (°C)	

COMMENTS: See field notebook for equipment calibration data; equipment calibrated at beginning and end of day. See field notebook for decon. procedure.

INTERNATIONAL TECHNOLOGY CORPORATION

By AH, JB, MC Date 092789 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2

Chkd. By ___ Date ___ MW-5 Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
1325	7	22.0	6.88	12,100	Slightly cloudy, no odor
1335	14	22.5	6.87	13,600	" "
1345	21	22.5	6.88	13,600	
1355	28	22.0	6.85	13,700	
1405	35	22.0	6.85	13,600	
1415	41	21.5	6.85	13700	
					outgasses when poured

Reading after sample collection:

1432	22.0	6.85	13,500

Turbidity Reading Before Sample Collection: NA

Turbidity Reading After Sample Collection: NA

108-10-85

Project No. 301251.02

GROUNDWATER FIELD DATA SHEET

HNu PID: Background = 0.2 ppm
Well Borehole Headspace = 0.1 ppm

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-060989
DATE (W-L Meas/Sampling)	9/25/89 / 09/26/89 / 100489 (PO
TIME	1215
SAMPLER'S INITIALS	ML, DD / AH, JB
WELL/BORING LOCATION	MW-6
WELL/BORING DIAMETER (in)	4" OD; S. Steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4031.21 AMSL
WATER-LEVEL MEASUREMENT Time = 1608	—
Total Depth (ft)	17.79
Depth to Groundwater (ft)	6.27
CALCULATIONS	
Thickness of Groundwater (ft)	11.52
Well Volume (gallons)	7.50
Purge Volume (gallons)	37.49
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See Next Page
Conductance (µmhos)	" " "
Temperature (°C)	" " "

COMMENTS: See field notebook for equipment calibration data; equipment calibrated at beginning and end of day. See field notebook for decon procedure.

INTERNATIONAL TECHNOLOGY CORPORATION

By [illegible] Date 9-26-99 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2
Chkd. By ___ Date ___ SAMPLING MW-6 Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
1035	Ø				1st 2 + BAILS WERE SILTY
1047	5	22.0	7.38	99,200	silty greenish cloudy, no odor
1056	10	22.0	7.15	97,900	cloudy greenish, no odor
1105	15	22.5 (in sun)	6.98	98,300	" "
1112	20	21.5	6.86	99,200	clearing greenish, no odor
1119	25	21.5	6.73	98,600	greenish yellow
1127	30	21.5	6.70	100,600	greenish
1135	35	21.5	6.63	100,300	greenish, no odor
1138	38	21.5	6.62	100,700	greenish

Reading after sample collection:

1120	—	22.0 (in sun)	6.57	103,000	greenish but fairly clear, no odor

Tried to keep sample jar in shade during readings @ 15 gal and after sample the sun got on the sample jar

Turbidity Reading Before Sample Collection: NA
Turbidity Reading After Sample Collection: NA

Project No. 301251.02

GROUNDWATER FIELD DATA SHEET

HNu PID: Background = 2.5 ppm
Well Borehole Headspace = 1.5 ppm

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-070989
DATE (W-L Meas / Sampling)	~~09/25/89~~ / 09/27/89 / 1005 PC
TIME	0930
SAMPLER'S INITIALS	ML, DD / aH, JB
WELL/BORING LOCATION	MW-7
WELL/BORING DIAMETER (in)	4" OD; S. Steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	AMSL 4039.88
WATER-LEVEL MEASUREMENT Time = 1438	
Total Depth (ft)	17.74
Depth to Groundwater (ft)	6.1
CALCULATIONS	
Thickness of Groundwater (ft)	11.64
Well Volume (gallons)	7.58
Purge Volume (gallons)	37.88
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See back page
Conductance (μmhos)	
Temperature (°C)	

COMMENTS: See field notebook for equipment calibration data; equipment calibrated at beginning and end of day. See field notebook for decon procedure.

INTERNATIONAL TECHNOLOGY CORPORATION

By MG Date 9-27-89 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2

Chkd. By ____ Date ____ MW-7 well Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
0859	10	21.0	6.76	8600	slightly green w/ turbid odor
0906	15	22.0	6.83	8500	"
0913	20	22.0	6.86	8300	"
0920	25	22.0	6.88	8300	"
0926	30	22.0	6.87	8100	"
0934	35	22.0	6.89	8100	"
0939	40	22.0	6.91	8100	"

Broken Thermo.

Reading after sample collection:

1050		23.1	6.94	8100	"

temp read w/ Orion pH meter — Thermocouple thermometer broke

Turbidity Reading Before Sample Collection: NA
Turbidity Reading After Sample Collection: NA

Conductivities were ~~read~~ collected at time indicated above, put into Decon'd bottles after rinsing with sample water and sp. cond read at 1050 hrs on 200,000 umhos/cm scale

Project No. 301251.02

GROUNDWATER FIELD DATA SHEET

HNu PID: Background = 0.4 ppm
Well Borehole = 0.2 ppm

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-080989 *
DATE (MW-L Meas/Sampling)	~~9/25/89~~ / 09/27/89 / 10058 (PC
TIME	1300
SAMPLER'S INITIALS	DD, ML / QH, JB
WELL/BORING LOCATION	MW-08
WELL/BORING DIAMETER (in)	4" OD; S. Steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	AMSL 4040.50
WATER-LEVEL MEASUREMENT Time = 1356	
Total Depth (ft)	17.78
Depth to Groundwater (ft)	5.73
CALCULATIONS	
Thickness of Groundwater (ft)	12.05
Well Volume (gallons)	7.84
Purge Volume (gallons)	39.21
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See next page
Conductance (µmhos)	
Temperature (°C)	

COMMENTS: See field notebook for equipment calibration data; equipment calibration at beginning and end of day. See field notebook for decon procedure

* Note: COE QA sample also collected at this well. Sample ID = QMW-080989. Parameters were alternated.

INTERNATIONAL TECHNOLOGY CORPORATION

By [illegible] Date 09/27/89 Subject RCRA GW Sampling-HAFB Sheet No. 2 of 2

Chkd. By ____ Date ____ WELL MW-8 Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
1203	5	22.0	6.76	10,000	sl. cloudy
1210	10	22.0	6.88	12,200	" "
1215	15	21.5	6.88	14,700	" "
1221	20	21.5	6.90	12,400	" "
1225	25	21.5	6.90	11,700	" "
1231	30	22.0	6.92	11,700	" "
1237	35	22.0	6.91	12,200	" "
1245	40	22.0	6.90	12,000	" "

Reading after sample collection:

1315	NA	22.0	690	11,800	" "

Turbidity Reading Before Sample Collection: NA

Turbidity Reading After Sample Collection: NA

~~1~~ 1145

Recalibrated pH meter on 7.00 for cal 1

Model SA 320 on 4.00 for cal 2

Read pH 10.00 buffer @ 9.98

Project No. 301251.02

GROUNDWATER FIELD DATA SHEET

HNu PID : Background = 0.2 ppm
Well Bore hole = 0.1 ppm

Parameter Description	Value
SAMPLE CONTROL NUMBER	S-040989
DATE (W-L Meas/Sampling)	9/25/89 / 9/26/89 / 10/04/89
TIME	1000
SAMPLER'S INITIALS	JMH, JB / AH, JB
WELL/BORING LOCATION	S-4
WELL/BORING DIAMETER (in)	2" OD; PVC
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	Not on well casing AMSL
WATER-LEVEL MEASUREMENT Time = 1623	—
Total Depth (ft)	14.42
Depth to Groundwater (ft)	8.85
CALCULATIONS	
Thickness of Groundwater (ft)	5.57
Well Volume (gallons)	0.91
Purge Volume (gallons)	4.53
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See Back Sheet (2 of 2)
Conductance (µmhos)	"
Temperature (°C)	"

COMMENTS: See field notebook for equipment calibration data; equipment calibration at beginning and end of day. See field notebook for decon. procedure.

INTERNATIONAL TECHNOLOGY CORPORATION

By [illegible] Date 092689 Subject RCRA GW Sampling-HAFB S-4 Sheet No. 2 of 2

Chkd. By ____ Date ____ Proj. No. 301251.02

Purging Data

Time	Volume (Gal.)	Temp (°C)	pH	SC (umhos/cm)	Comments
9:25	1	25.5	6.99	67,400	s. cloudy; no odor
9:29	2	25.0	7.05	67,900	s. cl/clear; no odor
9:33	3	22.0	7.05	66,800	s. cloudy/clear; no odor
9:36	4	21.5	7.07	67,600	" " ; "
9:40	5	21.5	7.12	67,400	" " ; "

Reading after sample collection:

10:48	—	22.0	6.86	67,900	s. cloudy/clear no odor

Turbidity Reading Before Sample Collection: NA

Turbidity Reading After Sample Collection: [illegible]

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After field-Use Calibration

IT CORPORATION

WATER LEVEL INDICATOR CALIBRATION

EQUIPMENT NUMBER SN ~~801577~~ 00133

EQUIPMENT NAME ORS Interface Probe

DATE 092589/1645 hr DATE LAST CALIBRATED Unknown

CALIBRATION PERIOD Calibrated against stainless-steel tape to 40.0'.

Interface Probe MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)
0	NA								
5	5.0	105		205		305		405	
10	10.0	110		210		310		410	
15	15.0	115		215		315		415	
20	20.0	120		220		320		420	
25	25.0	125		225		325		425	
30	30.0	130		230		330		430	
35	35.0	135		235		335		435	
40	40.0	140		240		340		440	
45	—	145		245		345		445	
50	—	150		250		350		450	
55	—	155		255		355		455	
60		160		260		360		460	
65		165		265		365		465	
70		170		270		370		470	
75		175		275		375		475	
80		180		280		380		480	
85		185		285		385		485	
90		190		290		390		490	
95		195		295		395		495	
100		200		300		400		500	

NOTE: ACCEPTANCE IS ± 0.1 FEET

SIGNED Ann M Houdek

APPENDIX C

SAMPLE CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117943

C/C Control No. 117302

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214394

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S04G989	Well # S-4	9-26-89; 1000	Groundwater	Amber Glass	OK 9-27-89	
				" "		
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp, 092689, 1625
   Received By: [illegible] ITAS 9-27-89 0900
2. Relinquished By:
   Received By:
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44233

00263

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117943
C/C Control No. 117302

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: —

DATE SAMPLES SHIPPED: 09/26/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10-16-89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-040989	Ground water	~~2x40ml vom~~ 250 ml.	iced ; H_2SO_4	TOC	See attached sheets
		1 Gal.	; None	Pest. / Herb.	for specific analytical
		1 ℓ	; HNO_3	Total metals	requirements.
		1 ℓ	; H_2SO_4	Phenolics	
		1 ℓ	; None	Wet Chem.	
		1 ℓ	; H_2SO_4	NO_2, NO_3,	
		2x 1 ℓ	; None	Rad chem.	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By S Harris ITAS Date/Time 9-27-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44233

00259

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117957

C/C Control No. 117305

PROJECT NAME/NUMBER COE-Holloman AFB/301251,02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214350

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-060989	~~Spar~~ Well MW-6	092689; 1215	Ground Water	Amber glass	OK 9-27-89	
		092689; 1215		" "		
		092689; 1215		CPE		
		092689; 1215		Amber glass		
		092689; 1215		CPE		
		092689; 1215		Amber glass		
		092689; 1215		CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp; 092689; 1604

   Received By: S. Harris ITAS 9-27-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

1TNA 44233

00261

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117957
C/C Control No. 117305

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: —

DATE SAMPLES SHIPPED: 09/26/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10 ~~09~~/16/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-060989	ground water	~~250 ml~~ ~~2 x 40 ml VOA~~	iced ; H_2SO_4	TOC	See Attached list
↓	↓	1 gal	↓	Pest, Herb	for specific analytical
		1 l	; HNO_3	T Metals	requirements
		1 l	; H_2SO_4	Phenolics	
		1 l		Wet Chem.	
		1 l	; H_2SO_4	NO_2, NO_3	
↓	↓	2 x 1 l	↓	Rad Chem	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By S Harris ITAS Date/Time 9-27-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44233

002257

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117940

C/C Control No. 117303

PROJECT NAME/NUMBER COE-Holloman AFb/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214383

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
mw-040989	Well #MW-4	9-26-89; 1400	Ground Water	Amber Glass	OK 9-27-89	
		; 1400		Amber Glass		
		; 1400		CPE		
		; 1400		Amber Glass		
		; 1400		CPE		
		; 1400		Amber Glass		
		; 1400		CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, ITCorp; 092689; 1620

   Received By: S Harris ITAS 9-27-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44233

00260

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117940
C/C Control No. 117303

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. —

DATE SAMPLES SHIPPED: 09/26/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/16/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-040989	Ground Water	250 ml	iced; H_2SO_4	TOC	See Attached List
↓	↓	1 gal	; None	Pest, Herb	for specific analytical
		1 l	; HNO_3	T. Metals	requirements
		1 l	; H_2SO_4	Phenolics	
		1 l	; None	Wet Chem	
		1 l	; H_2SO_4	NO_2, NO_3	
↓	↓	2 x 1 l	; None	Rad Chem.	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By S Harris ITAS Date/Time 9-27-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44233

00256

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117941

C/C Control No. 117306

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214372

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S-020989	well # 6-2	9-26-89; 1500	Ground water	Amber Glass	OK SQR 9-27-89	
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		
				Amber Glass ~~CPE~~		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, ITCorp, 092689, 1615

   Received By: S Harris ITAS 9-27-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44233

00262

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117941
C/C Control No. n7306

PROJECT NAME: COE-Holloman AFb
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: —

DATE SAMPLES SHIPPED: 09/26/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10-16-89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-020989	Ground water	250 mL	iced; H_2SO_4	TOC	See attached sheets
↓	↓	1 gal.	None	Pest./Herb	for specific analytical
		1 l	HNO_3	Total Met.	requirements.
		1 l	H_2SO_4	Phenolics	
		1 l	None	Wet. Chem.	
		1 l	H_2SO_4	NO_2, NO_3	
↓	↓	2X1 l	None	Rad. Chem.	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal ✓ Rush ___ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ___ Flammable ___ Skin Irritant ___ Highly Toxic ___ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ___ Disposal by Lab ✓

FOR LAB USE ONLY
Received By S Harris ITAS Date/Time 9-27-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44233

00258

IT ANALYTICAL SERVICES
QC SAMPLE INITIATION FORM
CODING

Contract No: COE-Hollman AFB
Matrix: Water
Parameters: CLP Metals
Project Code: ITNA 44233

Original Sample: JJ6526 (MW-040989)
Matrix Spike: JJ6527
Matrix Spike Dup: JJ6528
Date Initiated: 9-27-89
Date Completed:

Project Code	Sample ID	QC Samples
1) ITNA 44233, 9-27-89	JJ6526	JJ6527,28
2)	JJ6529	
3)	30	
4)	31	
5)		
6)		
7)		
8)		
9)		
10)		
11)		
12)		
13)		
14)		
15)		
16)		
17)		
18)		
19)		
20)		

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118466

C/C Control No. 117394

PROJECT NAME/NUMBER ITNA 44233

LAB DESTINATION IT-RSL

SAMPLE TEAM MEMBERS

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
JJ6506	MW-040989	9-26-89	water	2x1l analyze		
JJ6507	MW-060989	↓	↓	↓		
JJ6508	S-020989					
JJ6509	S-040989					

Special Instructions: Use new interco. report format. Report + invoice using both lab + client ID's

Possible Sample Hazards: See attachment for methods + det. limits.

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: S Harris ITAS 9-27-89 1600

Received By:

2. Relinquished By:

Received By:

3. Relinquished By:

Received by:

4. Relinquished By:

Received By:

WHITE - To accompany samples
YELLOW - Field copy

00265

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118466
C/C Control No. 117394

PROJECT NAME: ITNA 44233
PROJECT NUMBER:
PROJECT MANAGER:
BILL TO: ITAS
5815 Middlebrook PK
Knoxville, TN 37921
PURCHASE ORDER NO. 486000.04

DATE SAMPLES SHIPPED: 9-28-89
LAB DESTINATION: IT-RSL
LABORATORY CONTACT:
SEND LAB REPORT TO: ITAS - Middlebrook
DATE REPORT REQUIRED: 10-16-89
PROJECT CONTACT: Mary Tyler
PROJECT CONTACT PHONE NO. 588-6401

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
JJ6506	water	2l	None		See C of C
JJ6507	↓	↓	↓	Radium, Gross α, Gross β	
JJ6508					
JJ6509					

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of [redacted]stances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy

00266

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117961

C/C Control No. 117291

PROJECT NAME/NUMBER COE Holloman AFB/301251.02

LAB DESTINATION NM State University-Las Cruces

SAMPLE TEAM MEMBERS A. Houska, H. Lyon

CARRIER/WAYBILL NO. ~~Enclosed-Impress~~ Hand Delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S-2409 89	well # S-4	9-26-89 1040	groundwater	CPE		
MW 0ECS89	well # MW-6	1215				
MW 2409 89	well # MW-04	1400				
S 0209 89	well # S-2	1500				

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp, 092689; 1500

   Received By: [illegible] IT Corp 092689 1500

2. Relinquished By: [illegible] 9/26/89 [illegible]

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117961
C/C Control No. 117291

PROJECT NAME: COE-Hollman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: N/A

DATE SAMPLES SHIPPED: 09/26/89
LAB DESTINATION: NM State Univ-Las Cruces
LABORATORY CONTACT: Andy Bristol
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87100
DATE REPORT REQUIRED: 10-16-89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
	Ground Water	~~120 ml~~ 500 ml.	iced	Coloform Bacteria	See attached
S-040989	↓	↓	↓	↓	sheets for specific
MW-060989					analytical requirements.
MW-040989					
S-020989					

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By Sharon Smith Date/Time 9-26-89 4:30pm

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117968

C/C Control No. 117299

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214453

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-010989	Well MW-1	092789; 0930	Ground Water	Amber Glass	OK [illegible] 92889	
↓	↓	↓	↓	" "	↓	
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 092789, 1530

   Received By: S Harris ITAS 92889 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00395

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44238

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117968
C/C Control No. 117299

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. —

DATE SAMPLES SHIPPED: 09/27/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/17/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-010989	Ground Water	250 ml	Iced ; H_2SO_4	TOC	See Attached list
↓	↓	1 gal.	; none	Pest, Herb	for specific
		1 l	; HNO_3	T. Metals	analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l	; none	Wet Chem.	
		1 l	; H_2SO_4	NO_2, NO_3	
		2x 1 l	; none	Rad. Chem	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By S. Fabrini ITAS Date/Time 9-28-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITAS 000391

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117969

C/C Control No. 117301

PROJECT NAME/NUMBER COE- Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214453

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-120989	Well MW-12	092789; 1030	Ground Water	Amber Glass	OK 8922/92889	
↓	↓	↓	↓	" "	↓	
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		

Special Instructions: IF sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, ITCorp, 092789; 1630

   Received By: S Harris, ITAS 92889 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44238

00398

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117969
C/C Control No. 117301

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite700
Albuquerque, NM 87108
PURCHASE ORDER NO.:

DATE SAMPLES SHIPPED: 09/27/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technolgoy
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/17/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-120989	Ground Water	250 ml	iced ; H_2SO_4	TOC.	See attached list
		1 gal	; none	Pest, Herb	for specific
		1 l	; HNO_3	T. Metals	analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l	; none	Wet Chem	
		1 l	; H_2SO_4	NO_2, NO_3	
		2 x 1 l	; none	Rad Chem	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By S Harris ITAS Date/Time 92889 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00394

ITA 46138

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117939

C/C Control No. 117300

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214453

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-080989	Well MW-08	092789; 1300	Ground Water	Amber Glass	OK 92889	
				" "		
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp, 092789; 1635

   Received By: S Hamin ITAS 92889 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00397

ITNA 44238

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117939
C/C Control No. 117300

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: ——

DATE SAMPLES SHIPPED: 09/27/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/17/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-080989	Ground Water	250 ml	Iced ; H_2SO_4	TOC	See Attached List
↓	↓	1 gal	; none	Pest, ~~Metals~~ Herb	for specific
		1 l	; HNO_3	T. Metals	analytical
		1 l	; H_2SO_4	Phenolics	requirements
		1 l	; none	Wet Chem.	
		1 l	; H_2SO_4	NO_2, NO_3	
		2 x 1 l	; none	Rad, Chem.	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By S Harris ITAS Date/Time 92889 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00393

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117967

C/C Control No. 117298

PROJECT NAME/NUMBER COE-Holloman AFb/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214453

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-050989	Well MW-05	092789; 1430	Ground Water	Amber Glass	OK 92889	
				" "		
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		
					Cooler rec'd with	
					no custody seal.	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, ITCorp, 092789; 1622

   Received By: S. Harris ITAS 92889 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00396

ITNA 44238

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117967
C/C Control No. 117298

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. —

DATE SAMPLES SHIPPED: 09/27/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International TEchnology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/17/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-050989	Ground Water	250 ml	iced; H_2SO_4	TOC	See attached list
↓	↓	1 gal	; none	Pest, Herb	for specific
		1 l	; HNO_3	T. Metals	analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l	; none	Wet Chem.	
		1 l	; H_2SO_4	NO_2, NO_3	
		2 x 1 l	; none	Rad, Chem.	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By S. Harris ITAS Date/Time 9-28-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00392

IT ANALYTICAL SERVICES
QC SAMPLE INITIATION FORM
CODING

Contract No: COE-Hollman AFB
Matrix: Water
Parameters: CLP Metals
Project Code: ITNA 44233

Original Sample: JJ6526 (MW-040989)
Matrix Spike: JJ6527
Matrix Spike Dup: JJ6528
Date Initiated: 9-27-89
Date Completed:

Project Code	Sample ID	QC Samples
1) ITNA 44233, 9-27-89	JJ6526	JJ6527,28
2)	JJ6529	
3)	30	
4)	31	
5) ITNA 44238, 9-28-89	JJ6572	
6)	73	
7)	74	
8)	75	
9)		
10)		
11)		
12)		
13)		
14)		
15)		
16)		
17)		
18)		
19)		
20)		

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118465

C/C Control No. 117392

PROJECT NAME/NUMBER ITNA 44238

LAB DESTINATION IT-RSL

SAMPLE TEAM MEMBERS

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
JJ6552	MW-010989	9-27-89	water	2x1l nalgene		
JJ6553	MW-050989					
JJ6554	MW-080989					
JJ6555	MW-120989					

COPY

Special Instructions: Use new intercompany report format. Use both lab & client IDs on report + invoice.

Possible Sample Hazards: See attachment for methods & det. limits

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: S Harris ITAS 9-28-89 1200

Received By:

2. Relinquished By:

Received By:

3. Relinquished By:

Received by:

4. Relinquished By:

Received By:

WHITE - To accompany samples
YELLOW - Field copy

00700

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118465
C/C Control No. 117392

PROJECT NAME: ITNA 44238
PROJECT NUMBER:
PROJECT MANAGER:
BILL TO: ITAS - Middlebrook

PURCHASE ORDER NO. 486000.04

DATE SAMPLES SHIPPED: 9-29-89
LAB DESTINATION: IT-RSL
LABORATORY CONTACT:
SEND LAB REPORT TO: ITAS - Middlebrook

DATE REPORT REQUIRED: 9-17-89
PROJECT CONTACT: Mary Tyler
PROJECT CONTACT PHONE NO. 588-6401

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
JJ6552	water	2l		Radium, Gross α, Gross β	See C of C
JJ6553	↓	↓			
JJ6554					
JJ6555					

COPY

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of [redacted] ose)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

00001

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117960

C/C Control No. 117290

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION NM State University-Las Cruces

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. ~~Federal Express~~ Hand Delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-010789	Well MW-1	092789, 1030	Ground Water	CPE		
MW-120789	Well MW-12	092789, 1030	↓	↓		
MW-080789	Well MW-08	092789, 1300	↓	↓		
MW-070789	Well MW-07	092789, 1030	↓	↓		
MW-050789	Well MW-05	092789, 1430	↓	↓		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [illegible] Houska, IT Corp, 092789, 1500

   Received By: [illegible] Lyon, IT Corp, 092789, 1500

2. Relinquished By: [illegible]

   Received By: [illegible] 9-27-89, 4:10pm

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117960
C/C Control No. 117290

PROJECT NAME	COE-Holloman AFB	DATE SAMPLES SHIPPED	09/27/89
PROJECT NUMBER	301251.02	LAB DESTINATION	NM State Univ-Las Cruces
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Andy Bristel
BILL TO	International Technology Corp 5301 Central Ave NE Suite 700 Albuquerque NM 87108	SEND LAB REPORT TO	International Technology 5301 Central Ave NE Ste 700 Albuquerque, NM 87108
PURCHASE ORDER NO.	N/A	DATE REPORT REQUIRED	10/17/89
		PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-010989	Ground Water	~~120 ml~~ 500 ml	iced	Coloform Backeria	See Attached sheets
MW-120989	↓	↓	↓	↓	for specific
MW-080989					analytical requirements
MW-070989					
MW-050989					

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By Sharon M **Date/Time** 9-27-89 7:10 pm

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117958

C/C Control No. 117281

PROJECT NAME/NUMBER CPE-Holloman AFB/301251.02

LAB DESTINATION USACE-Missouri River Division

SAMPLE TEAM MEMBERS A. Houska, B. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214556

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-010789	Well MW-01	092789, 0930	Ground Water	Amber Glass		
↓	↓	↓	↓	" "		
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
↓	↓	↓	↓	CPE		
↓	↓	↓	↓	Clear VOAs		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological.

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, ITCorp, 092789, 1600

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117958
C/C Control No. 117281

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: —

DATE SAMPLES SHIPPED: 09/27/89
LAB DESTINATION: ~~USACE-Missouri River Div~~ La
LABORATORY CONTACT: ~~Dr. Joe Solsky~~
SEND LAB REPORT TO: ~~International Technology~~ Co
~~5301 Central Ave NE Ste~~ 700
~~Albuquerque NM 87108~~
DATE REPORT REQUIRED: 10/17/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-010989	Ground Water	250 ml	iced; H_2SO_4	TOC	See attached sheets
		1 gal.	; none	Pest, Herb	for specific
		1 l	; HNO_3	T. Metals	analytical requirements.
		1 l	; H_2SO_4	Phenolics	
		1 l	; none	Wet Chem	
		1 l	; H_2SO_4	NO_2, NO_3	
		2 x 1 l	; none	Rad Chem.	
		2 x 40 ml	; HCl	POX	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117965

C/C Control No. 117283

PROJECT NAME/NUMBER COE-Hobloman AFB/301251/02

LAB DESTINATION USACE-Missouri River Division

SAMPLE TEAM MEMBERS A. Houska, H. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214556

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-080939	Well MW-08	092789; 1300	Ground Water	Amber Glass		
				"		
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		
				Clear VOAs		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Dan M Houska, IT Corp, 092789; 1602

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117965
C/C Control No. 117283

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: —

DATE SAMPLES SHIPPED: 09/27/89
LAB DESTINATION: USACE-Missouri River Div Lab
LABORATORY CONTACT: Dr. Joe Selsky
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/17/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-080989	Ground Water	250 ml	iced ; H_2SO_4	TOC	See Attached sheets
↓	↓	1 gal	; none	Pest, Herb	for specific
		1 l	; HNO_3	T. Metals	analytical requirements.
		1 l	; H_2SO_4	Phenolics	
		1 l	; none	Wet Chem	
		1 l	; H_2SO_4	NO_2, NO_3	
		2 x 1 l	; none	Rad Chem	
		2 x 40 ml	; HCl	POX	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

00343

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117948

C/C Control No. 117296

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214405

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-020989	Well MW-2	092889; 0845	Ground Water	Amber Glass	OK 8921 9-29-89 NO cust. seals	
				" "	~~One Hamber for phenols~~	
				CPE	not rec'd 9-29-1989	
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 092889; 1625

   Received By: S. Harris ITAS 9-29-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44251

00346

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117948
C/C Control No. 117296

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. —

DATE SAMPLES SHIPPED: 09/28/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/18/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-020989	Ground Water	250 ml	iced ; H_2SO_4	TOC	See attached sheets for specific analytical requirements.
↓	↓	1 gal	; none	Pest, Herb	
		1 l	; HNO_3	T. Metals	
		1 l	; H_2SO_4	Phenolics	
		1 l	; none	Wet Chem.	
		1 l	; H_2SO_4	NO_2, NO_3	
		2 x 1 l	; none	Rad Chem	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By S Harris ITAS Date/Time 9-29-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44251

00344

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117949

C/C Control No. 117297

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214405

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-030889	Well MW-3	092889; 0900	Ground Water	Amber Glass	OK SGH 9-29-89	
				" "		
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 092889, 1626

   Received By: S. Harris ITAS 9-29-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA44251

00347

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117949
C/C Control No. 117297

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: —

DATE SAMPLES SHIPPED: 09/28/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/18/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-030989	Ground Water	250 ml	iced; H_2SO_4	TOC	See attached sheets for specific analytical requirements.
↓	↓	1 gal	; none	Pest, Herb	
		1 l	; HNO_3	T. Metals	
		1 l	; H_2SO_4	Phenolics	
		1 l	; none	Wet Chem	
		1 l	; H_2SO_4	NO_2, NO_3	
		2 x 1 l	; none	Rad Chem	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By: S. Harris ITAS Date/Time 9-29-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44251

00345

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117942

C/C Control No. 117304

PROJECT NAME/NUMBER COE-Holloman AFb/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 3792220730 433021414153

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-070989	Well MW-7	092789; 0930	Ground Water	Amber Glass	OK 8921 9-29-89	
↓	↓	↓	↓	" "	↓	
				CPE		
				Amber Glass		
				CPE		
				Amber Glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological. NOTE: Cooler received at IT Albuquerque on 9/28/89. Cooler opened & new ice added and shipped to IT AS Knoxville, TN

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 092789; 1531

   Received By: James W. Dawson, IT Corp; 9/28/89; 1.15pm

2. Relinquished By: James W. Dawson, IT Corp, 9/28/89 1.45pm

   Received By: S Harris ITAS 9-29-89 0900

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44251

00348

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117942
C/C Control No. 117304

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108

PURCHASE ORDER NO.: —

DATE SAMPLES SHIPPED: 09/27/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108

DATE REPORT REQUIRED: 10/17/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-070989	Ground Water	250 ml	iced; H_2SO_4	TOC	See Attached
↓	↓	1 gal	; none	Pest, Herb	list for specific
		1 l	; HNO_3	T. Metals	Analytical
		1 l	; H_2SO_4	Phenolics	requirement.
		1 l	; none	Wet Chem.	
		1 l	; H_2SO_4	NO_2, NO_3	
		2x1 l	; none	Rad Chem	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By S Harris ITAS Date/Time 92989 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44251

IT ANALYTICAL SERVICES
QC SAMPLE INITIATION FORM
CODING

Contract No: COE-Hollman AFB
Matrix: Water
Parameters: CLP Metals
Project Code: ITNA 44233

Original Sample: JJ6526 (MW-040989)
Matrix Spike: JJ6527
Matrix Spike Dup: JJ6528
Date Initiated: 9-27-89
Date Completed:

	Project Code	Sample ID	QC Samples
1)	ITNA 44233, 9-27-89	JJ6526	JJ6527,28
2)		JJ6529	
3)		30	
4)		31	
5)	ITNA 44238, 9-28-89	JJ6572	
6)		73	
7)		74	
8)		75	
9)	ITNA 44251, 9-29-89	JJ6711	
10)		12	
11)		13	
12)			
13)			
14)			
15)			
16)			
17)			
18)			
19)			
20)			

00350

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118491

C/C Control No. 117387

PROJECT NAME/NUMBER ITNA 4425I

LAB DESTINATION IT-RSL

SAMPLE TEAM MEMBERS

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
JJ6697	MW-020989	9-28-89	water	2x 1l malgre		
JJ6698	MW-030989	↓	↓	↓		
JJ6699	MW-070989	9-27-89				

Special Instructions: Use new interco. report format. Use both lab + client ID's on report + invoice.

Possible Sample Hazards: See attached for methods + det. limits.

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: S Harris ITAS 9-29-89 1230

Received By:

2. Relinquished By:

Received By:

3. Relinquished By:

Received by:

4. Relinquished By:

Received By:

WHITE - To accompany samples
YELLOW - Field copy

00351

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118491
C/C Control No. 117387

PROJECT NAME: ITNA 44251
PROJECT NUMBER:
PROJECT MANAGER:
BILL TO: ITAS (Middlebrook)

PURCHASE ORDER NO. 486000.04

DATE SAMPLES SHIPPED: 10-2-9-
LAB DESTINATION: IT-RSL
LABORATORY CONTACT: Jim Dillard
SEND LAB REPORT TO: ITAS (Middlebrook)

DATE REPORT REQUIRED: 10-19-89
PROJECT CONTACT: Mary Tyler
PROJECT CONTACT PHONE NO. 588-6401

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
JJ6697	water	2l		Radium, Gross α, Gross β	See CofC
JJ6698	↓	↓			
JJ6699	↓	↓			

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117938

C/C Control No. 117289

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION NM State University-Las Cruces

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. ~~Federal Express~~ Hand Delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-020989	Well MW-02	092889; 0905	Ground Water	CPE		
MW-030989	Well MW-03	092889; ~~0910~~ 0900	↓	↓		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann Houska, IT Corp; 092889; 1000

   Received By: David Ayers, IT Corp 092889; 1005

2. Relinquished By: [illegible]

   Received By: [illegible]

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117938
C/C Control No. 117289

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.:

DATE SAMPLES SHIPPED: 09/28/89
LAB DESTINATION: NM State Univ.-Las Cruces
LABORATORY CONTACT: Andy Bristol
SEND LAB REPORT TO: International Technology
5301 Central Ave NE ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/18/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-020989	Ground Water	120 ml	iced	Coloform Bacteria	See attached sheet
MW-030989	↓	↓	↓	↓	for specific
					analytical
					requirements.

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By [illegible] Date/Time [illegible]

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117954

C/C Control No. 105504

PROJECT NAME/NUMBER COE - Holloman AFB/301251.02

LAB DESTINATION ITAS - AUSTIN

SAMPLE TEAM MEMBERS A. Houska; J. Boyd

CARRIER/WAYBILL NO. Federal Express 4330213650

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
DWK * MW-010989A	MW-1	100489; 1630	Ground Water	Amber Glass, Septa Cap	Good ice 10/6/89 DWK	
MW-020989A	MW-2	100489; 1750				
MW-030989A	MW-3	100489; 1730			*-Did not receive DWK	
MW-040989A	MW-4	100489; 1125			~~MW-060989A~~	
MW-050989A	MW-5	100589; 0810				
DWK * MW-060989A	MW-6	100489; 1400				
MW-070989A	MW-7	100589; 0820				
MW-080989A	MW-8	100589; 1000				
MW-110989A	MW-11	100489; 0525				
MW-120989A	MW-12	100489; 1700				

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp, 100589, 1550

   Received By: Dorfas W. Keene ITAS 10/6/89 0950

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117954
C/C Control No. 105504

PROJECT NAME: COE - Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: IT Corp
5301 Central Ave, NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.:

DATE SAMPLES SHIPPED: 10/05/89
LAB DESTINATION: ITAS - Austin
LABORATORY CONTACT: Tony Spinelli
SEND LAB REPORT TO: IT Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/25/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-010989A	Ground Water	250 ml	iced; H_2SO_4	POX x 4	See attached
MW-020989A	↓	↓	↓	POX	sheets for
MW-030989A				↓	specific analytical
MW-040989A					requirements.
MW-050989A					
MW-060989A					
MW-070989A					
MW-080989A					
MW-110989A					
MW-120989A	↓	↓	↓	↓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By [signature] ITAS Date/Time 10/6/89 0950

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117963

C/C Control No. 117282

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Austin

SAMPLE TEAM MEMBERS A. Houska, ~~M. Lyon~~ J. Boyd

CARRIER/WAYBILL NO. Federal Express 4330213650

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S-020989A	S-2	100489; 1515	Ground Water	Amber Glass,	septa cap	
S-040989A	S-4	100489; 1215	↓	↓	↓	
					Good rec DWK 10/6/89	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, ITCorp, 100589, 1550

   Received By: [signature] Keene ITAS 10/6/89 0950

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117963
C/C Control No. 117282

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: —

~~* Bid No. AJS89137~~

DATE SAMPLES SHIPPED: ~~09~~ 10/05/89
LAB DESTINATION: ITAS-Austin
LABORATORY CONTACT: Tony Spinelli
SEND LAB REPORT TO: International Technology
5301Central Ave NE, Ste700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 10/25/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-028~~0989A~~	Ground Water	250 ml	iced; H_2SO_4	POX x 4	See attached sheets
S-040989A	↓	↓	↓ ; ↓	POX	for specific
					analytical require-
					ments.

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By Douglas W. Keene ITAS Date/Time 10/6/89 0950

WHITE - Original, to accompany samples
YELLOW - Field copy

5

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117966

C/C Control No. 117307

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION USACE-Missouri River Division

SAMPLE TEAM MEMBERS A. Houska, ~~H. Lyon~~ J. Boyd

CARRIER/WAYBILL NO. Federal Express 4330214523

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-010989A	MW-1	100489; 1630	Ground Water	Amber glass/septa cap		
QMW-080989A	MW-8	100589; 1000	↓	↓	↓	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Anna M Houska, IT Corp, 100589, 1545

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117966
C/C Control No. 117307

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. —

DATE SAMPLES SHIPPED: ~~09/~~ 10/05/89
LAB DESTINATION: ~~USACE-Missouri River Div.~~ La
LABORATORY CONTACT: ~~Dr. Joe Solsky~~
SEND LAB REPORT TO: ~~International Technology~~
~~5301 Central Ave NE Ste~~ 700
~~Albuquerque, NM 87108~~
DATE REPORT REQUIRED: 10/25/89
PROJECT CONTACT: ~~Dann Mayer~~
PROJECT CONTACT PHONE NO. ~~(505)262-8300~~

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-010989A	Ground Water	250 ml	iced; H_2SO_4	POX	See attached
QMW-020989A	↓	↓	↓; ↓	POX	sheets for specific
					analytical requirements

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

APPENDIX D

CERTIFICATES OF ANALYSES

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

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CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

November 3, 1989

Job Number: ITNA 44233 Corrected Certificate

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/27/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 09/27/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography/electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150, respectively.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection based on SW-846 method 9060.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

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CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

October 18, 1989

Job Number: ITNA 44233

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/27/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 09/27/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography/electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150, respectively.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection using EPA method 415.1.

Reviewed and Approved:

Mary Tyler
Laboratory Project Manager

II. Analytical Results/Methodology (continued)

Th samples were analyzed for phenols by colorimetric determination using EPA SW-846 method 9065.

The samples were analyzed for nitrate and nitrite by colorimetric determination using EPA method 353.3.

The samples were analyzed for requested anions by ion chromatography using EPA method 300.0.

The samples were analyzed for fluoride by potentiometric determination using EPA method 340.2.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were extracted for pesticides and herbicides on 09/29/89. The samples were analyzed on 10/03/89 and 10/05/89. The pesticide extracts were treated for sulfur interference prior to analysis using SW-846 method 3660. No problems were encountered.

The samples were analyzed for total organic carbon (TOC) on 10/03/89. No problems were encountered. Sample S-020989 was analyzed four times and results for each analysis are reported.

The phenol analyses were performed on 10/10/89. No problems were encountered.

The nitrate and nitrite analyses were performed on 10/12/89. No problems were encountered.

The anion analyses were performed on 10/11/89. No problems were encountered.

The fluoride determination was performed on 10/13/89. No problems were encountered.

International Technology
October 18, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44233

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	Method Blank
Lab Sample ID:	BL4845/4867
Lindane	0.1 U
Endrin	0.1 U
Methoxychlor	0.1 U
Toxaphene	0.5 U
2,4-D	1.2 U
Silvex	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 09/29/89
Date Analyzed: (Pesticides) 10/03/89
(Herbicides) 10/05/89

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International Technology
October 19, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44233

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	MW-040989	MW-060989	S-020898	S-040989
Lab Sample ID:	JJ6532	JJ6533	JJ6534	JJ6535
Lindane	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 09/29/89
Date Analyzed: (Pesticides) 10/03/89
(Herbicides) 10/05/89

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International Technology
October 18, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44233

TOTAL ORGANIC CARBON ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
MW-040989	JJ6510	13
MW-060989	JJ6511	5
S-020989 D1	JJ6512	6
S-020989 D2	JJ6512	6
S-020989 D3	JJ6512	5
S-020989 D4	JJ6512	5
S-040989	JJ6513	1
Method Blank	D0216	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 10/03/89

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International Technology
October 18, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44233

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	Method Blank -	MW-040989 JJ6514/JJ6518/JJ6522	Analysis Date
Phenols	0.01 U	0.01 U	10/10/89
Nitrate, as N	0.05 U	0.08	10/12/89
Nitrite, as N	0.01 U	0.01 U	10/12/89
Chloride	0.5 U	3,300	10/11/89
Fluoride	0.1 U	0.9	10/13/89
Sulfate	1.5 U	4,100	10/11/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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International Technology
October 18, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44233

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	MW-060989	S-020989	Analysis
Lab Sample ID:	JJ6515/JJ6519/JJ6523	JJ6516/JJ6520/JJ6524	Date
Phenols	0.01 U	0.01 U	10/10/89
Nitrate, as N	2.5	2.7	10/12/89
Nitrite, as N	0.18	0.03	10/12/89
Chloride	44,000	1,600	10/11/89
Fluoride	0.9	3.4	10/13/89
Sulfate	5,200	3,900	10/11/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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International Technology
October 18, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44233

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	S-040989	Analysis
Lab Sample ID:	JJ6517/JJ6521/JJ6525	Date
Phenols	0.01 U	10/10/89
Nitrate, as N	26	10/12/89
Nitrite, as N	0.01 U	10/12/89
Chloride	14,000	10/11/89
Fluoride	1.0	10/13/89
Sulfate	4,100	10/11/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

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IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

October 31, 1989

Job Number: ITNA 44233

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/27/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 09/27/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that CLP data are not blank corrected.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

III. Quality Control

The samples were digested on 10/02/89 for ICP and 10/02/89 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 10/10/89; the GFAA analyses for arsenic, lead, and selenium were

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

III. Quality Control (continued)

performed on 10/05-12/89; the remaining metals were analyzed by ICP on 10/05/89. All run QC was acceptable. A duplicate/spike pair was prepared using sample MW-040989. Spike recovery (accuracy) results were within control limits for all elements except selenium and silver. A post digest spike was performed on selenium and results were within control limits. A post digest spike is not required for silver. Duplicate RPD (precision) results were within control limits for all parameters.

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5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

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Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply
X - Detection limits higher than normal due to sample matrix interferences.

U.S. EPA - CLP

~~00010~~

00001

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-HOLMAN AFB MW-040989

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~

SOW No.: 7/87

EPA Sample No.		Lab Sample ID.
MW-040989	WELL # MW-4	JJ6526
MW 040989	WELL # MW-6	JJ6529
S 020989	WELL # S-2	JJ6530
S 040989	WELL # S-4	JJ6531
MW040989D		JJ6527-D
MW040989S		JJ6528-S

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager: _____

Date: _____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-040989

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Matrix (soil/water): WATER Lab Sample ID: JJ6526____

Level (low/med): _____ Date Received: 09/27/89

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	6.0	B		F
7440-39-3	Barium___	22.0	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__	5.0	U		P
7440-70-2	Calcium__				NR
7440-47-3	Chromium_	10	U		P
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____	325			P
7439-92-1	Lead_____	7.0			F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	483		E	P
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_	7.0	U	N	F
7440-22-4	Silver___	5.0	U	N	P
7440-23-5	Sodium___	1560000		E	P
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ___

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW 060989

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Matrix (soil/water): WATER Lab Sample ID: JJ6529____

Level (low/med): _____ Date Received: 09/27/89

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	7.0	B		F
7440-39-3	Barium___	50.0	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__	5.0	U		P
7440-70-2	Calcium__				NR
7440-47-3	Chromium_	15.0			P
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____	924			P
7439-92-1	Lead_____	88.0			F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	610		E	P
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_	37.0	U	N	F
7440-22-4	Silver___	5.0	U	N	P
7440-23-5	Sodium___	16700000		E	P
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ___

Comments:

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

S020989

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6525~~ MW-040989

Matrix (soil/water): WATER Lab Sample ID: JJ6530____

Level (low/med): _____ Date Received: 09/27/89

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	8.0_	B		F_
7440-39-3	Barium___	16.0_	B		P_
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__	5.0_	U		P_
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_	10_	U		P_
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____	495_	_		P_
7439-92-1	Lead_____	28.0_	U		F_
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese	144_	_	E	P_
7439-97-6	Mercury__	0.20_	U		CV
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_	8.0_	U	N	F_
7440-22-4	Silver___	5.0_	U	N	P_
7440-23-5	Sodium___	1430000_	_	E	P_
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc_____		_		NR
_____	Cyanide__		_		NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ___

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

S 040989

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Matrix (soil/water): WATER Lab Sample ID: JJ6531____

Level (low/med): _____ Date Received: 09/27/89

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__	6.0	B		F
7440-39-3	Barium___	26.0	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__	5.0	U		P
7440-70-2	Calcium__				NR
7440-47-3	Chromium_	10	U		P
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____	440			P
7439-92-1	Lead_____	61.1		S	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	10	B	E	P
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_	36.0	U	N	F
7440-22-4	Silver___	5.0	U	N	P
7440-23-5	Sodium___	10300000		E	P
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
	Cyanide__				NR

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ___

Comments:

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40000.0	41479.67	103.7	40000.0	41719.10	104.3	41367.59	103.4	P
Antimony	4000.0	4197.69	104.9	4000.0	4267.92	106.7	4197.65	104.9	P
Arsenic	4000.0	3778.63	94.5	4000.0	3918.97	98.0	4019.41	100.5	P
Barium	4000.0	3925.93	98.1	4000.0	3952.76	98.8	3960.58	99.0	P
Beryllium	4000.0	4036.99	100.9	4000.0	4139.17	103.5	4025.64	100.6	P
Cadmium	4000.0	3773.59	94.3	4000.0	3920.31	98.0	4009.88	100.2	P
Calcium	40000.0	42595.85	106.5	40000.0	43497.02	108.7	42434.08	106.1	P
Chromium	4000.0	3965.11	99.1	4000.0	4053.75	101.3	4111.61	102.8	P
Cobalt	4000.0	3908.05	97.7	4000.0	4064.18	101.6	4152.57	103.8	P
Copper	4000.0	3806.23	95.2	4000.0	3809.47	95.2	3855.50	96.4	P
Iron	40000.0	42739.64	106.8	40000.0	43516.40	108.8	42623.73	106.6	P
Lead	4000.0	3627.62	90.7	4000.0	3725.83	93.1	3791.66	94.8	P
Magnesium	40000.0	41900.73	104.8	40000.0	41937.54	104.8	41809.53	104.5	P
Manganese	4000.0	3960.13	99.0	4000.0	4088.58	102.2	4179.50	104.5	P
Mercury	4.0	3.20	80.0	4.0	3.20	80.0	3.80	95.0	CV
Nickel	4000.0	4028.73	100.7	4000.0	4140.26	103.5	4243.15	106.1	P
Potassium	40000.0	40388.31	101.0	40000.0	40259.94	100.6	40436.98	101.1	P
Selenium	4000.0	3772.00	94.3	4000.0	3890.51	97.3	3984.19	99.6	P
Silver	4000.0	4145.72	103.6	4000.0	4293.98	107.3	4288.29	107.2	P
Sodium	40000.0	40837.32	102.1	40000.0	40762.70	101.9	40751.91	101.9	P
Thallium	4000.0	4366.06	109.2	4000.0	4322.07	108.1	4381.25	109.5	P
Vanadium	4000.0	3744.88	93.6	4000.0	3792.17	94.8	3895.70	97.4	P
Zinc	4000.0	3926.66	98.2	4000.0	4009.38	100.2	4077.77	101.9	P
Cyanide									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	41077.28	102.7	40947.97	102.4	P
Antimony				4000.0	4213.90	105.3	4126.49	103.2	P
Arsenic				4000.0	4036.17	100.9	3939.87	98.5	P
Barium				4000.0	3888.20	97.2	3918.74	98.0	P
Beryllium				4000.0	4000.94	100.0	3993.53	99.8	P
Cadmium				4000.0	4026.71	100.7	3909.35	97.7	P
Calcium				40000.0	43185.86	108.0	41822.22	104.6	P
Chromium				4000.0	4064.24	101.6	4064.24	101.6	P
Cobalt				4000.0	4154.01	103.9	4071.86	101.8	P
Copper				4000.0	3813.92	95.3	3792.70	94.8	P
Iron				40000.0	42698.39	106.7	42132.64	105.3	P
Lead				4000.0	3810.22	95.3	3707.80	92.7	P
Magnesium				40000.0	41641.54	104.1	41500.47	103.8	P
Manganese				4000.0	4179.90	104.5	4086.71	102.2	P
Mercury				4.0	3.80	95.0			CV
Nickel				4000.0	4212.28	105.3	4120.65	103.0	P
Potassium				40000.0	40525.35	101.3	39642.33	99.1	P
Selenium				4000.0	3947.60	98.7	3980.35	99.5	P
Silver				4000.0	4245.90	106.1	3927.36	98.2	P
Sodium				40000.0	40179.44	100.4	409553.5	1023	P
Thallium				4000.0	4334.01	108.4	4086.71	102.2	P
Vanadium				4000.0	3871.91	96.8	4120.65	103.0	P
Zinc				4000.0	4159.92	104.0	4023.34	100.6	P
Cyanide									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~II6524~~ MN-040989

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	40966.02	102.4			P
Antimony				4000.0	4186.91	104.7			P
Arsenic				4000.0	4101.31	102.5			P
Barium				4000.0	3891.93	97.3			P
Beryllium				4000.0	4014.74	100.4			P
Cadmium				4000.0	3984.63	99.6			P
Calcium				40000.0	42685.50	106.7			P
Chromium				4000.0	4132.80	103.3			P
Cobalt				4000.0	4132.39	103.3			P
Copper				4000.0	3823.27	95.6			P
Iron				40000.0	42608.49	106.5			P
Lead				4000.0	3783.04	94.6			P
Magnesium				40000.0	41512.32	103.8			P
Manganese				4000.0	4151.10	103.8			P
Mercury									NR
Nickel				4000.0	4218.99	105.5			P
Potassium				40000.0	40022.65	100.1			P
Selenium				4000.0	3947.60	98.7			P
Silver				4000.0	4266.31	106.7			P
Sodium				40000.0	40453.01	101.1			P
Thallium				4000.0	4199.29	105.0			P
Vanadium				4000.0	4603.09	115.1			P
Zinc				4000.0	4078.80	102.0			P
Cyanide									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic	50.0	48.00	96.0	50.0	48.00	96.0	52.00	104.0	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	50.0	47.00	94.0	50.0	47.00	94.0	49.00	98.0	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium	50.0	49.00	98.0	50.0	46.00	92.0	46 ~~50.00~~	~~100.0~~ 92.0	F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JI6524~~ MW-040989

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	51.00	102.0	52.0	104.0	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	47.00	94.0	52.00	104.0	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium				50.0	48.0	96.0			NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6525~~ MW-040989

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	54.00	108.0	54.00	108.0	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hillman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~J36526~~ MN-04098

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium	50.0	55.00	110.0	50.0	49.00	98.0	50.00	100.0	F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00013

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~IJ6526~~ MW-04098

AA CRDL Standard Source: NBS_____

ICP CRDL Standard Source: NBS_____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony				120.0	129.83	108.2	131.12	109.3
Arsenic	20.0	16.00	80.0	60.0	40.39	67.3	70.53	117.6
Barium								
Beryllium				10.0	11.10	111.0	10.43	104.3
Cadmium				10.0	12.35	123.5	12.35	123.5
Calcium								
Chromium				20.0	22.05	110.2	24.67	123.4
Cobalt				100.0	105.20	105.2	103.76	103.8
Copper				50.0	48.19	96.4	48.19	96.4
Iron								
Lead	10.0	13.00	130.0	60.0	65.75	109.6	64.78	108.0
Magnesium								
Manganese				30.0	28.47	94.9	28.15	93.8
Mercury	0.4	0.40	100.0					
Nickel				80.0	85.64	107.0	79.63	99.5
Potassium								
Selenium	10.0	10.00	100.0	120.0	129.86	108.2	92.59	77.2
Silver				20.0	10.44	52.2	9.49	47.4
Sodium								
Thallium				60.0	82.30	137.2	92.25	153.8
Vanadium				100.0	102.21	102.2	98.42	98.4
Zinc				40.0	63.09	157.7	61.47	153.7

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_KNOXVILLE_____ Contract: COE- Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

AA CRDL Standard Source: NBS_____

ICP CRDL Standard Source: NBS_____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium	10.0	10.00	100.0					
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	PBW C0697 Prepa-ration Blank	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	P
Antimony	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Arsenic	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Calcium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Cobalt	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	10.5	B	P
Lead	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U			CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1000.0	U	P
Selenium	60.0	U	60.0	U	60.0	U	60.0	U	60.0	U	P
Silver	5.0	U	5.0	U	5.0	U	5.0	U	5.0 ~~11.9~~	U	P
Sodium	200.0	U	200.0	U	200.0	U	200.0	U	200.0	U	P
Thallium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	15.9	B	P
Cyanide											NR

U.S. EPA - CLP

00016

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~UJ6326~~ MW-04098

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			40.0	U	40.0	U					P
Antimony			30.0	U	30.0	U					P
Arsenic			30.0	U	30.0	U					P
Barium			2.0	U	2.0	U					P
Beryllium			1.0	U	1.0	U					P
Cadmium			5.0	U	5.0	U					P
Calcium			30.0	U	30.0	U					P
Chromium			10.0	U	10.0	U					P
Cobalt			20.0	U	20.0	U					P
Copper			10.0	U	10.0	U					P
Iron			10.0	U	10.0	U					P
Lead			30.0	U	30.0	U					P
Magnesium			30.0	U	30.0	U					P
Manganese			2.0	U	2.0	U					P
Mercury			~~0.2~~	U							CV
Nickel			20.0	U	20.0	U					P
Potassium			1000.0	U	1000.0	U					P
Selenium			60.0	U	60.0	U					P
Silver			5.0	U	5.0	U					P
Sodium			200.0	U	200.0	U					P
Thallium			30.0	U	30.0	U					P
Vanadium			10.0	U	10.0	U					P
Zinc			5.0	U	5.0	U					P
Cyanide											NR

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: CDE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			40.0	U							P
Antimony			30.0	U							P
Arsenic			30.0	U							P
Barium			2.0	U							P
Beryllium			1.0	U							P
Cadmium			5.0	U							P
Calcium			30.0	U							P
Chromium			10.0	U							P
Cobalt			20.0	U							P
Copper			10.0	U							P
Iron			10.0	U							P
Lead			30.0	U							P
Magnesium			30.0	U							P
Manganese			2.0	U							P
Mercury											NR
Nickel			20.0	U							P
Potassium			1000.0	U							P
Selenium			60.0	U							P
Silver			5.0	U							P
Sodium			200.0	U							P
Thallium			30.0	U							P
Vanadium			10.0	U							P
Zinc			5.0	U							P
Cyanide											NR

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-04098

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic			2.0	U							NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U	2.0	U			F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium	2.0	U	2.0	U	2.0	U					F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Cyanide											NR

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No: _____ SDG No.: ~~JJ6526~~ MW-040989

ICP ID Number: JA1100_____ ICS Source: SPEX_____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	500000	485000	502185	502985.2	103.7	494800	494400.0	101.9
Antimony								
Arsenic								
Barium		471		458.2	97.3		455.4	96.7
Beryllium		520		507.1	97.5		494.1	95.0
Cadmium		990		866.0	87.5		874.1	88.3
Calcium	500000	509000	502497	508590.7	99.9	495900	496000.0	97.4
Chromium		452		441.0	97.6		447.8	99.1
Cobalt		459		447.7	97.5		452.5	98.6
Copper		441		440.2	99.8		435.2	98.7
Iron	200000	188000	184013	189563.5	100.8	181400	185700.0	98.8
Lead		1010		1097.0	108.6		1109.0	109.8
Magnesium	500000	495000	500068	494089.0	99.8	495900	488700.0	98.7
Manganese		451		385.3	85.4		389.9	86.5
Mercury								
Nickel		8630		873.5	10.1		865.0	10.0
Potassium								
Selenium								
Silver		909		910.2	100.1		899.6	99.0
Sodium								
Thallium								
Vanadium		467		441.8	94.6		442.9	94.8
Zinc		920		906.2	98.5		923.3	100.4

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5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

S

Lab Name: ITAS_KNOXVILLE Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic	75-125	43.0000		6.0000	B	40.0	92.5		F
Barium	75-125	1644.0000		22.0000	B	2000.0	81.1		P
Beryllium									NR
Cadmium	75-125	47.0000		5.0000	U	50.0	94.0		P
Calcium									NR
Chromium	75-125	156.0000		10.0000	U	200.0	78.0		P
Cobalt									NR
Copper									NR
Iron	75-125	1187.0000		325.0000		1000.0	86.2		P
Lead	75-125	23.0000		7.0000		20.0	80.0		F
Magnesium									NR
Manganese	75-125	866.0000		483.0000		500.0	76.6		P
Mercury	75-125	1.0000		0.2000	U	1.0	100.0		CV
Nickel									NR
Potassium									NR
Selenium	75-125	7.0000		7.0000	U	10.0	70.0	N	F
Silver	75-125	30.0000		5.0000	U	50.0	60.0	N	P
Sodium		200.0000	U	1560000.0000					NR
Thallium									NR
Vanadium									NR
Zinc									NR
Cyanide									NR

Comments:

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6
DUPLICATES

EPA SAMPLE NO.

D

Lab Name: ITAS_KNOXVILLE Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

Matrix (soil/water): WATER Level (low/med): _____

% Solids for Sample: 0 % Solids for Duplicate: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic	841824	6.0000	B	8.0000	B	28.6		F
Barium	858601	22.0000	B	22.0000	B	0.0		P
Beryllium								NR
Cadmium	959263	5.0000	U	5.0000	U			P
Calcium								NR
Chromium	858601	10.0000	U	10.0000	U			P
Cobalt								NR
Copper								NR
Iron	908933	325.0000		357.0000		9.4		P
Lead	825045	7.0000		6.0000		15.4		F
Magnesium								NR
Manganese	892155	483.0000		504.0000		4.3		P
Mercury	908932	0.2000	U	0.2000	U			CV
Nickel								NR
Potassium								NR
Selenium	841824	7.0000	U	7.0000	U			F
Silver	875377	5.0000	U	5.0000	U			P
Sodium	892154	1560000.0000		1700000.0000		8.6		P
Thallium								NR
Vanadium								NR
Zinc								NR
Cyanide								NR

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7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JI6526~~ MW-040989

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

LCSW C0710

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	20000.0	20740.00	103.7						
Antimony	4000.0	4115.00	102.9						
Arsenic	4000.0	4127.00	103.2						
Barium	4000.0	4039.00	101.0						
Beryllium	4000.0	4525.00	113.1						
Cadmium	4000.0	4016.00	100.4						
Calcium	20000.0	21490.00	107.4						
Chromium	4000.0	4045.00	101.1						
Cobalt	4000.0	4088.00	102.2						
Copper	4000.0	3907.00	97.7						
Iron	20000.0	21670.00	108.4						
Lead	4000.0	3782.00	94.6						
Magnesium	20000.0	21090.00	105.4						
Manganese	4000.0	3785.00	94.6						
Mercury									
Nickel	4000.0	3978.00	99.4						
Potassium	20000.0	19320.04	96.6						
Selenium	4000.0	4059.00	101.5						
Silver	4000.0	3987.00	99.7						
Sodium	20000.0	20350.00	101.8						
Thallium	4000.0	4231.00	105.8						
Vanadium	4000.0	3906.00	97.6						
Zinc	4000.0	4072.00	101.8						
Cyanide									

7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6525~~ MN-040989

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic	40.0	47.00	117.5						
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20.0	19.00	95.0						
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium	20.0	23.00	115.0						
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

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9
ICP SERIAL DILUTION

EPA SAMPLE NO.

L

Lab Name: ITAS_KNOXVILLE Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6525~~ MW-040989

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							F
Antimony							F
Arsenic							F
Barium	22.00	B	26.00	B	18.2		P
Beryllium							F
Cadmium	5.00	U	25.00	U			NR
Calcium							F
Chromium	10.00	U	50.00	U			NR
Cobalt							F
Copper							F
Iron	325.00		424.00	B	30.5		P
Lead							F
Magnesium							F
Manganese	483.00		542.00		12.2	E	P
Mercury							
Nickel							F
Potassium							F
Selenium							F
Silver	5.00	U	25.00	U			NR
Sodium	1560000.00		2158000.00		38.3	E	P
Thallium							CV
Vanadium							F
Zinc							F

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10
HOLDING TIMES

Lab Name: ITAS-KNOXVILLE Contract: COE-Hollman AFB

Lab Code: IT-STU Case No.: 44233 SAS No.: _____ SDG No.: MW-040989

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
MW-040989	Water	09/27/89	10/10/89	13 days		
MW-060989	Water	09/27/89	10/10/89	13 days		
S 020989	Water	09/27/89	10/10/89	13 days		
S 040989	Water	09/27/89	10/10/89	13 days		

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11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MN-04098

ICP ID Number: JA1100_____ Date: 07/01/89

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

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00028

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE- Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

ICP ID Number: _____ Date: 07/01/89

Flame AA ID Number : _____

Furnace AA ID Number : 5100/600____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	196.00		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.0	F
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

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00029

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6525~~ MW-040989

ICP ID Number: _____ Date: 07/01/89

Flame AA ID Number : _____

Furnace AA ID Number : 12E/188_____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	217.00		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

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00030

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6525~~ MW-040989

ICP ID Number: _____ Date: 07/01/89

Flame AA ID Number : 151_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

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12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

ICP ID Number: JA1100_____ Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	AS
Aluminum	308.20					
Antimony	206.80					
Arsenic	193.60	0.0103600		0.0013600		
Barium	493.40					
Beryllium	313.00					
Cadmium	228.80					
Calcium	317.90					0.0055600
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30	0.0006800				
Magnesium	279.00					
Manganese	257.60					
Mercury						
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0103900		
Vanadium	292.40					
Zinc	213.80					

Comments:

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12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

ICP ID Number: JA1100_____ Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : BA	BE	CO	CR	NI
Aluminum	308.20					
Antimony	206.80				0.0055800	
Arsenic	193.60	0.0006600		0.0005200		
Barium	493.40					
Beryllium	313.00				0.0002800	0.0001200
Cadmium	228.80		0.0025800			
Calcium	317.90					
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30					
Magnesium	279.00					
Manganese	257.60					
Mercury						
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0018300		
Vanadium	292.40					
Zinc	213.80					0.0032600

Comments:

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00033

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MW-040989

ICP ID Number: JA1100_____ Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : V_	__	__	__	__
Aluminum	308.20	0.0218400				
Antimony	206.80					
Arsenic	193.60	0.0128200				
Barium	493.40					
Beryllium	313.00	0.0062300				
Cadmium	228.80					
Calcium	317.90					
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30					
Magnesium	279.00					
Manganese	257.60					
Mercury						
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80	0.0019670				
Vanadium	292.40					
Zinc	213.80					0.0000000

Comments:

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13

ICP LINEAR RANGES (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Hollman AFB

Lab Code: ITSTU_ Case No.: 44233 SAS No.: _____ SDG No.: ~~JJ6526~~ MN-040989

ICP ID Number: JA1100_____ Date: 07/01/89

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	
Antimony	6.00	15000.0	
Arsenic	6.00	15000.0	
Barium	6.00	15000.0	
Beryllium	6.00	15000.0	
Cadmium	6.00	15000.0	
Calcium	6.00	500000.0	
Chromium	6.00	15000.0	
Cobalt	6.00	15000.0	
Copper	6.00	40000.0	
Iron	6.00	500000.0	
Lead	6.00	40000.0	
Magnesium	6.00	500000.0	
Manganese	6.00	40000.0	
Mercury			NR
Nickel	6.00	15000.0	
Potassium	6.00	500000.0	
Selenium	6.00	15000.0	
Silver	6.00	15000.0	
Sodium	6.00	500000.0	
Thallium	6.00	15000.0	
Vanadium	6.00	12000.0	
Zinc	6.00	40000.0	

Comments:

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

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IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

November 3, 1989

Job Number: ITNA 44238 Corrected Certificate

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/28/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 09/28/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection based on SW-846 method 9060.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

October 19, 1989

RECEIVED
OCT 23 1989
IT CORP.-ALBUQUERQUE

Job Number: ITNA 44238

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/28/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 09/28/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection using EPA method 415.1.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

II. Analytical Results/Methodology (continued)

Th samples were analyzed for phenols by colorimetric determination using EPA SW-846 method 9065.

The samples were analyzed for nitrate and nitrite by colorimetric determination using EPA method 353.3.

The samples were analyzed for requested anions by ion chromatography using EPA method 300.0.

The samples were analyzed for fluoride by potentiometric determination using EPA method 340.2.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were extracted for pesticides and herbicides on 09/29/89. The samples were analyzed on 10/03/89 and 10/05/89. No problems were encountered. The pesticide extracts were treated for sulfur interference prior to analysis using SW-846 method 3660.

The samples were analyzed for total organic carbon (TOC) on 10/03/89. No problems were encountered. Sample MW-010989 was analyzed four times and results for each analysis are reported.

The phenol analyses were performed on 10/10/89. No problems were encountered.

The nitrate and nitrite analyses were performed on 10/12/89. No problems were encountered.

The anion analyses were performed on 10/11/89. No problems were encountered.

The fluoride determination was performed on 10/13/89. No problems were encountered.

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	Method Blank
Lab Sample ID:	BL4862/4867
Lindane	0.1 U
Endrin	0.1 U
Methoxychlor	0.1 U
Toxaphene	0.5 U
2,4-D	1.2 U
Silvex	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 09/29/89
Date Analyzed: (Pesticides) 10/03/89
(Herbicides) 10/05/89

International Technology
October 19, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44238

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	MW-010989	MW-050989	MW-080989	MW-120989
Lab Sample ID:	JJ6576	JJ6577	JJ6578	JJ6579
Lindane	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 09/29/89
Date Analyzed: (Pesticides) 10/03/89
(Herbicides) 10/05/89

International Technology
October 19, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44238

TOTAL ORGANIC CARBON ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
MW-010989 D1	JJ6556	1
MW-010989 D2	JJ6556	1 U
MW-010989 D3	JJ6556	1 U
MW-010989 D4	JJ6556	1 U
MW-050989	JJ6557	7
MW-080989	JJ6558	5
MW-120989	JJ6559	2
Method Blank	D0216	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 10/03/89

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October 19, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44238

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	Method Blank -	MW-010989 JJ6560/JJ6564/JJ6568	Analysis Date
Phenols	0.01 U	0.01 U	10/10/89
Nitrate, as N	0.05 U	2.8	10/12/89
Nitrite, as N	0.01 U	0.01 U	10/12/89
Chloride	0.5 U	16,000	10/11/89
Sulfate	1.5 U	2,100	10/11/89
Fluoride	0.1 U	1.3	10/13/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
October 19, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44238

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	MW-050989 JJ6561/JJ6565/JJ6569	MW-080989 JJ6562/JJ6566/JJ6570	Analysis Date
Phenols	0.01 U	0.01 U	10/10/89
Nitrate, as N	0.12	0.13	10/12/89
Nitrite, as N	0.01 U	0.01 U	10/12/89
Chloride	1,800	3,500	10/11/89
Sulfate	1,800	3,600	10/11/89
Fluoride	2.1	0.7	10/13/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
October 19, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44238

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	MW-120989	Analysis
Lab Sample ID:	JJ6563/JJ6567/JJ6571	Date
Phenols	0.01 U	10/10/89
Nitrate, as N	3.0	10/12/89
Nitrite, as N	0.01 U	10/12/89
Chloride	25,000	10/11/89
Sulfate	2,300	10/11/89
Fluoride	1.3	10/13/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

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NOV 08 1989

CERTIFICATE OF ANALYSIS IT CORP.-ALBUQUERQUE

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

October 31, 1989

Job Number: ITNA 44238

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/28/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 09/28/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that CLP data are not blank corrected.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

III. Quality Control

The samples were digested on 10/06/89 for ICP and 10/06/89 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 10/10/89; the GFAA analyses for arsenic, lead and selenium, were performed on 10/13-20/89; the remaining metals were analyzed by ICP on 10/12/89. All run QC was acceptable. Associated QC samples were analyzed with ITAS project ITNA 44233, sample MW-040989.

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

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IT CORP.-ALBUQUERQUE

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply
X - Detection limits higher than normal due to sample matrix interferences.

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

SOW No.: 7/87_

EPA Sample No.	Lab Sample ID.
_MW-010989____	JJ6572_____
_MW-050989____	JJ6573_____
_MW-080989____	JJ6574_____
_MW-120989____	JJ6575_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager: _____

Date: _____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-010989

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44238 SAS No.: SDG No.: MW-010989

Matrix (soil/water): WATER Lab Sample ID: JJ6572

Level (low/med): Date Received: 09/28/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	7.0	B	W	F
7440-39-3	Barium	53.7	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	701		E	P
7439-92-1	Lead	20.0	U		F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	61.0			P
7439-97-6	Mercury	0.60			CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	60.0	U		P
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	6270000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Boron				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: OLORLESS Clarity After: CLEAR Artifacts:

Comments:
REPORTED ICAP VALUE FOR SELENIUM INSTEAD FOR GFAA, DUE TO MATRIX INTERFERENCE THE ICAP DETECTION LIMIT IS LOWER.

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-050989

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44238 SAS No.: SDG No.: MW-010989

Matrix (soil/water): WATER Lab Sample ID: JJ6573

Level (low/med): Date Received: 09/28/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	16.0		W	F
7440-39-3	Barium	31.2	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	725		E	P
7439-92-1	Lead	4.0	U	W	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	2080			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	27.0	U	W	F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	1420000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Boron				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-080989

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44238 SAS No.: SDG No.: MW-010989

Matrix (soil/water): WATER Lab Sample ID: JJ6574

Level (low/med): Date Received: 09/28/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	12.0	U	W	F
7440-39-3	Barium	16.9	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	17.6			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	270		E	P
7439-92-1	Lead	4.0	U	W	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	553			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	27.0	U	W	F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	1740000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Boron				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-120989

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44238 SAS No.: SDG No.: MW-010989

Matrix (soil/water): WATER Lab Sample ID: JJ6575

Level (low/med): Date Received: 09/28/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	7.0	B		F
7440-39-3	Barium	51.1	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	718		E	P
7439-92-1	Lead	30.0	U		F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	64.6			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	51.0	U		F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	7820000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Boron				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40000.0	41189.3	103.0	40000.0	42759.10	106.9	42628.93	106.6	P
Antimony	4000.0	4012.24	100.3	4000.0	4124.87	103.1	4198.48	105.0	P
Arsenic	4000.0	3719.12	93.0	4000.0	3841.44	96.0	3894.65	97.4	P
Barium	4000.0	3819.94	95.5	4000.0	4014.62	100.4	3976.78	99.4	P
Beryllium	4000.0	3984.99	99.6	4000.0	4204.53	105.1	4180.41	104.5	P
Cadmium	4000.0	4049.17	101.2	4000.0	4140.03	103.5	4153.97	103.8	P
Calcium	40000.0	41790.6	104.5	40000.0	43382.79	108.5	43243.56	108.1	P
Chromium	4000.0	3713.57	92.8	4000.0	3884.80	97.1	3879.22	97.0	P
Cobalt	4000.0	4133.36	103.3	4000.0	4240.76	106.0	4250.50	106.3	P
Copper	4000.0	3978.64	99.5	4000.0	4059.08	101.5	4057.84	101.4	P
Iron	40000.0	41107.0	102.8	40000.0	42758.03	106.9	42577.83	106.4	P
Lead	4000.0	3748.42	93.7	4000.0	3823.52	95.6	3837.65	95.9	P
Magnesium	40000.0	411216	1028	40000.0	42527.53	106.3	42278.61	105.7	P
Manganese	4000.0	4227.95	105.7	4000.0	4353.09	108.8	4386.43	109.7	P
Mercury	4.0	3.20	80.0	4.0	3.20	80.0	3.80	95.0	CV
Nickel	4000.0	4318.27	108.0	4000.0	4346.05	108.7	4394.16	109.9	P
Potassium	40000.0	41236.5	103.1	40000.0	42293.90	105.7	41781.87	104.5	P
Selenium	4000.0	3826.57	95.7	4000.0	3902.42	97.6	3907.08	97.7	P
Silver	4000.0	3925.55	98.1	4000.0	3928.86	98.2	3721.81	93.0	P
Sodium	40000.0	41501.4	103.8	40000.0	43400.80	108.5	43182.45	108.0	P
Thallium	4000.0	4024.14	100.6	4000.0	4046.82	101.2	4052.71	101.3	P
Vanadium	4000.0	3878.23	97.0	4000.0	3957.02	98.9	3979.15	99.5	P
Zinc	4000.0	4059.49	101.5	4000.0	4232.14	105.8	4236.54	105.9	P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	43004.61	107.5	41899.85	104.7	P
Antimony				4000.0	3818.87	95.5	3913.44	97.8	P
Arsenic				4000.0	3897.45	97.4	3818.99	95.5	P
Barium				4000.0	3933.83	98.3	3868.37	96.7	P
Beryllium				4000.0	4115.92	102.9	4100.88	102.5	P
Cadmium				4000.0	3969.63	99.2	4002.66	100.1	P
Calcium				40000.0	43232.61	108.1	41714.92	104.3	P
Chromium				4000.0	3874.06	96.9	3802.61	95.1	P
Cobalt				4000.0	4086.21	102.2	4103.36	102.6	P
Copper				4000.0	3869.87	96.7	3852.84	96.3	P
Iron				40000.0	42577.83	106.4	42017.95	105.0	P
Lead				4000.0	3833.64	95.8	3829.60	95.7	P
Magnesium				40000.0	42741.66	106.9	40826.54	102.1	P
Manganese				4000.0	4211.86	105.3	4238.61	106.0	P
Mercury				4.0	3.80	95.0			CV
Nickel				4000.0	4116.12	102.9	4149.30	103.7	P
Potassium				40000.0	42447.51	106.1	40501.79	101.3	P
Selenium				4000.0	3752.66	93.8	3783.94	94.6	P
Silver				4000.0	3840.71	96.0	3683.88	92.1	P
Sodium				40000.0	43703.20	109.3	41841.45	104.6	P
Thallium				4000.0	3830.60	95.8	3798.21	95.0	P
Vanadium				4000.0	3816.87	95.4	3820.81	95.5	P
Zinc				4000.0	4263.69	106.6	4165.89	104.1	P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	42250.13	105.6			P
Antimony				4000.0	3886.94	97.2			P
Arsenic				4000.0	4139.97	103.5			P
Barium				4000.0	4136.90	103.4			P
Beryllium				4000.0	4125.50	103.1			P
Cadmium				4000.0	4090.95	102.3			P
Calcium				40000.0	43300.26	108.3			P
Chromium				4000.0	4000.51	100.0			P
Cobalt				4000.0	4251.90	106.3			P
Copper				4000.0	4086.54	102.2			P
Iron				40000.0	42741.72	106.9			P
Lead				4000.0	3957.94	98.9			P
Magnesium				40000.0	42437.23	106.1			P
Manganese				4000.0	4342.43	108.6			P
Mercury									NR
Nickel				4000.0	4427.62	110.7			P
Potassium				40000.0	40525.51	101.3			P
Selenium				4000.0	4168.15	104.2			P
Silver				4000.0	3932.70	98.3			P
Sodium				40000.0	42534.56	106.3			P
Thallium				4000.0	4138.38	103.5			P
Vanadium				4000.0	4006.14	100.2			P
Zinc				4000.0	4327.56	108.2			P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic	50.0	54.10	108.2	50.0	54.13	108.3	53.67	107.3	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	50.0	45.59	91.2	50.0	45.57	91.1	49.07	98.1	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium	50.0	54.40	108.8	50.0	48.47	96.9	45.94	91.9	F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	54.97	109.9	52.94	105.9	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	47.27	94.5	54.16	108.3	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium				50.0	44.76	89.5	49.52	99.0	F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00011

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	52.71	105.4	48.56	97.1	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	50.0	46.60	93.2	50.0	50.14	100.3	52.36	104.7	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium				50.0	50.91	101.8	54.67	109.3	F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	49.81	99.6	48.72	97.4	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	51.24	102.5	55.02	110.0	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium				50.0	49.06	98.1			F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00013

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	50.75	101.5			F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	54.98	110.0	54.98	110.0	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00014

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	45.65	91.3	45.55	91.1	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00015

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	47.81	95.6	51.70	103.4	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

AA CRDL Standard Source: NBS_____

ICP CRDL Standard Source: NBS_____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony				120.0	114.64	95.5	108.53	90.4
Arsenic	20.0	18.42	92.1	60.0	59.53	99.2	46.62	77.7
Barium								
Beryllium				10.0	9.54	95.4	9.64	96.4
Cadmium				10.0	10.61	106.1	10.14	101.4
Calcium								
Chromium				20.0	22.51	112.6	22.99	115.0
Cobalt				100.0	104.80	104.8	94.94	94.9
Copper				50.0	50.78	101.6	51.33	102.7
Iron								
Lead	10.0	10.46	104.6	60.0	50.51	84.2	53.22	88.7
Magnesium								
Manganese				30.0	29.30	97.7	28.13	93.8
Mercury	0.4	0.40	100.0					
Nickel				80.0	19.75	24.7	67.29	84.1
Potassium								
Selenium	10.0	11.28	112.8	120.0	114.48	95.4	125.38	104.5
Silver				20.0	19.47	97.4	23.01	115.0
Sodium								
Thallium				60.0	52.57	87.6	39.14	65.2
Vanadium				100.0	100.31	100.3	94.52	94.5
Zinc				40.0	59.68	149.2	71.33	178.3

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

AA CRDL Standard Source: NBS_____

ICP CRDL Standard Source: NBS_____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony								
Arsenic								
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	10.0	11.07	110.7					
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Vanadium								
Zinc								

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-01098

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	P
Antimony	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Arsenic	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	4.1	B	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.1	B	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Calcium	30.0	U	30.0	U	30.0	U	30.0	U	48.8	B	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Cobalt	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	20.4	B	P
Lead	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	2.2	B	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U			CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1639.0	B	P
Selenium	60.0	U	60.0	U	60.0	U	60.0	U	60.0	U	P
Silver	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Sodium	200.0	U	200.0	U	200.0	U	200.0	U	200.0	U	P
Thallium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	12.7	B	P
Boron											NR

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-010989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			40.0	U	40.0	U					P
Antimony			30.0	U	30.0	U					P
Arsenic			30.0	U	30.0	U					P
Barium			2.0	U	2.0	U					P
Beryllium			1.0	U	1.0	U					P
Cadmium			5.0	U	5.0	U					P
Calcium			30.0	U	30.0	U					P
Chromium			10.0	U	10.0	U					P
Cobalt			20.0	U	20.0	U					P
Copper			10.0	U	10.0	U					P
Iron			10.0	U	10.0	U					P
Lead			30.0	U	30.0	U					P
Magnesium			30.0	U	30.0	U					P
Manganese			2.0	U	2.0	U					P
Mercury											NR
Nickel			20.0	U	20.0	U					P
Potassium			1000.0	U	1000.0	U					P
Selenium			60.0	U	60.0	U					P
Silver			5.0	U	5.0	U					P
Sodium			200.0	U	200.0	U					P
Thallium			30.0	U	30.0	U					P
Vanadium			10.0	U	10.0	U					P
Zinc			5.0	U	5.0	U					P
Boron											NR

U.S. EPA - CLP

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-01098

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

U.S. EPA - CLP

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3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-010989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic			2.0	U	2.0	U	2.0	U			F
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U							F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium			2.0	U	2.0	U	2.0	U			F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

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3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-010989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic			2.0	U	2.0	U					F
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	2.0	U	2.0	U	2.0	U	2.0	U			F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium			2.0	U							F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-010989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U	2.0	U			F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

U.S. EPA - CLP

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BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-010989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U	2.0	U			F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

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3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-010989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U							F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

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4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

ICP ID Number: JA1100_____ ICS Source: SPEX_____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Aluminum	500000	485000	477763	500815.3	103.3	486015	488970.9	100.8
Antimony								
Arsenic								
Barium		471		464.8	98.7		470.5	99.9
Beryllium		520		500.6	96.3		484.1	93.1
Cadmium		990		859.8	86.8		847.9	85.6
Calcium	500000	509000	471158	490510.5	96.4	477879	483841.0	95.1
Chromium		452		441.7	97.7		445.5	98.6
Cobalt		459		438.7	95.6		389.2	84.8
Copper		441		428.6	97.2		424.0	96.1
Iron	200000	188000	174102	186767.8	99.3	176865	183200.6	97.4
Lead		1010		891.5	88.3		880.1	87.1
Magnesium	500000	495000	481348	497696.8	100.5	493459	489798.6	98.9
Manganese		451		432.8	96.0		424.7	94.2
Mercury								
Nickel		863		780.2	90.4		803.8	93.1
Potassium								
Selenium								
Silver		909		896.4	98.6		1057.2	116.3
Sodium								
Thallium								
Vanadium		467		462.7	99.1		452.4	96.9
Zinc		920		871.7	94.7		898.8	97.7

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7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOM

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

LCSWC0748

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	20000.0	21461.72	107.3						
Antimony	4000.0	3338.96	83.5						
Arsenic	4000.0	3700.21	92.5						
Barium	4000.0	3908.26	97.7						
Beryllium	4000.0	4121.25	103.0						
Cadmium	4000.0	4124.75	103.1						
Calcium	20000.0	21835.92	109.2						
Chromium	4000.0	3912.47	97.8						
Cobalt	4000.0	4023.11	100.6						
Copper	4000.0	3792.77	94.8						
Iron	20000.0	21373.73	106.9						
Lead	4000.0	3796.85	94.9						
Magnesium	20000.0	21261.76	106.3						
Manganese	4000.0	3772.41	94.3						
Mercury									
Nickel	4000.0	3820.11	95.5						
Potassium	20000.0	22273.42	111.4						
Selenium	4000.0	3732.02	93.3						
Silver	4000.0	2301.66	57.5						
Sodium	20000.0	21272.40	106.4						
Thallium	4000.0	3718.86	93.0						
Vanadium	4000.0	3807.04	95.2						
Zinc	4000.0	4066.14	101.7						
Boron									

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7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic	40.0	32.00	80.0						
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20.0	16.00	80.0						
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium	20.0	16.80	84.0						
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Boron									

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9

ICP SERIAL DILUTION

EPA SAMPLE NO.

L

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44238 SAS No.: SDG No.: MW-010989

Matrix (soil/water): WATER Level (low/med):

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							F
Antimony							F
Arsenic							F
Barium	53.70	B	59.00	B	9.9		P
Beryllium							F
Cadmium	5.00	U	25.00	U			NR
Calcium							F
Chromium	10.00	U	50.00	U			NR
Cobalt							F
Copper							F
Iron	701.10		846.50		20.7	E	P
Lead							F
Magnesium							F
Manganese	61.00		95.50		56.6		P
Mercury							
Nickel							F
Potassium							F
Selenium							F
Silver	5.00	U	25.00	U			NR
Sodium	~~1254000.00~~		7921000.00		~~531.7~~	E	P
Thallium	6,270,000 CWK				-26.3 CWK		CV
Vanadium							F
Zinc							F

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10
HOLDING TIMES

Lab Name: ITAS-KNOXVILLE Contract: COE-Holloman AFB

Lab Code: IT-STU Case No.: 44238 SAS No.: _____ SDG No.: MW-01098

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
MW-010989	water	09/28/89	10/10/89	12		
MW-050989	water	09/28/89	10/10/89	12		
MW-080989	water	09/28/89	10/10/89	12		
MW-120989	water	09/28/89	10/10/89	12		

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11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

ICP ID Number: JA1100_____ Date: 07/01/89

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

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00032

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

ICP ID Number: _____ Date: 07/01/89

Flame AA ID Number : _____

Furnace AA ID Number : 5100/600____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	196.00		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	283.30		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.0	F
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

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00033

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

ICP ID Number: _____ Date: 07/01/89

Flame AA ID Number : 151_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

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12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44238_____ SAS No.: _____ SDG No.: MW-010989_

ICP ID Number: JA1100_____ Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	AS
Aluminum	308.20					
Antimony	206.80					
Arsenic	193.60	0.0103600		0.0013600		
Barium	493.40					
Beryllium	313.00					
Cadmium	228.80					
Calcium	317.90					0.0055600
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30	0.0006800				
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0103900		
Vanadium	292.40					
Zinc	213.80					

Comments:

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE Holloman AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-01098

ICP ID Number: JA1100_____ Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : BA	BE	CO	CR	NI
Aluminum	308.20					
Antimony	206.80				0.0055800	
Arsenic	193.60	0.0006600		0.0005200		
Barium	493.40					
Beryllium	313.00				0.0002800	0.0001200
Cadmium	228.80		0.0025800			
Calcium	317.90					
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30					
Magnesium	279.00					
Manganese	257.60					
Mercury						
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0018300		
Vanadium	292.40					
Zinc	213.80					0.0032600

Comments:

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00036

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - Hollman AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-010989

ICP ID Number: JA1100_____ Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : V_	__	__	__	__
Aluminum	308.20	0.0218400				
Antimony	206.80					
Arsenic	193.60	0.0128200				
Barium	493.40					
Beryllium	313.00	0.0062300				
Cadmium	228.80					
Calcium	317.90					
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30					
Magnesium	279.00					
Manganese	257.60					
Mercury						
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80	0.0019670				
Vanadium	292.40					
Zinc	213.80					0.0000000

Comments:

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00037

13
ICP LINEAR RANGES (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: CDE - Holloman AFB

Lab Code: ITSTU_ Case No.: 44238 SAS No.: _____ SDG No.: MW-010989

ICP ID Number: JA1100_____ Date: 07/01/89

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	
Antimony	6.00	15000.0	
Arsenic	6.00	15000.0	
Barium	6.00	15000.0	
Beryllium	6.00	15000.0	
Cadmium	6.00	15000.0	
Calcium	6.00	500000.0	
Chromium	6.00	15000.0	
Cobalt	6.00	15000.0	
Copper	6.00	40000.0	
Iron	6.00	500000.0	
Lead	6.00	40000.0	
Magnesium	6.00	500000.0	
Manganese	6.00	40000.0	
Mercury			NR
Nickel	6.00	15000.0	
Potassium	6.00	500000.0	
Selenium	6.00	15000.0	
Silver	6.00	15000.0	
Sodium	6.00	500000.0	
Thallium	6.00	15000.0	
Vanadium	6.00	12000.0	
Zinc	6.00	40000.0	

Comments:

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IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

November 3, 1989

Job Number: ITNA 44251 Corrected Certificate

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/29/89
Number of Samples:	Three (3)
Sample Type:	Water

I. Introduction

On 09/29/89, three (3) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection based on SW-846 method 9060.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

INTERNATIONAL TECHNOLOGY CORPORATION

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CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

October 27, 1989

Job Number: ITNA 44251

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/29/89
Number of Samples:	Three (3)
Sample Type:	Water

I. Introduction

On 09/29/89, three (3) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection using EPA method 415.1.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

II. Analytical Results/Methodology (continued)

Th samples were analyzed for phenols by colorimetric determination using EPA SW-846 method 9065.

The samples were analyzed for nitrate and nitrite by colorimetric determination using EPA method 353.3.

The samples were analyzed for requested anions by ion chromatography using EPA method 300.0.

The samples were analyzed for fluoride by potentiometric determination using EPA method 340.2.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were extracted for pesticides and herbicides on 10/02/89. The samples were analyzed on 10/04/89 and 10/05/89. No problems were encountered. The pesticide extracts were treated for sulfur interference prior to analysis using SW-846 method 3660.

The samples were analyzed for total organic carbon (TOC) on 10/12/89. No problems were encountered.

The phenol analyses were performed on 10/10/89. No problems were encountered.

The nitrate and nitrite analyses were performed on 10/17/89 and 10/12/89, respectively. No problems were encountered.

The anion analyses were performed on 10/11/89. No problems were encountered.

The fluoride determination was performed on 10/13/89. No problems were encountered.

International Technology
October 27, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44251

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	Method Blank Summary
Lab Sample ID:	BL4873/4876
Lindane	0.1 U
Endrin	0.1 U
Methoxychlor	0.1 U
Toxaphene	0.5 U
2,4-D	1.2 U
Silvex	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 10/02/89
Date Analyzed: (Pesticides) 10/04/89
(Herbicides) 10/05/89

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October 27, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44251

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	MW-020989	MW-030989	MW-070989
Lab Sample ID:	JJ6714	JJ6715	JJ6716
Lindane	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 10/02/89
Date Analyzed: (Pesticides) 10/04/89
(Herbicides) 10/05/89

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October 27, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44251

TOTAL ORGANIC CARBON ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
Method Blank	D0234	1 U
MW-020989	JJ6700	5
MW-030989	JJ6701	9
MW-070989	JJ6717	4

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 10/12/89

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International Technology
October 27, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44251

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	Method Blank -	MW-020989 JJ6702/JJ6705/JJ6708	Analysis Date
Chloride	0.5 U	1,100	10/11/89
Fluoride	0.1 U	1.3	10/13/89
Sulfate	1.5 U	2,100	10/11/89
Nitrate, as N	0.05 U	0.12	10/17/89
Nitrite, as N	0.01 U	0.01 U	10/12/89
Phenols	0.01 U	0.01	10/10/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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International Technology
October 27, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44251

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	MW-030989	MW-070989	Analysis
Lab Sample ID:	JJ6703/JJ6706/JJ6709	JJ6704/JJ6707/JJ6710	Date
Chloride	4,800	1,100	10/11/89
Fluoride	1.4	2.1	10/13/89
Sulfate	3,900	2,400	10/11/89
Nitrate, as N	0.10	0.18	10/17/89
Nitrite, as N	0.01 U	0.01 U	10/12/89
Phenols	0.01 U	0.01 U	10/10/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

October 31, 1989

Job Number: ITNA 44251

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	09/29/89
Number of Samples:	Three (3)
Sample Type:	Water

I. Introduction

On 09/29/89, three (3) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that CLP data are not blank corrected.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

III. Quality Control

The samples were digested on 10/06/89 for ICP and 10/06/89 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 10/10/89; the GFAA analyses for arsenic, lead and selenium, were performed on 10/13-26/89; due to lead contamination in the method blank for the graphite furnace analyses, the samples were redigested on 10/25/89 and analyzed 10/26/89. The remaining metals were analyzed by ICP on 10/12/89. All run QC was acceptable. Associated QC samples were analyzed with ITAS project ITNA 44233, sample MW-040989.

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Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply
X - Detection limits higher than normal due to sample matrix interferences.

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

SOW No.: 7/87_

EPA Sample No.	Lab Sample ID.
_MW-020989____	JJ6711_____
_MW-030989____	JJ6712_____
_MW-070989____	JJ6713_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager: _____

Date: _____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-020989

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Matrix (soil/water): WATER Lab Sample ID: JJ6711____

Level (low/med): _____ Date Received: 10/26/89

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_		_		NR
7440-36-0	Antimony_		_		NR
7440-38-2	Arsenic__	3.0	B		F_
7440-39-3	Barium___	25.0	B		P_
7440-41-7	Beryllium		_		NR
7440-43-9	Cadmium__	5.0	U		P_
7440-70-2	Calcium__		_		NR
7440-47-3	Chromium_	10	U		P_
7440-48-4	Cobalt___		_		NR
7440-50-8	Copper___		_		NR
7439-89-6	Iron_____	243	_		P_
7439-92-1	Lead_____	30.0	U		P_
7439-95-4	Magnesium		_		NR
7439-96-5	Manganese	930	_		P_
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___		_		NR
7440-09-7	Potassium		_		NR
7782-49-2	Selenium_	31.0	U	W	F_
7440-22-4	Silver___	182	_		P_
7440-23-5	Sodium___	572000	_	E	P_
7440-28-0	Thallium_		_		NR
7440-62-2	Vanadium_		_		NR
7440-66-6	Zinc_____		_		NR
	Boron____		_		NR
			_		

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: ___

Comments:
REPORTED_ICAP_VALUE_FOR_LEAD_INSTEAD_OF_GFAA,_DUE_TO_MATRIX_____
INTERFERENCE_THE_ICAP_HAD_A_LOWER_DETECTION_LIMIT_____

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-030989

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44251 SAS No.: SDG No.: MW-020989

Matrix (soil/water): WATER Lab Sample ID: JJ6712

Level (low/med): Date Received: 10/26/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	12.0	U	W	F
7440-39-3	Barium	16.9	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	26.6			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	608			P
7439-92-1	Lead	22.0	U	W	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	1670			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	28.0	U	W	F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	2940000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Boron				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-070989

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44251 SAS No.: SDG No.: MW-020989

Matrix (soil/water): WATER Lab Sample ID: JJ6713

Level (low/med): Date Received: 10/25/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic	8.0	U		F
7440-39-3	Barium	31.2	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	13.8			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	857			P
7439-92-1	Lead	32.0	U	W	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	984			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium	29.0	U	W	F
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	698000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Boron				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40000.0	41189.3	103.0	40000.0	42759.10	106.9	42628.93	106.6	P
Antimony	4000.0	4012.24	100.3	4000.0	4124.87	103.1	4198.48	105.0	P
Arsenic	4000.0	3719.12	93.0	4000.0	3841.44	96.0	3894.65	97.4	P
Barium	4000.0	3819.94	95.5	4000.0	4014.62	100.4	3976.78	99.4	P
Beryllium	4000.0	3984.99	99.6	4000.0	4204.53	105.1	4180.41	104.5	P
Cadmium	4000.0	4049.17	101.2	4000.0	4140.03	103.5	4153.97	103.8	P
Calcium	40000.0	41790.6	104.5	40000.0	43382.79	108.5	43243.56	108.1	P
Chromium	4000.0	3713.57	92.8	4000.0	3884.80	97.1	3879.22	97.0	P
Cobalt	4000.0	4133.36	103.3	4000.0	4240.76	106.0	4250.50	106.3	P
Copper	4000.0	3978.64	99.5	4000.0	4059.08	101.5	4057.84	101.4	P
Iron	40000.0	41107.0	102.8	40000.0	42758.03	106.9	42577.83	106.4	P
Lead	4000.0	3748.42	93.7	4000.0	3823.52	95.6	3837.65	95.9	P
Magnesium	40000.0	411216	1028	40000.0	42527.53	106.3	42278.61	105.7	P
Manganese	4000.0	4227.95	105.7	4000.0	4353.09	108.8	4386.43	109.7	P
Mercury	4.0	3.20	80.0	4.0	3.20	80.0	3.80	95.0	CV
Nickel	4000.0	4318.27	108.0	4000.0	4346.05	108.7	4394.16	109.9	P
Potassium	40000.0	41236.5	103.1	40000.0	42293.90	105.7	41781.87	104.5	P
Selenium	4000.0	3826.57	95.7	4000.0	3902.42	97.6	3907.08	97.7	P
Silver	4000.0	3925.55	98.1	4000.0	3928.86	98.2	3721.81	93.0	P
Sodium	40000.0	41501.4	103.8	40000.0	43400.80	108.5	43182.45	108.0	P
Thallium	4000.0	4024.14	100.6	4000.0	4046.82	101.2	4052.71	101.3	P
Vanadium	4000.0	3878.23	97.0	4000.0	3957.02	98.9	3979.15	99.5	P
Zinc	4000.0	4059.49	101.5	4000.0	4232.14	105.8	4236.54	105.9	P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	43004.61	107.5	41899.85	104.7	P
Antimony				4000.0	3818.87	95.5	3913.44	97.8	P
Arsenic				4000.0	3897.45	97.4	3818.99	95.5	P
Barium				4000.0	3933.83	98.3	3868.37	96.7	P
Beryllium				4000.0	4115.92	102.9	4100.88	102.5	P
Cadmium				4000.0	3969.63	99.2	4002.66	100.1	P
Calcium				40000.0	43232.61	108.1	41714.92	104.3	P
Chromium				4000.0	3874.06	96.9	3802.61	95.1	P
Cobalt				4000.0	4086.21	102.2	4103.36	102.6	P
Copper				4000.0	3869.87	96.7	3852.84	96.3	P
Iron				40000.0	42577.83	106.4	42017.95	105.0	P
Lead				4000.0	3833.64	95.8	3829.60	95.7	P
Magnesium				40000.0	42741.66	106.9	40826.54	102.1	P
Manganese				4000.0	4211.86	105.3	4238.61	106.0	P
Mercury				4.0	3.80	95.0			CV
Nickel				4000.0	4116.12	102.9	4149.30	103.7	P
Potassium				40000.0	42447.51	106.1	40501.79	101.3	P
Selenium				4000.0	3752.66	93.8	3783.94	94.6	P
Silver				4000.0	3840.71	96.0	3683.88	92.1	P
Sodium				40000.0	43703.20	109.3	41841.45	104.6	P
Thallium				4000.0	3830.60	95.8	3798.21	95.0	P
Vanadium				4000.0	3816.87	95.4	3820.81	95.5	P
Zinc				4000.0	4263.69	106.6	4165.89	104.1	P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	42250.13	105.6			P
Antimony				4000.0	3886.94	97.2			P
Arsenic				4000.0	4139.97	103.5			P
Barium				4000.0	4136.90	103.4			P
Beryllium				4000.0	4125.50	103.1			P
Cadmium				4000.0	4090.95	102.3			P
Calcium				40000.0	43300.26	108.3			P
Chromium				4000.0	4000.51	100.0			P
Cobalt				4000.0	4251.90	106.3			P
Copper				4000.0	4086.54	102.2			P
Iron				40000.0	42741.72	106.9			P
Lead				4000.0	3957.94	98.9			P
Magnesium				40000.0	42437.23	106.1			P
Manganese				4000.0	4342.43	108.6			P
Mercury									NR
Nickel				4000.0	4427.62	110.7			P
Potassium				40000.0	40525.51	101.3			P
Selenium				4000.0	4168.15	104.2			P
Silver				4000.0	3932.70	98.3			P
Sodium				40000.0	42534.56	106.3			P
Thallium				4000.0	4138.38	103.5			P
Vanadium				4000.0	4006.14	100.2			P
Zinc				4000.0	4327.56	108.2			P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic	50.0	54.10	108.2	50.0	54.13	108.3	53.67	107.3	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	50.0	52.40	104.8	50.0	50.80	101.6	46.80	93.6	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium	50.0	54.40	108.8	50.0	48.47	96.9	45.94	91.9	F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	54.97	109.9	52.94	105.9	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	50.00	100.0	55.00	110.0	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium				50.0	44.76	89.5	49.52	99.0	F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	52.71	105.4	48.56	97.1	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium				50.0	50.91	101.8	54.67	109.3	F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	49.81	99.6	48.72	97.4	F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium				50.0	49.06	98.1			F
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	50.75	101.5			F
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

AA CRDL Standard Source: NBS_____

ICP CRDL Standard Source: NBS_____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony				120.0	114.64	95.5	108.53	90.4
Arsenic	20.0	18.42	92.1	60.0	59.53	99.2	46.62	77.7
Barium								
Beryllium				10.0	9.54	95.4	9.64	96.4
Cadmium				10.0	10.61	106.1	10.14	101.4
Calcium								
Chromium				20.0	22.51	112.6	22.99	115.0
Cobalt				100.0	104.80	104.8	94.94	94.9
Copper				50.0	50.78	101.6	51.33	102.7
Iron								
Lead	10.0	12.13	121.3	60.0	50.51	84.2	53.22	88.7
Magnesium								
Manganese				30.0	29.30	97.7	28.13	93.8
Mercury	0.4	0.40	100.0					
Nickel				80.0	19.75	24.7	67.29	84.1
Potassium								
Selenium	10.0	11.28	112.8	120.0	114.48	95.4	125.38	104.5
Silver				20.0	19.47	97.4	23.01	115.0
Sodium								
Thallium				60.0	52.57	87.6	39.14	65.2
Vanadium				100.0	100.31	100.3	94.52	94.5
Zinc				40.0	59.68	149.2	71.33	178.3

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3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44251 SAS No.: _____ SDG No.: MW-020989

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	P
Antimony	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Arsenic	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	4.1	B	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.1	B	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Calcium	30.0	U	30.0	U	30.0	U	30.0	U	48.8	B	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Cobalt	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	20.4	B	P
Lead	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	2.2	B	P
Mercury											NR
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1638.5	B	P
Selenium	60.0	U	60.0	U	60.0	U	60.0	U	60.0	U	P
Silver	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Sodium	200.0	U	200.0	U	200.0	U	200.0	U	200.0	U	P
Thallium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	12.7	B	P
Boron											NR

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BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-Holloman AFB

Lab Code: ITSTU_ Case No.: _____ SAS No.: _____ SDG No.: MW-020989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			40.0	U	40.0	U					P
Antimony			30.0	U	30.0	U					P
Arsenic			30.0	U	30.0	U					P
Barium			2.0	U	2.0	U					P
Beryllium			1.0	U	1.0	U					P
Cadmium			5.0	U	5.0	U					P
Calcium			30.0	U	30.0	U					P
Chromium			10.0	U	10.0	U					P
Cobalt			20.0	U	20.0	U					P
Copper			10.0	U	10.0	U					P
Iron			10.0	U	10.0	U					P
Lead			30.0	U	30.0	U					P
Magnesium			30.0	U	30.0	U					P
Manganese			2.0	U	2.0	U					P
Mercury											NR
Nickel			20.0	U	20.0	U					P
Potassium			1000.0	U	1000.0	U					P
Selenium			60.0	U	60.0	U					P
Silver			5.0	U	5.0	U					P
Sodium			200.0	U	200.0	U					P
Thallium			30.0	U	30.0	U					P
Vanadium			10.0	U	10.0	U					P
Zinc			5.0	U	5.0	U					P
Boron											NR

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BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44251 SAS No.: _____ SDG No.: MW-020989

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic			2.0	U	2.0	U	2.0	U	2.0	U	F
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U	2.0	U	2.0	U	F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium			2.0	U	2.0	U	2.0	U	2.0	U	F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

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BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44251 SAS No.: _____ SDG No.: MW-020989

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic			2.0	U	2.0	U	2.0	U			F
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U							F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium			2.0	U	2.0	U	2.0	U	2.0	U	F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

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BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44251 SAS No.: _____ SDG No.: MW-020989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic			2.0	U	2.0	U	2.0	U			F
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead											NR
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium			2.0	U	2.0	U	2.0	U			F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

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BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: 44251 SAS No.: _____ SDG No.: MW-020989

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic			2.0	U	2.0	U	2.0	U			F
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead											NR
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium			2.0	U							F
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Boron											NR

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ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

ICP ID Number: JA1100_____ ICS Source: SPEX_____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	500000	485000	477763	500815.3	103.3	486015	488970.9	100.8
Antimony								
Arsenic								
Barium		471		464.8	98.7		470.5	99.9
Beryllium		520		500.6	96.3		484.1	93.1
Cadmium		990		859.8	86.8		847.9	85.6
Calcium	500000	509000	471158	490510.5	96.4	477879	483841.0	95.1
Chromium		452		441.7	97.7		445.5	98.6
Cobalt		459		438.7	95.6		389.2	84.8
Copper		441		428.6	97.2		424.0	96.1
Iron	200000	188000	174102	186767.8	99.3	176865	183200.6	97.4
Lead		1010		891.5	88.3		880.1	87.1
Magnesium	500000	495000	481348	497696.8	100.5	493459	489798.6	98.9
Manganese		451		432.8	96.0		424.7	94.2
Mercury								
Nickel		863		780.2	90.4		803.8	93.1
Potassium								
Selenium								
Silver		909		896.4	98.6		1057.2	116.3
Sodium								
Thallium								
Vanadium		467		462.7	99.1		452.4	96.9
Zinc		920		871.7	94.7		898.8	97.7

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LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	20000.0	21461.72	107.3						
Antimony	4000.0	3338.96	83.5						
Arsenic	4000.0	3700.21	92.5						
Barium	4000.0	3908.26	97.7						
Beryllium	4000.0	4121.25	103.0						
Cadmium	4000.0	4124.75	103.1						
Calcium	20000.0	21835.92	109.2						
Chromium	4000.0	3912.47	97.8						
Cobalt	4000.0	4023.11	100.6						
Copper	4000.0	3792.77	94.8						
Iron	20000.0	21373.73	106.9						
Lead	4000.0	3796.85	94.9						
Magnesium	20000.0	21261.76	106.3						
Manganese	4000.0	3772.41	94.3						
Mercury									
Nickel	4000.0	3820.11	95.5						
Potassium	20000.0	22273.42	111.4						
Selenium	4000.0	3732.02	93.3						
Silver	4000.0	2301.66	57.5						
Sodium	20000.0	21272.40	106.4						
Thallium	4000.0	3718.86	93.0						
Vanadium	4000.0	3807.04	95.2						
Zinc	4000.0	4066.14	101.7						
Boron									

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LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic	40.0	32.00	80.0						
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium	20.0	16.80	84.0						
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Boron									

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LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20.0	22.95	114.8						
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Boron									

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ICP SERIAL DILUTION

EPA SAMPLE NO.

L

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44251 SAS No.: SDG No.: MW-020989

Matrix (soil/water): WATER Level (low/med):

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							F
Antimony							F
Arsenic							F
Barium	25.00	B	28.00	B	12.0		P
Beryllium							F
Cadmium	5.00	U	25.00	U			NR
Calcium							F
Chromium	10.00	U	50.00	U			NR
Cobalt							F
Copper							F
Iron	243.10		234.80	B	3.4		P
Lead							F
Magnesium							F
Manganese	930.40		1016.00		9.2		P
Mercury							
Nickel							F
Potassium							F
Selenium							F
Silver	181.90		25.00	U			NR
Sodium	572200.00		~~2985000.00~~		~~421.7~~	E	P
Thallium			597,000		4.3		CV
Vanadium							F
Zinc							F

FORM IX - IN

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HOLDING TIMES

Lab Name: ITAS-KNOXVILLE Contract: COE Holloman AFB

Lab Code: IT-STU Case No.: 44251 SAS No.: _____ SDG No.: mw-020

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
mw-020989	water	9/29/89	10/10/89	11		
mw-030989	water	9/29/89	10/10/89	11		
mw-070989	water	9/29/89	10/10/89	11		

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

ICP ID Number: JA1100_____ Date: 07/01/89

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

FORM XI - IN

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

ICP ID Number: _____ Date: 07/01/89

Flame AA ID Number : _____

Furnace AA ID Number : 5100/600____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	196.00		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	283.30		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.0	F
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

ICP ID Number: _____ Date: 07/01/89

Flame AA ID Number : _____

Furnace AA ID Number : 12E/188_____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	217.00		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

ICP ID Number: _____ Date: 07/01/89

Flame AA ID Number : 151_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

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ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

ICP ID Number: JA1100_____ Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	AS
Aluminum	308.20					
Antimony	206.80					
Arsenic	193.60	0.0103600		0.0013600		
Barium	493.40					
Beryllium	313.00					
Cadmium	228.80					
Calcium	317.90					0.0055600
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30	0.0006800				
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0103900		
Vanadium	292.40					
Zinc	213.80					

Comments:

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ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44251 SAS No.: SDG No.: MW-020989

ICP ID Number: JA1100 Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : BA	BE	CO	CR	NI
Aluminum	308.20					
Antimony	206.80				0.0055800	
Arsenic	193.60	0.0006600		0.0005200		
Barium	493.40					
Beryllium	313.00				0.0002800	0.0001200
Cadmium	228.80		0.0025800			
Calcium	317.90					
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30					
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0018300		
Vanadium	292.40					
Zinc	213.80					0.0032600

Comments:

U.S. EPA - CLP

00032

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

ICP ID Number: JA1100_____ Date: 07/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : V_	__	__	__	__
Aluminum_	308.20	0.0218400	-999999.00	-999999.00	-999999.00	-999999.00
Antimony_	206.80		-999999.00	-999999.00	-999999.00	-999999.00
Arsenic__	193.60	0.0128200	-999999.00	-999999.00	-999999.00	-999999.00
Barium___	493.40		-999999.00	-999999.00	-999999.00	-999999.00
Beryllium	313.00	0.0062300	-999999.00	-999999.00	-999999.00	-999999.00
Cadmium__	228.80		-999999.00	-999999.00	-999999.00	-999999.00
Calcium__	317.90		-999999.00	-999999.00	-999999.00	-999999.00
Chromium_	267.70		-999999.00	-999999.00	-999999.00	-999999.00
Cobalt___	228.60		-999999.00	-999999.00	-999999.00	-999999.00
Copper___	324.70		-999999.00	-999999.00	-999999.00	-999999.00
Iron_____	259.90		-999999.00	-999999.00	-999999.00	-999999.00
Lead_____	220.30		-999999.00	-999999.00	-999999.00	-999999.00
Magnesium	279.00		-999999.00	-999999.00	-999999.00	-999999.00
Manganese	257.60		-999999.00	-999999.00	-999999.00	-999999.00
Mercury__		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel___	231.60		-999999.00	-999999.00	-999999.00	-999999.00
Potassium	766.00		-999999.00	-999999.00	-999999.00	-999999.00
Selenium_	196.00		-999999.00	-999999.00	-999999.00	-999999.00
Silver___	328.00		-999999.00	-999999.00	-999999.00	-999999.00
Sodium___	588.90		-999999.00	-999999.00	-999999.00	-999999.00
Thallium_	190.80	0.0019670	-999999.00	-999999.00	-999999.00	-999999.00
Vanadium_	292.40		-999999.00	-999999.00	-999999.00	-999999.00
Zinc_____	213.80		-999999.00	-999999.00	-999999.00	0.0000000

Comments:

U.S. EPA - CLP

13

ICP LINEAR RANGES (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44251_____ SAS No.: _____ SDG No.: MW-020989_

ICP ID Number: JA1100_____ Date: 07/01/89

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	
Antimony	6.00	15000.0	
Arsenic	6.00	15000.0	
Barium	6.00	15000.0	
Beryllium	6.00	15000.0	
Cadmium	6.00	15000.0	
Calcium	6.00	500000.0	
Chromium	6.00	15000.0	
Cobalt	6.00	15000.0	
Copper	6.00	40000.0	
Iron	6.00	500000.0	
Lead	6.00	40000.0	
Magnesium	6.00	500000.0	
Manganese	6.00	40000.0	
Mercury			NR
Nickel	6.00	15000.0	
Potassium	6.00	500000.0	
Selenium	6.00	15000.0	
Silver	6.00	15000.0	
Sodium	6.00	900000.0	
Thallium	6.00	15000.0	
Vanadium	6.00	12000.0	
Zinc	6.00	40000.0	

Comments:

&&xxfcxExExExExExHpFxxExExExE

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Received: 09/29/89

ITRSL Oak Ridge REPORT
11/20/89 14:05:40

Work Order # R9-10-004

REPORT TO: IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN: JANICE STERRETT

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN: ERS
PHONE: 615-482-9707

CONTACT: JIM DILLARD

CLIENT: ITAS SAMPLES: 8
COMPANY: IT CORPORATION/MIDDLEBROOK
FACILITY: MIDDLEBROOK PIKE

WORK ID: WATER SAMPLES-ITNA44233,44238
TAKEN:
TRANS:
TYPE:
P.O. #: 486000.04 - ITNA 44233, 44238
INVOICE: under separate cover

ITNA 44233 - 4 SAMPLES; ITNA 44238 - 4 SAMPLES
TOTAL RADIUM COUNTED 10/5/89
GA COUNT DATES: 01A-05A, 07A, 08A 10/19/89; 06A 10/26/89
GB COUNT DATES: 01A-05A,08A 10/18/9; 06A 10/25/9; 07A 10/19/9

	SAMPLE IDENTIFICATION
01	JJ6552
02	JJ6553
03	JJ6554
04	JJ6555
05	JJ6506
06	JJ6507
07	JJ6508
09	JJ6509

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETAW	GROSS BETA
RA226	RA-226
SPEC	SPECIAL FORM FOR REPORTING

RECEIVED
DEC 4 1989
IT CORP.-ALBUQUERQUE
12/7/89

Received: 09/29/89

ITRSL Oak Ridge REPORT Work Order # R9-10-004
Results by Sample

SAMPLE ID JJ6552 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/27/89 Category 117392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<505		pCi/l
GROSS BETA	<450		pCi/l
TOTAL RADIUM	<5.0		pCi/l

RECEIVED
DEC 4 1989
IT CORP.-ALBUQUERQUE

SAMPLE ID JJ6553 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/27/89 Category 117392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<63		pCi/l
GROSS BETA	<90		pCi/l
TOTAL RADIUM	5.3	0.9	pCi/l

Received: 09/29/89

ITRSL Oak Ridge REPORT Work Order # R9-10-004
Results by Sample

SAMPLE ID JJ6554 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/27/89 Category 117392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<88		pCi/l
GROSS BETA	110	60	pCi/l
TOTAL RADIUM	<5.0		pCi/l

RECEIVED
DEC 4 1989
IT CORP.-ALBUQUERQUE

SAMPLE ID JJ6555 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/27/89 Category 117392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<330		pCi/l
GROSS BETA	<450		pCi/l
TOTAL RADIUM	<5.0		pCi/l

SAMPLE ID JJ6506 FRACTION 05A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/26/89 Category 117394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<300		pCi/l
GROSS BETA	<140		pCi/l
TOTAL RADIUM	<5.0		pCi/l

RECEIVED
4 1989
IT CORP.-ALBUQUERQUE

SAMPLE ID JJ6507 FRACTION 06A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/26/89 Category 117394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA *	<990		pCi/l
GROSS BETA *	<1240		pCi/l
TOTAL RADIUM	10.1	1.5	pCi/

*HIGH LLD'S ARE DUE TO
SMALL SAMPLE VOLUME USED
AND HIGH DISSOLVED SOLIDS
IN THIS SAMPLE.

Received: 09/29/89

ITRSL Oak Ridge REPORT Work Order # R9-10-004
Results by Sample

SAMPLE ID JJ6508 FRACTION 07A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/26/89 Category 117394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<80		pCi/l
GROSS BETA	<116		pCi/l
TOTAL RADIUM	<5.0		pCi/l

RECEIVED
DEC 4 1989
IT CORP.-ALBUQUERQUE

SAMPLE ID JJ6509 FRACTION 08A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/26/89 Category 117394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<440		pCi/l
GROSS BETA	<440		pCi/l
TOTAL RADIUM	6.2	1.0	pCi/l

DEC 5

Received: 10/02/89

ITRSL Oak Ridge REPORT
12/05/89 10:07:44

Work Order # R9-11-046

REPORT TO
IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN JANICE STERRETT

PREPARED BY
IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN ERS
PHONE 615-482-9707

CONTACT JIM DILLARD

CLIENT ITAS SAMPLES 3
COMPANY IT CORPORATION/MIDDLEBROOK
FACILITY MIDDLEBROOK PIKE

WORK ID WATER SAMPLES / ITNA 44251
TAKEN
TRANS
TYPE
P.O. # 486000.04
INVOICE under separate cover

RECEIVED
DEC 07 1989
IT CORP.-ALBUQUERQUE

SAMPLE IDENTIFICATION	
01	JJ6697, MW020989
02	JJ6698, MW030989
03	JJ6699, MW070989

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETA	GROSS BETA
RA226	RA-226
RA228	RA-228
SPEC	SPECIAL FORM FOR REPORTING

SAMPLE ID JJ6697, MW020989 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/29/89 Category 117387

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	35	27	pCi/l
GROSS BETA	<60		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/3/89	BETA: 12/1/89	
TOTAL ALPHA RADIUM	<5.0		pCi/l
PREPARED ON:	10/12/89	10/16/89	
COUNTED ON:	10/17/89		

SAMPLE ID JJ6698, MW030989 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/29/89 Category 117387

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<170		pCi/l
GROSS BETA	<140		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/3/89	BETA: 12/1/89	
TOTAL ALPHA RADIUM	<5.0		pCi/l
PREPARED ON:	10/12/89	10/16/89	
COUNTED ON:	10/17/89		

Received: 10/02/89

ITRSL Oak Ridge REPORT Work Order # R9-11-046
Results by Sample

SAMPLE ID JJ6699, MW070989 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/29/89 Category 117387

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	106	56	pCi/l
GROSS BETA	<60		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/3/89	BETA: 12/1/89	
TOTAL ALPHA RADIUM	<5.0		pCi/l
PREPARED ON:	10/12/89	10/16/89	
COUNTED ON:	10/17/89		

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED

NOV 14 1989

IT CORP. - ALBUQUERQUE

CERTIFICATE OF ANALYSIS

HOLLOMAN AFB-COE
IT CORPORATION
5301 CENTRAL AVE #700
ALBUQUERQUE, NM 87108
DANN MEYER

Date: 11/08/89

Work Order: A9-10-031 P.O. Number: AJS89137

This is the Certificate of Analysis for the following samples:

Client Work ID: WATER FOR POX 301251-02
Date Received: 10/06/89
Number of Samples: 12
Sample Type: WATER

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

PAGES	LABORATORY #	SAMPLE IDENTIFICATION	
2	A9-10-031-01	S-020989A	S-2
2	A9-10-031-02	S-040989A	S-4
2	A9-10-031-03	MW-010989A	MW-1
3	A9-10-031-04	MW-020989A	MW-2
3	A9-10-031-05	MW-030989A	MW-3
3	A9-10-031-06	MW-040989A	MW-4
4	A9-10-031-07	MW-050989A	MW-5
4	A9-10-031-08	MW-060989A	MW-6
4	A9-10-031-09	MW-070989A	MW-7
5	A9-10-031-10	MW-080989A	MW-8
5	A9-10-031-11	MW-110989A	MW-11
5	A9-10-031-12	MW-120989A	MW-12

Reviewed and Approved:

Donnie L. Heinrich
Laboratory Manager

Company: HOLLOMAN AFB-COE
Date: 11/08/89
Client Work ID: WATER FOR POX 301251-02

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684
Work Order: A9-10-031

SAMPLE ID	S-020989A	S-040989A	MW-010989A	
	S-2	S-4	MW-1	
SAMPLED	10/04/89	10/04/89	10/04/89	
TEST				UNITS
PURGEABLE ORG. HALOGENS	0.080	3.4	0.50	mg/L
	<0.05 mg/L		2.1 mg/L	
	0.090 mg/L		1.0 mg/L	
	<0.05 mg/L		4.1 mg/L	

Company: HOLLOMAN AFB-COE
Date: 11/08/89
Client Work ID: WATER FOR POX

301251-02

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684
Work Order: A9-10-031

SAMPLE ID	MW-020989A	MW-030989A	MW-040989A	
	MW-2	MW-3	MW-4	
SAMPLED	10/04/89	10/04/89	10/04/89	
TEST				UNITS
PURGEABLE ORG. HALOGENS	2.3	0.70	1.6	mg/L

Company: HOLLOMAN AFB-COE
Date: 11/08/89
Client Work ID: WATER FOR POX 301251-02

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684
Work Order: A9-10-031

SAMPLE ID	MW-050989A MW-5	MW-060989A MW-6	MW-070989A MW-7	
SAMPLED	10/05/89	10/04/89	10/05/89	
TEST				UNITS
PURGEABLE ORG. HALOGENS	0.50	4.4	<0.05	mg/L

582 · 39

Company: HOLLOMAN AFB-COE
Date: 11/08/89
Client Work ID: WATER FOR POX 301251-02

IT ANALYTICAL SERVICES
AUSTIN, TX
(512) 892-6684
Work Order: A9-10-031

SAMPLE ID	MW-080989A MW-8	MW-110989A MW-11	MW-120989A MW-12	
SAMPLED	10/05/89	10/04/89	10/04/89	
TEST				UNITS
PURGEABLE ORG. HALOGENS	1.1	<0.05	<0.05	mg/L

TEST CODE **POX** TEST NAME **PURGEABLE ORG. HALOGENS**

Method not available.

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NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

RECEIVED
OCT 03 1989
IT CORP. - ALBUQUERQUE

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name: Otero	Date received: 9-27-89 / Time received: 410
Date collected: 9.27 89	Time collected: 1030	Collected by	Lab. No.: 9221
Collection point: MW-012989		Disinfecting System ☐ Yes ☐ No	
System owner: Holloman AFB		RESIDUAL mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other

WSS Code No.

☐ Routine ☒ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*

☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)		/100 ml

Negative Control | Noncoliforms 50 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst: Sharon Smith | Date reported: 9-28-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

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OCT 03 1989
IT CORP. - ALBUQUERQUE

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name: Otero	Date received: 9-27-89 / Time received: 410
Date collected: 9.27.89	Time collected: 1030	Collected by	Lab. No.: 9220
Collection point: MW-120989		Disinfecting System ☐ Yes ☐ No	
System owner: Holloman AFB		RESIDUAL mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No.

☐ Routine ☒ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*

☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)		/100 ml

Negative Control | Noncoliforms [illegible] /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst: Sharon Smith | Date reported: 9-25-89

NEW MEXICO STATE UNIVERSITY
Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

RECEIVED
OCT 03 1989
IT CORP.-ALBUQUERQUE

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

MICROBIOLOGICAL WATER REPORT

Type - Print with ball-point pen. *Please give full information to avoid report delay*

Water Supply System name		County name Otero	Date received 9-26-89 Time received 4:25
Date collected 9-26-89	Time collected	Collected by 1500	Lab No ~~9210~~ 9211
Collection point S-020989		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner Holloman AFB		RESIDUAL mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		POSITIVE TUBES (confirmed)	
	Total (mpn)		100 ml
	Total (mpn)		100 ml
	Total (mf)	<10	100 ml
	Fecal (mpn)		100 ml
	Fecal (mf)		100 ml

Negative Control | Noncoliforms >20000 100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst Sharon Smith | Date reported 9-27-89

NEW MEXICO STATE UNIVERSITY
Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

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OCT 03 1989
IT CORP.-ALBUQUERQUE

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

MICROBIOLOGICAL WATER REPORT

Type - Print with ball-point pen. *Please give full information to avoid report delay*

Water Supply System name		County name Otero	Date received 9-28-89 Time received 12:15
Date collected	Time collected 0905	Collected by	Lab No. 9231
Collection point MW-02-0989		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner Holloman AFB		RESIDUAL mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		POSITIVE TUBES (confirmed)	
	Total (mpn)		100 ml
	Total (mpn)		100 ml
	Total (mf)	<10	100 ml
	Fecal (mpn)		100 ml
	Fecal (mf)		100 ml

Negative Control | Noncoliforms [illegible] 100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst Sharon Smith | Date reported 9-28-89

NEW MEXICO STATE UNIVERSITY
Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

RECEIVED
OCT 03 1989

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

IT CORP.-ALBUQUERQUE

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	Date received 9-28-89 / Time received 12 12
Date collected 9-28-89	Time collected 0900	Collected by	Lab. No. 9232
Collection point MW-030989		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner Holloman AFB		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		100 ml
Total (mf)	<100	100 ml
Fecal (mpn)		100 ml
Fecal (mf)		100 ml

Negative Control | Noncoliforms 75 100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst Sharon Smith | Date reported

NEW MEXICO STATE UNIVERSITY
Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

RECEIVED
OCT 03 1989

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

IT CORP.-ALBUQUERQUE

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	Date received 9-26-89 / Time received 4:25
Date collected 9-26-89	Time collected 1400	Collected by	Lab. No. 9212
Collection point MW-040989		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner Holloman AFB		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		100 ml
Total (mf)	<10	100 ml
Fecal (mpn)		100 ml
Fecal (mf)		100 ml

Negative Control | Noncoliforms 200 100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst Sharon Smith | Date reported

NEW MEXICO STATE UNIVERSITY
Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

RECEIVED
OCT 03 1989
JT CORP. - ALBUQUERQUE

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name: Otero	Date received: 9-27-89 / Time received: 4:10
Date collected: 9-27-89	Time collected: 1430	Collected by	Lab No: 9222
Collection point: MW-050989		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner: Holloman		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)		/100 ml

Negative Control | Noncoliforms 30 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst: Sharon Smith | Date reported: 9-28-89

NEW MEXICO STATE UNIVERSITY
Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

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OCT 03 1989

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name: Otero	Date received: 9-26-89 / Time received: 4:25
Date collected	Time collected: 1215	Collected by	Lab. No: 9213
Collection point: MW-060989		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner: Holloman AFB		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		100 ml
Fecal (mf)		/100 ml

Negative Control | Noncoliforms 970 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst: Sharon Smith | Date reported: 9-27-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

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OCT 03 1989

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

IT CORP. - ALBUQUERQUE

Type - Print with ball-point pen — *Please give full information to avoid report delay.*

Water Supply System name		County name: Otero	Date received: 9-27-89 — Time received: 410
Date collected: 9-27-89	Time collected: 1030	Collected by	Lab No.: 9224
Collection point: MW-070989		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner: Holloman AFB		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	≥ 20	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)		/100 ml

Negative Control — Noncoliforms 12000 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst: Sharon Smith — Date reported: 9-28-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

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OCT 03 1989

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

IT CORP. - ALBUQUERQUE

Type - Print with ball-point pen — *Please give full information to avoid report delay.*

Water Supply System name		County name: Otero	Date received: 9-27-89 — Time received: 410
Date collected: 9-27-89	Time collected: 1300	Collected by	Lab. No.: 9223
Collection point: MW080989		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner: Holloman AFB		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)		/100 ml

Negative Control — Noncoliforms 440 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst: Sharon Smith — Date reported: 9-25-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

RECEIVED
OCT 03 1989

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS. OLD

MICROBIOLOGICAL WATER REPORT

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: Unfinanational Tech. Corp.	County name: Otero
Date collected: 9-26-89	Time collected: 10.40
Collected by: A. Houska	
Collection point: S-040989	Disinfecting System ☐ Yes ☐ No
System owner: Holloman AFB	RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☒ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☒ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*

☐ Potability - Coliform Group ☐ Other - *specify:*
☒ Fecal Coliform

SEND REPORT to the following (Name and Address)

Date received: 9-26-89	Time received: 4.25
Lab. No. 9210	

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
	Total (mpn)	POSITIVE TUBES (confirmed)
	Total (mpn)	/100 ml
	Total (mf)	<10 /100 ml
	Fecal (mpn)	/100 ml
	Fecal (mf)	/100 ml

Negative Control | Noncoliforms 360 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

Analyst: Sharon Smith | Date reported: 9-27-89

APPENDIX E

CONFIRMATION NOTICE

Project No. 301251.02

From: D. Meyer
IT Corporation
Albuquerque, NM
505-262-8800

To: B. Stewart
U. S. Army Corps of Engineers
Omaha District
Omaha, NE
402-221-7807 (fax)

Confirmation Notice

Subject: Resampling Holloman AFB Monitoring Wells for POX

Following the last round of sampling, IT-Austin Analytical Laboratory informed me that the sample bottles they gave us were wrong for the POX analysis. I propose:

1. Send the field geologist and one technician to Holloman to obtain correct samples; this will occur October 3-4, 1989
2. Rebail five well volumes based on the well measurements obtained the previous week
3. Collect only POX samples in correct containers
4. Notify each affected laboratory of forthcoming samples.

Please notify me as soon as possible if this is acceptable. I would like to send my sampling team out early tomorrow.

APPENDIX F

A-E DAILY QUALITY CONTROL REPORTS

Date: 9/25/89

Sheet No.: 001

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 2nd monthly ground water monitoring

Weather: clear sunny, light breeze, hot PM, cool AM

Work Performed: collect gear/materials at shed; decon sampling equip, HNu and water levels at 10 monitoring wells; check all field meters for function/calibration

Sampling Performed: none

Problems and Corrective Actions: rusted lock at MW-1; will be replaced.

Quality Control Activities Initiated: calibrate interface probe and HNu PID prior to and after field activities; checked all field equipment for function and ability to calibrate (will redo daily)

Signature: [signature] IT Corp

Date: 7/26/89

Sheet No.: 002

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 2nd monthly ground water sampling & analysis

Weather: clear, sunny, hot PM, cool AM

Work Performed: calibrate field instr, bail and sample MW-06, S-4, MW-04, & S-2; decon ~~&~~ sampling gear; complete chain of custody forms, send samples off site to Knoxville, Austin, Las Cruces

Sampling Performed: ground water at MW-06, S-4, MW-04, S-2

Problems and Corrective Actions: verify YSI SCT meter is >10% low in accuracy check; meter will be used during well purge, only*; field measurement will use Cole-Parmer, only.

*if used at all

Quality Control Activities Initiated: daily instrument calibration prior and at end of work day; chain of custody program initiated

Signature: Dawn Meyer IT Corp - Albuquerque

Date: 9/27/89

Sheet No.: 003

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 2nd monthly groundwater sampling + analysis

Weather: clear, sunny, warm PM

Work Performed: sample 4 monitoring wells, instrument calibration, all samples couriered offsite via FedEx

Sampling Performed: wells MW-01 + duplicate + QA lab samples; MW-07; MW-08 + ~~duplicate~~ QA lab sample; MW-05

Problems and Corrective Actions: 1) YSI SCT meter removed from use because accuracy check consistently in excess of 10% error; 2) notified via Albq office that a POX sample was received at Austin broken: will check tomorrow AM if resampling is necessary

Quality Control Activities Initiated: collected 2 QA samples (MW-01, MW-08) for MRD Lab; duplicate collected at MW-01 (sample # MW-~~0~~120989)

Signature: Dawn Meyer

Date: 9/29/89

Sheet No.: 005

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 2nd monthly ground water sampling + analysis

Weather: not applicable

Work Performed: not applicable

Sampling Performed: not applicable

Problems and Corrective Actions: Austin lab informed me they sent us wrong bottles for POX; volume collected on this round is insufficient; I asked 1) they check correct volume; 2) send correct containers including 4 replicates for upgradient wells (MW-01, S-2). Ann Houska and John Boyd will return to HAFB on Oct 4-5, 1989 to collect POX samples

Quality Control Activities Initiated: N/A

Signature: [signature]

Date: 100489

Sheet No.: 1 of 1

CC4

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: (Project No. 301251.02) COE - Holloman Air Force Base, New Mex

Weather: Sunny and hot. Storm clouds and wind building [illegible]

Work Performed: RCRA GW Sampling at Holloman AFB, Wastewater Treatment Lagoons.

Sampling Performed: 2nd Quarterly GW Sample round. Resampling of POX parameter at all monitor wells. The monitor wells had 5 casing volumes purged prior to sample collection.

Problems and Corrective Actions: Minor difficulties with the monitor well's locks. They will require replacement in the near future.

Quality Control Activities Initiated: A Trip blank, one environmental duplicate and two quality assurance (for analysis at Missouri River Div. Laboratory) samples were collected. Samples were maintained under full Chain of custody procedures

Signature: Ann M. Houska, IT Corp.

THIRD MONTHLY
GROUND WATER SAMPLING REPORT
NOVEMBER 5 - NOVEMBER 8, 1989
HOLLOMAN AIR FORCE BASE, NEW MEXICO

Prepared for:

HQ TAC/DEEV
Langley AFB, Virginia 23665-5542

Under Contract with:

U.S. Army Corps of Engineers, Omaha District
215 North 17th Street, CEMO-ED-EB
Omaha, Nebraska 68102-4978

Prepared by:

International Technology Corporation
5301 Central Avenue N.E., Suite 700
Albuquerque, New Mexico 87108

May 1990

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APPENDIX C - SAMPLE CHAIN-OF-CUSTODY DOCUMENTATION

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APPENDIX E - CONFIRMATION NOTICE

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2	Concentrations of EPA Interim Primary Drinking Water Standards, Sewage Treatment Lagoons Monitoring Wells, Holloman Air Force Base, New Mexico, November 1989
3	Concentrations of Ground Water Quality Parameters, Sewage Treatment Lagoons Monitoring Wells, Holloman Air Force Base, New Mexico, November 1989
4	Concentrations of Ground Water Contamination Indicator Parameters, Sewage Treatment Lagoons Monitoring Wells, Holloman Air Force Base, New Mexico, November 1989
5	Method Detection Limits, Sewage Treatment Lagoons Monitoring Wells, Holloman Air Force Base, New Mexico, November 1989

1.0 INTRODUCTION

International Technology Corporation (IT) is the prime Architect-Engineer (A-E) contracted by the U.S. Army Corps of Engineers, Omaha District, to implement a Resource Conservation and Recovery Act (RCRA) Ground Water Monitoring Program (described in Code of Federal Regulations Title 40, Part 265 [40 CFR 265]) at the sewage lagoons and Lakes Holloman and Stinky, Holloman Air Force Base, New Mexico. The ground water monitoring program is being performed under Contract No. DACW45-88-D-0008 and in accordance with the 22 December 1989 signed Federal Facility Compliance Agreement (FFCA) between Holloman Air Force Base, the New Mexico Environmental Improvement Division, and the U.S. Environmental Protection Agency, Region VI. As part of the ground water monitoring program, monitoring wells are being sampled at approximately monthly intervals for a total of four sampling rounds. The first round of sampling was performed in August, 1989, by Radian Corporation, Austin, Texas. This report describes the results of the third round of ground water sampling activities conducted at the Holloman Air Force Base sewage treatment lagoons during the period November 5 through 8, 1989. This schedule is an acceleration of the RCRA ground water monitoring program described in 40 CFR 265, Subpart F, to establish background concentrations for ground water parameters. RCRA ground water monitoring, as modified has been followed to meet the requirements of the FFCA. Ground water sampling was conducted in accordance with the Architect Engineer Safety, Health and Emergency Response Plan (A-E SHERP) (IT, 1989a) and the Architect-Engineer Quality Control Plan/Sampling Plan for Groundwater Study and Monitoring Program, Holloman Air Force Base, New Mexico (A-E QCP/SP) (IT, 1989b). The A-E QCP SP is based on the Hydrogeologic Investigation Report and Groundwater Monitoring Plan for the Sewage Treatment Lagoons, Holloman Air Force Base, NM 88330 (Radian, 1989). The ground water monitoring plan was approved by the EPA in 1989.

In accordance with the ground water monitoring requirements of 40 CFR 265.92(b)(1), samples were collected and analyzed for concentrations of those parameters characterizing the suitability of the ground water as a drinking water supply (40 CFR 265, Appendix III). Concentrations of constituents characterizing ground water quality [40 CFR 265.92(b)(2)] and ground water contamination indicator parameters [40 CFR 265.92(b)(3)] were also determined

in the samples. Descriptions of field methods employed and a discussion of analytical and quality control results are provided below. Job logs documenting daily field activities are presented in Appendix A.

2.0 FIELD METHODS AND MEASUREMENTS

Field measurements made prior to ground water sample collection determined the presence or absence of organic vapors and nonaqueous phase liquids in the wells, well water-levels, and total well depths. This information led to calculation of well-bore water volumes, the volumes of water to be purged prior to well sampling, and the frequency of field pH and specific conductance measurements taken during well purging. Data forms documenting field measurement activities are provided in Appendix B.

2.1 ORGANIC VAPOR DETECTION

The presence of organic vapors in a well-bore atmosphere can be an indicator of nonaqueous phase liquids possibly being present in the well. Prior to measuring water levels in each well, the well head atmosphere was analyzed for organic vapors using a calibrated Hnu PI-101 field photoionization detector with a 10.2-eV lamp. Calibration of the Hnu instrument was accomplished using a standard reference gas (100 ppm isobutylene/air) prior to analyzing any well head atmospheres. Additionally, a background organic vapor concentration value was measured at each well location by sampling the atmosphere at large. Then, immediately after opening the monitor well cap, the detector was inserted into the well casing and the organic vapor content was measured. Well head organic vapor concentrations ranged from not detectable to 0.1 parts per million (ppm) in the Holloman monitoring wells. All well head organic vapor measurement values were less than on-site background values. The low concentrations of measurable organic vapors in the well head atmospheres and the fact that all of the well head organic vapor values were less than background indicated a probable absence of nonaqueous phase liquids in the wells.

2.2 WATER LEVEL, TOTAL DEPTH, AND IMMISCIBLE ORGANIC LAYER DETERMINATIONS

Water level, total well depth, and the location or absence of immiscible organic layers were determined by measurement from surveyed points indicated on the tops of the well casings. An

ORS interface probe, calibrated using a steel surveyor's tape, was used to measure the distances between top of casing and both water surface and well bottom. The ORS probe creates a steady tone when water is encountered and a broken tone when encountering immiscible layers either less dense or denser than water. Immiscible layers were not detected in any of the monitoring wells. Results of the water level and total well depth measurements, as well as calculated well volumes and sampling purge volumes, are listed in Table 1.

2.3 WELL EVACUATION

Well evacuation and ground water sampling were performed following procedures in the A-E QCP/SP. New protective clothing was donned by site personnel and nondedicated sampling equipment was decontaminated using nonphosphate detergent wash, tap water rinse, deionized water rinse, methanol and hexane rinses prior to actual well evacuations. Dedicated 1-1/2 inch diameter teflon bailers with stainless steel leaders attached to polypropylene ropes were used to purge and sample the wells. Approximately five well volumes of water were purged from the wells with five to seven measurements of pH, specific conductance, and temperature being recorded at intervals during bailing. Water bailed from well MW-1 appeared nearly clear for the first few bails, then became turbid but cleared slightly just prior to sampling. A slight greenish hue and an absence of particulates was noted in the bails from the remaining wells. Field notes describing the well evacuations are contained in Appendix B. Following the purge of approximately five well volumes of water from each monitoring well, collection of ground water samples began.

2.4 GROUND WATER SAMPLING

The monitor wells were sampled upon completion of the purging criteria. The wells sampled include the upgradient wells MW-1 and S-2, and downgradient wells MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and S-4. Quality assurance samples were also collected during this November, 1989, sampling episode. These samples included a blind field duplicate sample collected at well S-2 and identified as well MW-12, two duplicate quality assurance sample collected at wells MW-1 and MW-8 which were forwarded to the U.S. Army Corps of Engineers, Missouri River Division Laboratory, Omaha, Nebraska, for independent analysis, and a trip blank sample for purgeable organic halides (POX) identified as well MW-11. Concentrations of

analytes which were sampled in each of the wells are listed in the tables of analytical results (Tables 2, 3, and 4).

Field Measurements

The parameters specific conductance, pH, and temperature were measured in the field during well purging, and before and after each sampling sequence. Specific conductance was determined using a Cole-Palmer model 1481-60 conductance meter in automatic temperature compensation mode. This meter is capable of determining the specific conductance of ground water over a wide range of values. This proved necessary to measure specific conductance of ground water from the Holloman sewage lagoon monitoring wells. All specific conductance measurements were made using the meter's 0 to 200,000 micromohs per centimeter (μ mhos/cm) scale. The meter was calibrated daily by standard solution at the scale midpoint. pH was determined using an Orion SA-250 meter, calibrated daily. Temperature was determined using a mercury in glass thermometer. These field measurements were recorded on the field sampling data sheets located in Appendix B. Specific conductance and pH measurements are also summarized in Table 4.

Sample Collection

Ground water samples were obtained from each well by carefully pouring from the dedicated teflon bailers. All samples were poured directly into prepared sampling containers. There were no field filtrations of samples. Clean surgical gloves were donned immediately prior to sample collection, and again immediately prior to collection of bacteriological samples. Ground water samples were collected for analysis in the following order:

Purgeable organic halides (POX)
Total organic carbon (TOC)
Pesticides
Herbicides
Metals
Phenolics
General chemistry (anions)
Nitrate and nitrite
Radiochemistry
Coliform bacteria.

Sample Containers and Preservatives

Sample collection containers were supplied by the International Technology Analytical Services (ITAS) laboratories in Austin, Texas, and Middlebrook (Knoxville), Tennessee. Appropriate sample preservatives were added to the containers at the laboratory prior to shipment.

2.5 SAMPLE HANDLING AND SHIPMENT

All samples were isolated in sealable plastic bags and placed on ice in a shipping cooler immediately after collection. Samples were shipped by overnight carrier in a sealed shipping container with complete chain-of-custody documentation to the ITAS laboratories in Middlebrook (Knoxville), Tennessee and Austin, Texas, and to the U.S. Army Corps of Engineers, Missouri River Division Laboratory in Omaha, Nebraska. Samples for total organic carbon (TOC) and radiochemistry analyses were forwarded by ITAS Middlebrook (Knoxville) laboratory to the ITAS laboratory in Oak Ridge, Tennessee, for analysis. Additionally, ITAS Middlebrook (Knoxville), Tennessee, provided splits of the metals analysis samples to the ITAS laboratory in Cincinnati, Ohio, for analysis of arsenic and selenium by alternative EPA methods 206.5, 206.3, and 270.3. Samples for purgeable organic halide analysis (POX) were forwarded by ITAS Austin, Texas, to Radian Corporation, also in Austin, Texas, for analysis. Bacteriological samples were hand-carried with chain-of-custody documentation to the Soil, Water, and Plant Testing Laboratory, New Mexico State University, Las Cruces, New Mexico, for analysis. Chain-of-custody documentation for all samples are located in Appendix C.

3.0 ANALYTICAL RESULTS

Samples from each of the wells were analyzed for the parameters listed in the U.S. Environmental Protection Agency (EPA) Interim Primary Drinking Water Standards, ground water quality indicator parameters, and ground water contamination indicator parameters. Laboratory analytical reports containing analytical results, quality control results, and method detection limits are presented in Appendix D. Summaries of analytical results are presented in Tables 2, 3, and 4.

3.1 METHOD DETECTION LIMITS

Method detection limits (MDL) actually achieved by the analytical laboratories during analyses of the November, 1989, samples are listed in Table 5. All primary drinking water parameters were analyzed at MDLs equal to or less than the associated maximum contaminant levels with the exceptions of gross alpha and gross beta activities, and coliform bacteria. Samples for the radiochemistry analyses, gross alpha and gross beta activities, could not be analyzed at MDLs less than the associated maximum contaminant levels because of the high dissolved solids concentrations in the samples.

Eight out of ten samples for coliform bacteria could not be analyzed at MDLs of 1 colony per 100 milliliters (ml) of sample due to excessive numbers of noncoliform bacteria present in the samples. All samples were analyzed by the New Mexico State University laboratory in triplicate, at as-received concentration, at a 10 times dilution, and at a 100 times dilution. Bacterial counting was performed on the least possible dilution. Analytical results reported in Table 2 reflect the minimum sample dilution at which laboratory personnel could enumerate bacterial colonies. Table values reported as less than 10 colonies per 100 ml, for example, indicate that the laboratory did not identify any coliform colonies in the sample at a 10 times sample dilution.

Excessive growth of noncoliform bacteria in the incubated samples and sample dilutions made accurate enumeration of coliforms difficult. Since method detection limits could not be achieved and estimates for method precision and accuracy are unavailable, the usefulness of these data for assessing the impacts of the sewage lagoons on local ground water conditions is doubtful. Coliform bacteria concentration is an indicator of drinking water quality, not potential RCRA hazardous waste components in ground water. The effort of the unlined sewage treatment lagoons at Holloman Air Force Base on local coliform concentrations in ground water is predictable but unlikely to be significant with regard to RCRA hazardous wastes from the lagoons.

3.2 PRIMARY DRINKING WATER STANDARDS

Concentrations of analytes listed as EPA Interim Primary Drinking Water Standards and their associated maximum contaminant levels are located in Table 2. All parameter concentrations were reported either less than or, within the range of maximum contaminant levels, with the following exceptions:

- Fluoride concentrations in samples from wells MW-4, MW-6, MW-8, and S-4 were less than the 1.4 milligram per liter (mg/l) minimum concentration standard. Fluoride concentration in the sample from well S-2 (4.1 mg/l) exceeded the maximum contaminant level standard (2.4 mg/l) for drinking water.

- Nitrate concentration in the sample from well S-4 was reported at 33 mg/l, exceeding the maximum contaminant level of 10 mg/l.

- Except for samples from wells MW-4 and MW-6, coliform bacteria in all other samples were reported as not detectable at MDLs exceeding the maximum contaminant level.

- Gross alpha activities exceeding the 15 pCi/l maximum contaminant level were reported in the dissolved sample fractions from wells S-2 [176 (70) pCi/l], MW-5 [65 (49) pCi/l] and MW-7 [254 (80) pCi/l]. Values in parentheses represent on error range of plus or minus two standard deviations.

3.3 GROUND WATER QUALITY PARAMETERS

Analytical results for parameters indicating ground water quality including chloride, sodium, sulfate, iron, manganese, and phenols are listed in Table 3. While samples from the Holloman Air Force Base monitoring wells are generally typified as high in dissolved solids content, there are wide variations in major analyte concentrations from well to well. The lowest chloride concentrations were reported in the 1,000 to 2,000 mg/l range (one to two grams per liter) in samples from wells S-2 (upgradient), MW-2, and MW-7 (both downgradient). Samples from wells MW-3, MW-4, MW-5, and MW-8 were reported having chloride concentrations between 2,000 and 5,000 mg/l. The greatest chloride concentrations were reported in samples from wells MW-1 (upgradient), MW-6 and S-4 (both downgradient), ranging from 31,000 to 48,000 mg/l. Sodium concentrations in the well samples followed the same general trend established by the chloride concentrations. Well samples exhibiting low chloride concentrations also exhibited low sodium concentrations. The corollary appears true for samples exhibiting high chloride concentrations. Sulfate concentrations ranged between 2,200 (MW-2) and 5,400 (S-4) mg/l in the well samples. Concentration values for iron ranged from 119 (MW-6) to 962 (MW-3) μ g/l. Manganese concentrations were lowest in the two upgradient wells MW-1 and S-2, and the downgradient well S-4, ranging from 7 to 135 μ g/l. Manganese concentrations in the remaining downgradient wells ranged from 440 (MW-4) to 2,030 (MW-5) μ g/l. Phenols were not detected in any of the samples at a MDL of 0.01 mg/l except for the sample from well MW-6, where phenols were reported near the detection limit at 0.03 mg/l.

3.4 CONTAMINATION INDICATOR PARAMETERS

Concentrations of the ground water contamination indicator parameters (pH, specific conductance, total organic carbon, and purgeable organic halides) for samples from the Holloman Air Force Base monitor wells are listed in Table 4. Four replicate measurements of each contamination indicator parameter are reported for the upgradient wells MW-1 and S-2. pH values measured in the field after sampling ranged from 6.74 to 7.31 pH units. Specific conductance, also measured in the field, ranged from 5,200 to 96,500 μ mhos/cm at 25°C. All specific conductance measurements were made using a conductivity meter set on a 0 to 200,000 μ mhos/cm scale. Total organic carbon analytical results were distributed between not detectable at a MDL of 1 mg/l and 20.1 mg/l across the Holloman well samples. Results for analyses of purgeable organic halides (POX) on the well samples are also reported in Table 4. Concentration values for POX ranged from not detectable at 0.024 mg/l as chloride to 0.22 mg/l as chloride.

4.0 QUALITY CONTROL

Quality control (QC) samples were collected during the November, 1989, sampling effort for analysis in accordance with the procedures specified in the A-E QCP/SP. Environmental duplicate samples and purgeable organic halide trip blank samples were collected.

Duplicate samples from wells MW-1 and MW-8 were collected and transmitted to the U.S. Army Corps of Engineers, Missouri River Division Laboratory in Omaha, Nebraska for independent analysis. An additional blind duplicate field sample was collected at well S-2 and submitted to the ITAS and New Mexico State University laboratories for analysis. This blind duplicate sample is identified in Tables 2, 3, and 4 as well number MW-12, where the analytical results are listed along with the results for the S-2 sample analyses. Each duplicate sample fraction was collected from a new bail of ground water immediately after collecting the sample fraction in order to minimize variabilities due to time or sampling mechanics.

A purgeable organic halide (POX) trip blank sample was prepared at the IT-Albuquerque warehouse immediately prior to field personnel traveling to the sampling site, and was shipped to the analytical laboratory with the POX samples from the Holloman wells. The POX trip blank

sample was designated as well number MW-11. Results of the POX trip blank sample analysis are listed in Table 4, and indicate that no in-transit contamination of the samples occurred.

Laboratory quality control data are contained within the Certificates of Analyses, Appendix D. The ITAS Middlebrook (Knoxville) laboratory performed matrix spike and matrix spike duplicate analyses on sample MW-12 (MW-12 sample was a field duplicate of the samples collected at well S-2). Matrix spike recoveries exceeded control limits (75-125 percent) for iron (163.0 percent), lead (74.2 percent), manganese (661.4 percent), and silver (40.0 percent). A post-digest spike analysis was performed with these elements and resulted in xcceptable spike recoveries. Duplicate relative percent difference (RPD) values for iron (288 percent) and manganese (160.7 percent) exceeded control limits of ±20 percent RPD on the quality control analyses of sample MW-12. All quality control data which exceeded controls were flagged by the ITAS Middlebrook (Knoxville) laboratory as required in the EPA CLP Statement of Work (July 1987). All other quality control data reported by ITAS Middlebrook (Knoxville) were within control limits.

The arsenic and selenium values reported in Table 2 resulted from sample digestion and analysis by hydride generation (EPA Methods 206.5, 206.3, and 270.3) performed at the ITAS Cincinnati Laboratory. Matrix spike values for arsenic (63.0 percent) and selenium (68.7 percent) are less than expected accuracy of 75-125 percent spike recovery. However, method detection limits for these analyses were 0.3 μ g/l, significantly lower than the method detection limits previously achieved using graphite furnace atomic absorption (GFAA) methods.

The sample holding times specified in the A-E QCP/SP were met for all analyses with the exception of purgeable organic halides (POX). Samples for POX analysis were forwarded by the ITAS Austin laboratory to Radian Corporation, Austin, Texas, in time for Radian Corporation to complete the analyses within recommended sample holding times. See Appendix E, Confirmation Notice dated November 17, 1989. However, on November 21, 1989, Radian Corporation verbally notified IT Corporation project personnel that due to instrument failure, it was impossible to complete the POX analyses within sample holding times. See Appendix E,

Record of Telephone Call dated November 21, 1989. Project personnel advised Radian to analyze the samples for POX at their earliest convenience. On December 15, 1989, Radian Corporation verbally notified IT of problems encountered with the POX analyses. The problem was identified as incorrect sample preservation with sulfuric acid, which was corrected by careful neutralization of the samples prior to analysis. The POX analyses were finally completed 40 days after sample collection, exceeding the 14-day recommended holding times. Due to the difficulties encountered in analyzing the November, 1989, POX samples, comparability of these data with previous or subsequent sampling and analysis events cannot be assured.

Any nonconformance to sampling procedures established in the A-E QCP/SP were documented daily on an "A-E Daily Quality Control Report for Groundwater Monitoring at Holloman Air Force Base, New Mexico" form. These daily quality control reports are located in Appendix F.

5.0 REFERENCES

International Technology Corporation (IT), 1989a, "Safety, Health & Emergency Response Plan (A-E SHERP)," Ground Water Detection Monitoring Program," Holloman Air Force Base, New Mexico.

International Technology Corporation (IT), 1989b, "A-E Quality Control Plan and Sampling Plan (A-E QCP/SP) For Groundwater Study and Monitoring Program," Holloman Air Force Base, New Mexico.

Radian Corporation, 1989, "Hydrogeologic Investigation Report and Proposed Groundwater Monitoring Plan for the Sewage Treatment Lagoons, Holloman Air Force Base, NM 88330," Holloman Air Force Base, New Mexico.

TABLE 1

GROUND WATER ELEVATION AND WATER VOLUMES PURGED FROM THE SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO NOVEMBER 1989

MONITOR WELL	TOP OF[a] CASING ELEVATION (FAMSL)	DEPTH TO[b] GROUND WATER (FEET)	GROUND WATER ELEVATION (FAMSL)	TOTAL[b] DEPTH (FEET)	WELL VOLUME (GALLONS)	GALLONS DISCHARGED PRIOR TO SAMPLING	WELL VOLUMES DISCHARGED PRIOR TO SAMPLING
MW-1	4053.42	11.24	4042.18	17.81	4.3	22	5.1
S-2	4040.56	9.47	4031.09	20.24	1.8	9	5.0
MW-2	4039.78	6.04	4033.74	17.70	7.6	38	5.0
MW-3	4037.38	9.21	4028.17	17.71	5.5	28	5.1
MW-4	4030.30	6.41	4023.89	17.80	7.4	38	5.1
MW-5	4039.30	6.04	4033.26	17.72	7.6	38	5.0
MW-6	4031.21	8.13	4023.08	17.78	6.3	32	5.1
MW-7	4039.88	6.45	4033.43	17.69	7.3	37	5.1
MW-8	4040.50	6.95	4033.55	17.76	7.0	36	5.1
S-4	4034.46	9.52	4024.94	14.35	0.8	4	5.0

[a] A-E Groundwater Monitoring Report/Quality Control Summary for the First Groundwater Sampling Round Holloman Air Force Base, New Mexico, October 1989, Radian Corporation, Austin, TX.
[b] Reference from top of casing. Measured on November 5, 1989.

TABLE 2

CONCENTRATIONS OF EPA INTERIM PRIMARY DRINKING WATER STANDARDS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO NOVEMBER 1989

			MONITOR WELL					
PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	MW-1	S-2	MW-12 (DUPLICATE S-2)	MW-2	MW-3	MW-4
Arsenic	µ g/l	50	4.3	6.4	7.0	3.3	1.1	2.3
Barium	µ g/l	1000	45	11.7	11.7	28.3	17.4	17
Cadmium	µ g/l	10	5-U	5-U	5-U	6.8	5-U	5-U
Chromium	µ g/l	50	11	10-U	10-U	10-U	10-U	10-U
Fluoride	mg/l	1.4-2.4	1.5	4.1	3.8	1.4	1.5	0.7
Lead	µ g/l	50	30-U	30-U	30-U	30-U	30-U	11
Mercury	µ g/l	2	0.3	0.3-U	0.4-U	0.2-U	0.2-U	0.2-U
Nitrate (as N)	mg/l	10	3.8	3.4	3.4	0.05	0.05-U	0.08
Selenium	µ g/l	10	2.2	ND	ND	ND	ND	ND
Silver	µ g/l	50	5-U	5-U	5-U	5-U	5-U	5-U
Endrin	µ g/l	0.2	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Lindane	µ g/l	4	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Methoxychlor	µ g/l	100	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Toxaphene	µ g/l	5	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U
2,4-D	µ g/l	100	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U
2,4,5-TP Silvex	µ g/l	10	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Radium	pCi/l	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Gross Alpha[a]	pCi/l	15	<240	176(70)	<70	<60	<120	<143
Gross Beta[a]	pCi/l	4 millirem/yr[b]	<260	<65	<70	<50	<120	<100
Coliform Bacteria	col/100 ml	1/100 ml	<10	<100	<100	<100	<100	<1

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.
ND = Not detected. Lower limit of detection for selenium was 0.3 µ g/l.
[a] Values in parentheses represent an error range of ± two standard deviations.
[b] Refer to Code of Federal Regulations Title 40, Part 141.16 (40 CFR 141.16), for reference to relate analytical units (pCi/l) to maximum contaminant level (MCL).

TABLE 2

CONCENTRATIONS OF EPA INTERIM PRIMARY DRINKING WATER STANDARDS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO NOVEMBER 1989

(CONTINUED)

			MONITOR WELL				
PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	MW-5	MW-6	MW-7	MW-8	S-4
Arsenic	µ g/l	50	5.2	1.4	4.4	0.6	1.9
Barium	µ g/l	1000	29.1	33	23.0	21	22
Cadmium	µ g/l	10	5-U	5-U	5-U	5-U	5-U
Chromium	µ g/l	50	10-U	10-U	10-U	10-U	10-U
Fluoride	mg/l	1.4-2.4	2.3	0.9	2.3	0.8	0.9
Lead	µ g/l	50	30-U	30-U	30-U	5-U	15-U
Mercury	µ g/l	2	0.3-U	0.2-U	0.6	0.2-U	0.2-U
Nitrate (as N)	mg/l	10	0.05-U	2.7	0.05-U	0.05-U	33
Selenium	µ g/l	10	ND	3.5	ND	ND	7.4
Silver	µ g/l	50	5-U	5-U	5-U	5-U	5-U
Endrin	µ g/l	0.2	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Lindane	µ g/l	4	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Methoxychlor	µ g/l	100	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Toxaphene	µ g/l	5	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U
2,4-D	µ g/l	100	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U
2,4,5-TP Silvex	µ g/l	10	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Radium	pCi/l	5	<5.0	<5.0	<5.0	<5.0	<5.0
Gross Alpha[a]	pCi/l	15	65(49)	<775	254(80)	<85	<410
Gross Beta[a]	pCi/l	4 millirem/yr[b]	<80	<580	<60	174(80)	<350
Coliform Bacteria	col/100 ml	1/100 ml	<10	<1	<100	<10	<100

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.
ND = Not detected. Lower limit of detection for selenium was 0.3 µ g/l.
[a] Values in parentheses represent an error range of ± two standard deviations.
[b] Refer to Code of Federal Regulations Title 40, Part 141.16 (40 CFR 141.16), for reference to relate analytical units (pCi/l) to maximum contaminant level (MCL).

TABLE 3

CONCENTRATIONS OF GROUND WATER QUALITY PARAMETERS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO NOVEMBER 1989

		MONITOR WELL					
PARAMETER	UNITS	MW-1	S-2	MW-12 (DUPLICATE S-2)	MW-2	MW-3	MW-4
Chloride	mg/l	30,000	1,200	1,200	1,100	4,900	2,900
Iron	µ g/l	764	310	270	363	962	332
Manganese	µ g/l	33	135	133	877	1,540	440
Phenols	mg/l	0.01-U	0.01-U	0.01-U	0.01-U	0.01-U	0.01-U
Sodium	mg/l	7,660	779	789	529	2,419	1,640
Sulfate	mg/l	2,400	3,200	3,300	2,200	4,000	3,200

		MONITOR WELL				
PARAMETER	UNITS	MW-5	MW-6	MW-7	MW-8	S-4
Chloride	mg/l	3,300	48,000	1,100	3,200	31,000
Iron	µ g/l	874	119	183	144	273
Manganese	µ g/l	2,030	838	1,050	519	7
Phenols	mg/l	0.01-U	0.03	0.01-U	0.01-U	0.01-U
Sodium	mg/l	1,090	15,900	545	1,580	7,920
Sulfate	mg/l	2,400	5,100	2,300	3,200	5,400

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.

TABLE 4

CONCENTRATIONS OF GROUND WATER CONTAMINATION INDICATOR PARAMETERS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO NOVEMBER 1989

MONITOR WELL	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	TOTAL ORGANIC CARBON(1) (mg/l)	PURGEABLE ORGANIC HALIDES (mg/l as Cl)
MW-1	6.76	59,100	<1.00	0.14
	6.76	59,600	<1.00	0.13
	6.74	60,100	<1.00	0.12
	6.76	60,100	<1.00	0.13
S-2	7.22	8,900	6.71	<0.024
	7.28	8,400	7.13	<0.024
	7.30	8,500	7.02	<0.024
	7.31	8,400	7.02	<0.024
MW-12 (Duplicate S-2)	NA	NA	12.2	<0.024
MW-2	7.17	5,200	8.9	<0.024
MW-3	7.06	15,600	20.1	<0.024
MW-4	6.87	13,000	6.08	<0.024
MW-5	6.82	12,300	9.0	<0.024
MW-6	6.83	96,500	10.0	0.22
MW-7	6.97	6,000	4.63	<0.024
MW-8	6.97	10,800	2.23	<0.024
S-4	7.11	65,300	<1.00	0.13
MW-11 (trip blank)	NA	NA	NA	<0.024

NA = Not Applicable.

(1) Total organic carbon concentrations are blank corrected for any total organic carbon detected in the laboratory method blank samples. Blank corrections are consistent with previously reported data. In Appendix D, Certificates of Analyses, total organic carbon concentrations are not blank corrected.

TABLE 5

METHOD DETECTION LIMITS, SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO NOVEMBER 1989

PARAMETER	DETECTION LIMIT
TOC	1 mg/L
POX	0.024 mg/L
Chloride	0.5 mg/L
Sulfate	1.5 mg/L
Phenols	0.01 mg/L
Nitrate/Nitrite	0.05/0.01 mg/L
Fluoride	0.1 mg/L
Arsenic	0.3 μg/L
Lead	30 μg/L[a]
Mercury	0.2 μg/L
Selenium	0.3 μg/L
Iron	50 μg/L
Manganese	2 μg/L
Sodium	200 μg/L
Barium	2 μg/L
Cadmium	5 μg/L
Chromium	10 μg/L
Silver	5 μg/L
Endrin	0.1 μg/L
Lindane	0.1 μg/L
Methoxychlor	0.1 μg/L
Toxaphene	0.5 μg/L
2,4-D	1.2 μg/L
2,4,5-TP (Silvex)	0.1 μg/L
Radium	5.0 pCi/l
Gross Alpha	775 pCi/l[a]
Gross Beta	580 pCi/l[a]
Coliform Bacteria	<100/100 mL[a]

[a] Detection limits are variable and sample specific. Value reported is the maximum limit of detection reported for any individual sample. Detection limits for most samples are less than table value.

APPENDIX A

JOB LOGS

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE

DATE Sunday 110587

LOCATION Holloman AFB, Alamogordo, NM

JOB NUMBER 301251.02

WORK PERFORMED Wastewater Treatment Lagoons – GW Sample Collection

PREPARED BY A. Houska

SUPERVISOR D. Meyer

CLASS	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc	A Houska	0830	1435	—	1750	1815	9.75
APSc	M. Lyon	0830	1435	—	1750	1815	9.75
Tech	J. Boyd	0830	1435	—	1750	1815	9.75

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
1 day	HNu PID				
1 day	CRS Interface Probe				
1/4 bx	Surgical gloves				
1 day	decon equipment				
2 each	vehicles				

TIME	FIELD ACTIVITY DAILY LOG
0830	Meet at IT Warehouse; Pick up rental vehicles, Load gear;
1000	Drive to Holloman AFB, Alamogordo, NM Pour trip blank.
1420	Check in at HAFB.
1435	Drive to WWT area. Calibrate Equipment. Conduct fluid-
	level measurements, headspace readings (photoionization detector)
	and total well depth measurements at all ten wells.
1735	Complete measurements. Re calibrate equipment.
1750	Leave HAFB. Drive to motel; ~~Check In~~
1815	Check in motel + unload gear.
	Stop.

COMPLETE ONE SHEET FOR EACH SHIFT

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

Monday

COMPANY COE - HAFB

DATE 11 06 87

LOCATION Wastewater Treatment Lagoons

JOB NUMBER 30125[illegible]

WORK PERFORMED RCRA

PREPARED BY A. Houska

SUPERVISOR D Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc	A. Houska	0700	0800	—	1610	1630	9.5
APSc	M Lyon	0700	0800	—	1245	1630	9.5
Tech	J. Boyd	0700	0800	—	1610	1630	9.5

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
1 each	pH meter	1/8 roll	visqueen		
1 each	thermometer	6	tyvek suits		
1 each	S conduct. meter	12 bags	ice		
3 ~~each day~~	Sample collection equip.	2 each	vehicles		
1 day	decon equipment	3 pr.	nitrile		
1/2 Bag	vermiculite	1/2 BX	Surgical gloves		

TIME	FIELD ACTIVITY DAILY LOG
0700	Pack gear, calibrate equipment, buy ice, drive to ~~WWT Area~~ ~~Arrive~~ MW-06.
0800	Arrive at MW-06
0800	Set-up, purge well and sample MW-06.
0950	Set-up, purge well and sample S-4.
1130	Set-up purge well and sample MW-04.
1245	Complete sampling M. Lyons drives samples to Las Cruces (for Coliform bacteria analysis). A. Houska, J. Boyd purchase sample supplies & package samples for shipment
1600	Federal Express picks up sample coolers at WWT area.
1610	A. Houska, J. Boyd leave HAFB, return to motel, unload gear
1630	M. Lyon arrives from Las Cruces. STOP

COMPLETE ONE SHEET FOR EACH SHIFT

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

Tuesday

COMPANY COE

DATE 11/07/89

LOCATION Holloman AFB, Alamogordo, NM

JOB NUMBER 30126102

WORK PERFORMED RCRA GW sampling at Wastewater Treatment lagoons

PREPARED BY A. Houska

SUPERVISOR D. Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc	A. Houska	0630	0710	—	1615	1630	10 hrs
APSc	M. Lyon	0630	0710	—	1440	1815	11 hrs
Tech	J. Boyd	0630	0710	—	1615	1630	10 hrs

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
5 Each	Sample collection Equipment			14 bags	ice
1 day	pH meter	1 Bx	surgical gloves		
1 day	thermometer	4 pr.	nitrile gloves		
1 day	S. Cond. meter	1 3/4 bag	vermiculite		
10 pr.	tyvek	2	vehicles		
1/4 roll	visqueen	1 day	Decon Equipment		

FIELD ACTIVITY DAILY LOG

TIME	
0630	Calibrate Equipment, load gear + drive to HAFB. Stop + buy ice.
0710	Arrive at WWT area. Unload gear + prep for sampling.
0720	Arrive at MW-03. Set up, purge well + collect samples
0845	Set up on MW-02, purge well + collect samples.
1035	MW-02 complete.
1050	Return to MW-03 to collect Coliform sample. MW-03 complete.
1110	Set up on MW-05, purge well + collect Samples.
1220	Set up on MW-07, purge well + collect Samples.
1335	Set up on S-2, purge well + collect samples. Duplicate sample collected at this well.
1440	M. Lyon leaves to deliver coliform bact. samples to lab in Las Cruces
1455	Leave S-2. Return to shed, pack coolers.
1600	FedX pickup of packages.

COMPLETE ONE SHEET FOR EACH SHIFT

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE HAFB

DATE 110789

LOCATION

JOB NUMBER 3012-01-67

WORK PERFORMED See Page 1

PREPARED BY

SUPERVISOR

CLASS	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT

FIELD ACTIVITY DAILY LOG

TIME	
1615	Leave WWT area, return to hotel; Unload gear
1630	Stop (A. Houska + J. Boyd)
1745	M. Lyon arrives back from L. Cruces. STOP.

COMPLETE ONE SHEET FOR EACH SHIFT

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE- Holloman AFB DATE Wednesday 110887

LOCATION wastewater Treatment Lagoons JOB NUMBER 30125[illegible]

WORK PERFORMED RCRA gw sample collection.

PREPARED BY A Houska SUPERVISOR D. Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc	A. Houska	0700	0725	—	1340	1830	11.5 hrs
APSc	M. Lyon	0700	0725	—	1340	1730	10.5 hrs
Tech	J. Boyd	0700	0725	—	1340	1730	10.5 hrs

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT
2 each	Sample coll. equipment.	1/4 Bx	Surgical boxes	2 each	vehicles
1 day	pH meter	7 bags	Ice		
1 day	thermometer		~~nitrite~~		
1 day	S conductivitymeter	1/4 bx	Surgical gloves		
4 each	tyvek	1/2 bg	vermiculite		
1/8 rll	visqueen	1 day	decon equipment		

FIELD ACTIVITY DAILY LOG

TIME	
0700	Load gear, calibrate equipment, check out of motel; Drive to HAFB. Purchase ice on route.
0725	Arrive at WWT area. Get equipment.
0735	Set up on MW-8. Purge well. Collect gw sample plus sample for QA lab.
0920	Set up on MW-1. Purge well. Collect gw sample (4 replicates for POC + TOX) and samples for QA lab.
1110	Return to WWT area, pack samples, load gear
1305	Leave WWT area. A Houska telephones labs, J. Boyd + M. Lyon replace locks on MW-06 and MW-4.
1340	IT leaves HAFB. A. Houska delivers samples to lab in Las Cruces. J. Boyd + M. Lyon drive to Albuquerque.
1405	A Houska drops off samples in Las Cruces + begins drive to Albuquerque.
1700	J. Boyd + M. Lyon arrive IT-warehouse, deliver sample cooler

COMPLETE ONE SHEET FOR EACH SHIFT

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY CCE- Holloman AFB

DATE 110887

LOCATION

JOB NUMBER 30125 1.02 13

WORK PERFORMED See Page 1

PREPARED BY

SUPERVISOR

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL

AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT	AMT / HRS.	MATERIAL EQUIPMENT

FIELD ACTIVITY DAILY LOG

TIME	
	to Jed X and unload gear.
1730	J. Boyd + M. Lyon Stop.
1830	A. Houska arrives in Albuquerque. STOP.

COMPLETE ONE SHEET FOR EACH SHIFT

APPENDIX B

FIELD DATA

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-011189 *
DATE SAMPLED	110589
TIME	1030 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-1
WELL/BORING DIAMETER (in)	4, stainless steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4053.42 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.81
Depth to Groundwater (ft)	11.24
CALCULATIONS	
Thickness of Groundwater (ft)	6.57
Well Volume (gallons)	4.27
Purge Volume (gallons) for five casing volumes	21.36
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0 ppm.
  Date 110589; Time 1457
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1030.

(time = 1030)

* Sample GMW-011189 also collected at this monitor well for analysis at Missouri River Div. Lab. Samples were alternated by parameter with MW-01's sample. (1 new bailer was used for each parameter. MW-01's sample was analyzed for four replicates of TOC & TOX. (4 TOX collected))

Well No. MW-1
Date 110289
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.04

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0941	4	19.5	6.68	57,900	Clear
0946	8	19.5	6.68	58,600	TURBID - Bailing at Bottom
0951	12	20.0	6.74	59,100	H2O level drops Turbid
0958	16	19.5	6.73	59,900	Less Turbid
1004	20	20.0	6.72	60,300	Still turbid
1008	22	19.5	6.73	60,700	" "

Reading after sample collection: x 4

1031	20.0	6.76	59,100	some clearing
1035	20.0	6.76	59,600	" "
1039	20.0	6.74	60,100	" "
1043	20.0	6.76	60,100	" " slightly turbid

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	~~MW~~ S-021187 *
DATE SAMPLED	~~*~~ 110787
TIME	1400 ~~1500~~ (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	S-2
WELL/BORING DIAMETER (in)	2, PVC
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	not on well cap FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	20.24
Depth to Groundwater (ft)	9.47
CALCULATIONS	
Thickness of Groundwater (ft)	10.77
Well Volume (gallons)	1.76
Purge Volume (gallons) for five casing volumes	8.8
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0 ppm.
  Date 110589; Time 1527
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = ~~1500~~ 1400.

* Duplicate sample (id no. MW-121189 (includes coliform bact.)) collected at S-2. Parameters were alternated starting with S-2 samples. Time for dup sample = 1500. -- 4 replicate ~~TOC~~ TOX collected on S-2 sample

Well No. S-2
Date 110789
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.09

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1350	2	18.5	~~7.0~~ 7.10	7,700	Clear very little color
1354	4	18.0	7.21	8,100	" " " "
1358	6	18.0	7.25	8,400	" " " "
1401	8	18.0	7.26	8,300	" " " "
1404	9	18.0	7.26	9,000	" " " "

Reading after sample collection: x4

1423	18.0	7.22	8,900
1426	18.0	7.28	8,400
1429	18.0	7.30	8,500
1432	18.0	7.31	8,400

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-021189
DATE SAMPLED	110789
TIME	1000 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-2
WELL/BORING DIAMETER (in)	4, stainless steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4039.78 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.70
Depth to Groundwater (ft)	6.04
CALCULATIONS	
Thickness of Groundwater (ft)	11.66
Well Volume (gallons)	7.58
Purge Volume (gallons) for five casing volumes	37.9
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0 ppm.
  Date 11/05/89; Time 1557
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1030.

One casing volume removed prior to collection of coliform bacteria.

Well No. MW-2
Date 11-9-89
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.06

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0904	5	20.0	7.20	4,200	Clear, very little color
0910	10	20.0	7.22	4,200	" " " "
0916	15	20.0	7.19	4,300	" " " "
0921	20	20.0	7.20	4,300	" " " "
0925	25	20.0	7.20	4,300	" " " "
0929	30	20.0	7.20	4,400	" " " "
0934	35	20.0	7.18	4,400	" " " "
0938	38	20.0	7.20	4,600	" " " "

Reading after sample collection:

0949 20.5 7.17 - 5,200

Additional Comments:

Low conductivity - All wells read on 0-200,000 umhos/cm scale
pH stabilized 3 ~ 4 minutes

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-031189
DATE SAMPLED	11/07/89
TIME	0830 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-3
WELL/BORING DIAMETER (in)	4, stainless steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4037.38 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.71
Depth to Groundwater (ft)	9.21
CALCULATIONS	
Thickness of Groundwater (ft)	8.50
Well Volume (gallons)	5.53
Purge Volume (gallons) for five casing volumes	27.7
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0 ppm.
  Date 11/05/89; Time 1545
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1030.
One casing volume purged prior to sampling for coliform bacteria.

Well No. MW-3
Date 11/07/89
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 1ST well Std. on pH 7.00

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0747	5	19.0	7.00	17,200	Clear but slightly greenish/ye
0754	10	19.0	7.01	16,600	" " " "
0802	15	19.0	7.01	16,100	" " " " "
0809	20	19.0	6.99	16,100	" " " " "
0816	25	19.0	7.01	15,800	" " " " "
0821	28	19.0	7.07	15,600	" " " " "

Reading after sample collection:

0832 19.0 7.06 15,600

Additional Comments:

pH stabilized in three to four minutes

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-041189
DATE SAMPLED	11/06/89
TIME	1245 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-4
WELL/BORING DIAMETER (in)	4, stainless steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4030.30 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.80
Depth to Groundwater (ft)	6.41
CALCULATIONS	
Thickness of Groundwater (ft)	11.39
Well Volume (gallons)	7.41
Purge Volume (gallons) for five casing volumes	37.06
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0 ppm.
  Date 11/05/89; Time 1653
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1245.

Well No. MW-4
Date 11/06/89
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.01

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1145	5	20.0	6.86	12,700	Clear - Slightly Cloudy
1151	10	20.0	6.90	12,600	" " "
1157	15	19.5	6.93	12,900	" " "
1202	20	19.5	6.89	13,200	" " "
1208	25	20.0	6.90	13,000	" " "
1213	30	20.0	6.88	13,100	" " "
1218	35	20.0	6.88	13,200	" " "
1223	38	19.5	6.90	13,100	" " "

Reading after sample collection:

1234 19.5 6.87 13,000

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	110789
DATE SAMPLED	MW-051189
TIME	1215 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-5
WELL/BORING DIAMETER (in)	4, stainless steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.72
Depth to Groundwater (ft)	6.04
CALCULATIONS	
Thickness of Groundwater (ft)	11.68
Well Volume (gallons)	7.60
Purge Volume (gallons) for five casing volumes	38.0
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0 ppm.
  Date 11/05/89; Time 1625
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1215.

Well No. MW-5
Date 110789
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.03

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1126	5	19.5	6.90	12,700	Clear-very little color
1132	10	19.5	6.87	12,600	" " " "
1138	15	20.0	6.85	12,800	" " " "
1142	20	19.5	6.85	12,800	" " " "
1147	25	19.5	6.84	12,700	" " " "
1151	30	20.0	6.85	12,500	" " " "
1155	35	20.0	6.85	12,400	" " " "
1158	38	19.5	6.84	12,500	" " " "

Reading after sample collection:

1209 - 19.5 - 6.82 - 12,300

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-06 (1)
DATE SAMPLED	Nov 6, 1989
TIME	0930 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-6
WELL/BORING DIAMETER (in)	4, stainless steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4036.21 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.78
Depth to Groundwater (ft)	8.13
CALCULATIONS	
Thickness of Groundwater (ft)	9.65
Well Volume (gallons)	~~.84~~ 6.28
Purge Volume (gallons) for five casing volumes	31.40
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.3 ppm; Well borehole= 0. ppm.
  Date 11/05/89; Time 1727
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1045.
One casing volume ~~collected~~ purged prior to collection of coliform bacteria.

Well No. MW-6
Date [illegible]
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.00 - 1ST well of the Day - Standardized

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0839	5	20.0	7.55	91,900	Greenish color but nearly clear
0846	10	19.5	7.22	92,600	" " " " "
0854	15	20.0	7.05	94,200	" " " " "
0900	20	20.0	6.95	94,400	" " " " "
0907	25	20.0	6.88	94,400	" " " " "
0914	30	20.0	6.89	93,500	" " " " "
0919	32	20.0	6.87	94,600	" " " " "

Reading after sample collection:

0931 - 20°C - 6.83 - 96,500 -

Additional Comments:

pH, Sp Cond & Thermometer kept in shade during purging and readings
Readings allowed to stabilize, approximately 3-4 minutes

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-071189
DATE SAMPLED	110789
TIME	1300 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-7
WELL/BORING DIAMETER (in)	4, stainless steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4039.88 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.69
Depth to Groundwater (ft)	6.45
CALCULATIONS	
Thickness of Groundwater (ft)	11.24
Well Volume (gallons)	7.31
Purge Volume (gallons) for five casing volumes	36.5
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0 ppm.
  Date 11/05/89; Time 1618
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1300.

Well No. MW-7
Date 11/07/89
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.03

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1235	5	20.0	6.94	6,300	clear-very little color
1240	10	20.5	6.96	6,200	" " " "
1246	15	20.0	6.97	6,200	" " " "
1251	20	20.0	6.96	6,000	" " " "
1256	25	20.0	6.96	6,000	" " " "
1301	30	20.0	6.98	6,100	" " " "
1306	35	20.5	6.97	6,000	" " " "
1308	37	20.0	6.98	6,200	" " " "

Reading after sample collection:

1318 20.0 6.97 - 6,000

Additional Comments:

Low Conductivity - All wells measured on 0-200,000 umhos/cm scale

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-081189 *
DATE SAMPLED	110889
TIME	0900 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-8
WELL/BORING DIAMETER (in)	4, Stainless Steel
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4040.50 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.76
Depth to Groundwater (ft)	6.95
CALCULATIONS	
Thickness of Groundwater (ft)	10.81
Well Volume (gallons)	7.03
Purge Volume (gallons) for five casing volumes	35.16
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0 ppm.
  Date 1607; Time 11/05/89
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 0900.

* Sample No. QMW-081189 collected (except for Coliform bacteria) + sent to Missouri River Division Lab. Parameters were alternated. New bailers were collected between ~~lab bottles~~ parameters sets.

Well No. MW-8
Date 11/08/89
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.00 Standardized 1ST well

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0757	5	19.0	7.06	8,300	Clear - very light color
0803	10	19.5	6.98	9,600	
0808	15	20.0	6.96	10,800	
0814	20	19.0	6.96	10,500	
0819	25	19.5	6.96	10,600	
0824	30	19.5	6.96	10,800	
0829	35	19.5	6.94	11,500	
0834	36	19.0	6.92	12,200	

Reading after sample collection:

0854 19.0 6.97 10,800

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	S-041189
DATE SAMPLED	110689
TIME	1030 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	S-4
WELL/BORING DIAMETER (in)	2, PVC
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	not listed on well cap FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	14.35
Depth to Groundwater (ft)	9.52
CALCULATIONS	
Thickness of Groundwater (ft)	4.83
Well Volume (gallons)	~~3.14~~ 0.79
Purge Volume (gallons) for five casing volumes	~~15~~ 3.93
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

° HNu PID Background= 0.4 ppm; Well borehole= 0.1 ppm.
Date 11/05/89; Time 1717

° See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.

° See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1030.

Well No. S-4
Date 11/06/89
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.09

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1006	1	20.0	6.8~~5~~7	64,800	Clear - Slightly Green
1011	2	20.0	7.01	64,700	" " "
1017	3	20.0	7.05	64,900	" " "
1023	4	19.5	7.11	65,300	" " "

Reading after sample collection:

1037 20.0 - 7.11 - 65,300

Additional Comments:

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CCE-HAFB
Project No. 3012541
Page 1 of 2

IT CORPORATION

WATER LEVEL INDICATOR CALIBRATION

EQUIPMENT NUMBER SN 66-01535

EQUIPMENT NAME ORS Interface Probe

DATE 11/05/89 DATE LAST CALIBRATED unknown

CALIBRATION PERIOD Calibrated before use

Time = 1445

Calibrated from bottom prongs

Interface Probe MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)
0	NA								
5	5.0	105		205		305		405	
10	10.0	110		210		310		410	
15	15.0	115		215		315		415	
20	20.0	120		220		320		420	
25	25.0	125		225		325		425	
30	30.0	130		230		330		430	
35	35.0	135		235		335		435	
40	40.0	140		240		340		440	
45	—	145		245		345		445	
50	—	150		250		350		450	
55	—	155		255		355		455	
60	—	160		260		360		460	
65	—	165		265		365		465	
70	—	170		270		370		470	
75	—	175		275		375		475	
80	—	180		280		380		480	
85	—	185		285		385		485	
90	—	190		290		390		490	
95	—	195		295		395		495	
100	—	200		300		400		500	

NOTE: ACCEPTANCE IS ± 0.1 FEET

SIGNED [illegible]

CCE-HAFB
Project No. [illegible]
Page 2 of 2

IT CORPORATION

WATER LEVEL INDICATOR CALIBRATION

EQUIPMENT NUMBER SN 06-01535

EQUIPMENT NAME ORS Interface Probe

DATE 11/05/89 DATE LAST CALIBRATED 11/05/89

CALIBRATION PERIOD Calibrated after use

Time = 1730

Calibrated from within [illegible]

Interface Probe MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)
0	NA								
5	5.0	105		205		305		405	
10	10.0	110		210		310		410	
15	15.0	115		215		315		415	
20	20.0	120		220		320		420	
25	25.0	125		225		325		425	
30	30.0	130		230		330		430	
35	35.0	135		235		335		435	
40	40.0	140		240		340		440	
45	—	145		245		345		445	
50	—	150		250		350		450	
55	—	155		255		355		455	
60	—	160		260		360		460	
65	—	165		265		365		465	
70	—	170		270		370		470	
75	—	175		275		375		475	
80	—	180		280		380		480	
85	—	185		285		385		485	
90	—	190		290		390		490	
95	—	195		295		395		495	
100	—	200		300		400		500	

NOTE: ACCEPTANCE IS ± 0.1 FEET

SIGNED Gene M Hawke

APPENDIX C

SAMPLE CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117945

C/C Control No. 105553

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS/Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214416

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-061189	well number MW-6 ; ground water	110689; 0930	Ground Water	Amber Glass	OK, SK, 11-7-89	
				Amber Glass		
				CPE		
				Clear ~~Amber~~ Glass		
				CPE		
				CPE ~~Amber Glass~~		
				CPE		
				amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska; IT Corp; 110689; 1600

   Received By: SK Kennedy, ITAS, 11-7-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00204

ITNA 44534

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117945
C/C Control No. 105553

PROJECT NAME	COE-Holloman AFB	DATE SAMPLES SHIPPED	~~09~~ 11/ 06/89
PROJECT NUMBER	301251.02	LAB DESTINATION	ITAS-Knoxville
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Mary Tyler
BILL TO	International Technology Corp. 5301 Central Ave NE Suite 700 Albuquerque, NM 87108	SEND LAB REPORT TO	International Technology 5301 Central Ave NE Ste 700 Albuquerque, NM 87108
PURCHASE ORDER NO.	90-077	DATE REPORT REQUIRED	120189
		PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-061189	Ground Water	1 x 250 ml	Ice, H_2SO_4	TOC	See attached
↓	↓	1 x 1 l	↓	PEST	Sheets for
		1 x 1 l	; HNO_3	Total Metals	Specific analytical
		1 x 500 ml	; H_2SO_4	Phenolics	requirements
		1 x 1 l		Wet Chem	
		1 x 1 l	; H_2SO_4	NO_2, NO_3	
		2 x 1 l		Rad. Chem	
		1 x 1 l		Herb.	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels [illegible]nces)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 11-7-89 0900 Sal 11-7-89

WHITE - Original, to accompany samples
YELLOW - Field copy

00201

ITNA 44534

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106736

C/C Control No. 105543

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214416

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
3-041189	Well No. 3-4	110689; 1630	Ground Water	Amber Glass	OK, SAK, 11-7-89	
				Amber Glass		
				CPE		
				Clear ~~Amber~~ Glass		
				CPE		
				CPE ~~Amber Glass~~		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 110689; 1403

   Received By: SA Kennedy, ITAS, 11-7-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00205

ITNA 011534

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106736
C/C Control No. 105543

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-077

DATE SAMPLES SHIPPED: 11/06/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 120189
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-041189	Ground Water	250 ml	ice ; H_2SO_4	TOC	See attached sheets
		1 ~~gal~~ l		Pest, ~~Herb~~	for specific analytical
		1 L	; HNO_3	T. Metals	requirements.
		1L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		1 L	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem	
		1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels [illegible] nces)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic [illegible] Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By SA Kennedy Date/Time 11-7-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44534

00202

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106737

C/C Control No. 105544

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214416

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-04|189	Monitor well MW-04	110689; 1245	Ground Water	Amber Glass	OK, SGK, 11-7-89	
				~~Amber Glass~~		
				CPE		
				Clear and ~~Amber~~ Glass		
				CPE		
				CPE and ~~Amber Glass~~		
				CPE		
				Amberglass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp; 110689; 1555

   Received By: SG Kennedy, ITAS, 11-7-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00203

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44534

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106737
C/C Control No. 105544

PROJECT NAME: COE-Holloman AFb
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-077

DATE SAMPLES SHIPPED: 11/06/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 120189
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-040189	Ground Water	250 ml	ice ; H_2SO_4	TOC	See attached sheets
		1 ~~gal~~ l amb		Pest, ~~Herb~~ amb	for specific analytical
		1 L	; HNO_3	T. Metals	requirements
		1 L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		1 L	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem	
		1 l		~~Herb~~	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels [illegible]nces)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By M Kennedy Date/Time 11/7/89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00200

TN 44534

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN OF CUSTODY RECORD

R/A Control No. 118248

C/C Control No. 145307

PROJECT NAME/NUMBER ITNA 4453[illegible]

LAB DESTINATION IT MUL

SAMPLE TEAM MEMBERS

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time	[illegible]	[illegible]	[illegible]	Disposal Record No.
JT8936	MW-04/1189					
JT8937	MW-06/1189					
JT8938	S-09/1189					

Special Instructions: See table 3[illegible]

Possible Sample Hazards:

SIGNATURE(S), Printed, Company, Date and Time:

1. Relin[illegible] Kennedy, IT[illegible]

Rec[illegible]

2. Relin[illegible] By:

Received By:

WHITE - To accompany samples
YELLOW - Field copy

00207

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118248
C/C Control No. 145307

PROJECT NAME: ITNA 44534 [redacted]
PROJECT NUMBER: [redacted]
PROJECT MANAGER: [redacted]
BILL TO: ITAS ([redacted]

DATE SAMPLES SHIPPED: 11-7-89
LAB DESTINATION: IT Mwl
LABORATORY CONTACT: [redacted]
SEND LAB REPORT TO: IT Corp Middlebrook Pk

PURCHASE ORDER NO. 486000.04

DATE REPORT REQUIRED: 11/29/89
PROJECT CONTACT: Mary Tyler
PROJECT CONTACT PHONE NO. [illegible]

Sample No.	Sample Type	Sample Volume	Preservative	Requested Analysis	Special Instructions
JJ8936	Water	2 L		Pb, Cd, Cu, Zn, Cr	See table 3+4 for methods + det. limits.
JJ8937	"	"			
JJ8938	"	"			

COPY

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain [illegible] toxics)

Nonhazardous ____ Flammable ____ Skin Irritant ____ Highly Toxic [redacted] Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

00206

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. B 91770

C/C Control No. 58755

PROJECT NAME/NUMBER COE- Holloman AFB/ 301251.02

LAB DESTINATION ITAS-Austin

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330213694

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-111189	Monitor Well No. MW-11	110589; 0930	Ground water	Amber Glass; Septa cap	GOOD	
MW-061189	Monitor Well No. MW-06	110689; 0930	↓	Amber Glass; Septa cap	COND.	
MW-041189	Monitor Well No. MW-04	110689; 1245	↓	Amber Glass; Septa cap	W/ ICE	
S-041189	Monitor Well No. S-4	110689; 1030	↓	Amber Glass; Septa cap		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, ITCorp, 110689; 1401

   Received By: Chris Dolinoff 11/7/89 0915

2. Relinquished By: Chris Dolinoff 11/16/89 1045

   Received By: [illegible] 11-16-89 1045

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. B 91770
C/C Control No. 58755

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-078
* Bid No. AJS89137

DATE SAMPLES SHIPPED: 11/06/89
LAB DESTINATION: ITAS-Austin
LABORATORY CONTACT: Tony Spinelli
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 12/01/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-111189	Ground water	250 ml	iced; H_2SO_4	POX	See attached sheets
MW-061189	↓	↓	↓ ↓	↓	for specific
MW-041189					analytical requirements.
S-041189					

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Ann Schmerott Date/Time 11/7/89 0915

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 6[illegible]

C/C Control No. A 35203

PROJECT NAME/NUMBER [illegible] Chem [illegible]/301151.02

LAB DESTINATION [illegible] State University-Lab [illegible]

SAMPLE TEAM MEMBERS A. [illegible], J. Lyon

CARRIER/WAYBILL NO. Hand Delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-061189	Monitor Well No. MW-6	110689; 1045	Groundwater	CPE; Sterile		
MW-041189	↓ ↓ MW-4	↓ ; 1245	↓	↓ ↓		
~~MW-~~ S-041189 omit	↓ ↓ S-4	↓ ; 1030	↓	↓ ↓		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Mark Lyon, IT Corp., 11-06-89, 1410
   Received By: [illegible] Tallahassee, Florida [illegible]

2. Relinquished By: _____
   Received By: _____

3. Relinquished By: _____
   Received by: _____

4. Relinquished By: _____
   Received By: _____

WHITE - To accompany samples
YELLOW - Field copy

TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. [illegible]
C/C Control No. A [illegible]

PROJECT NAME [illegible]
PROJECT NUMBER [illegible]
PROJECT MANAGER [illegible]
BILL TO International Technology Corp.
[illegible] Central Ave NE, Suite 8[illegible]
Albuquerque, NM 87108

PURCHASE ORDER NO. N/A

DATE SAMPLES SHIPPED [illegible]06 [illegible]
LAB DESTINATION [illegible]
LABORATORY CONTACT [illegible]
SEND LAB REPORT TO International Technology Corp.
5301 Central Ave, N.E., Suite [illegible]
Albuquerque, NM 87108

DATE REPORT REQUIRED 12-11/01/89
PROJECT CONTACT Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-3800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-061189	[illegible] water	120 ml	iced	Coliform Bacteria	See attached sheets
MW-041189	↓	↓	↓	↓	for specific
S-041189					analytical requirements

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of h[illegible]ances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological
(Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By [illegible] **Date/Time** [illegible]

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106738

C/C Control No. 105545

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214486

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-031189	Monitor Well MW-03	110789; 0830	Ground Water	Amber Glass	Cold & intact, sak, 11-8-89	
				Amber Glass		
				CPE		
				Clear ~~Amber~~ Glass		
				CPE		
				CPE ~~Amber Glass~~		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska; ITCorp; 110789; 1550

   Received By: Sa Kennedy, ITAS, 11-8-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00235

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44544

Ust. Seal broke

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106738
C/C Control No. 105545

PROJECT NAME	COE-Holloman AFb	DATE SAMPLES SHIPPED	11/07/89
PROJECT NUMBER	301251.02	LAB DESTINATION	ITAS-Knoxville
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Mary Tyler
BILL TO	International TEchnology 5301 Central Ave NE Suite 700 Albuquerque, NM 87108	SEND LAB REPORT TO	International Technolgy 5301 Central Ave NE Ste 700 Albuquerque, NM 87108
PURCHASE ORDER NO.	90-077	DATE REPORT REQUIRED	12/01/89
		PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-031189	Ground Water	250 ml	ice; H_2SO_4	TOC	See attached sheets
		1 ~~gal~~ l		Pest, ~~Herb~~	for specific analytical
		1 L	; HNO_3	T. Metals	requirements.
		1 L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		1 L	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem	
		1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of [illegible]ances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 11-8-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00241

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106730

C/C Control No. 105546

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214486

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-021189	Monitor Well No. MW-2	110789; 1000	Ground Water	Amber Glass	Cold & intact, sd, 11-8-89	
				Amber Glass		
				CPE		
				Clear ~~Amber~~ Glass		
				CPE		
				CPE ~~Amber~~ Glass		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann Mitowska; ITCorp; 110789; 1602

   Received By: Sd Kennedy, ITAS, 11-8-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00234

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106730
C/C Control No. 105546

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-077

DATE SAMPLES SHIPPED: 11/07/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 12/01/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-021189	Ground Water	250 ml	ice; H_2SO_4	TOC	See attached sheets
		1 ~~gal~~ 1 qart		Pest, ~~Herb~~ qart	for specific analytical
		1 L	; HNO_3	T. Metals	requirements.
		1 L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		1 L	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem	
		1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of h[illegible]nces)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 11-8-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00240

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106743

C/C Control No. 105547

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214486

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-051189	Monitor Well No. MW-5	110789; 1215	Ground Water	Amber Glass	Cold & intact, sak, 11-8-89	
				Amber Glass		
				CPE		
				~~Amber~~ Clear Glass		
				CPE		
				~~Amber Glass~~ CPE		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, ITCorp, 110789; 1600

   Received By: SA Kennedy, ITAS, 11-8-89, 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00236

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106743
C/C Control No. 105547

PROJECT NAME: COE-Holloman AFb
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave, NE. Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-077

DATE SAMPLES SHIPPED: 11/2/07/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave, NE, Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 12/01/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-051189	Ground Water	250 ml	ice ; H_2SO_4	TOC	See attached sheets
		1 ~~gal~~ l		Pest, ~~Herb~~ amt	for specific analytical
		1 L	; HNO_3	T. Metals	requirements.
		1 L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		1 L	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem	
		1 l		Herb amt	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of [redacted]nces)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 11-8-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00242

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. ~~#9~~ 117944

C/C Control No. 105548

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214486

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-071189	Monitor Well No. MW-7	110789; 1300	Ground Water	Amber Glass	Cold & intact, Sak, 11-8-89	
				Amber Glass		
				CPE		
				~~Amber~~ Clear Glass		
				CPE		
				~~Amber Glass~~ CPE		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska; ITCorp; 110789; 1610

   Received By: SA Kennedy, ITAS, 11-8-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00237

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117944
C/C Control No. 105548

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-077

DATE SAMPLES SHIPPED: 11 ~~09~~/07/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 12/01/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-071189	Ground Water	250 ml	Ice; H_2SO_4	TOC	See Attached Sheets
↓	↓	1 l	↓	Pest	for specific
		1 l	; HNO_3	T. Metals	analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem.	
		1 l	; H_2SO_4	NO_2, NO_3	
		2x 1 l		Rad Chem	
↓	↓	1 l	↓	Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of [illegible]nces)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By SA Kennedy Date/Time 11-8-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00243

ITAS 445416

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117937

C/C Control No. 105550

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214486

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S-021189	Monitor Well S-2	110789; 1400	Ground Water	Amber Glass	Cold & intact, sak, 11-8-89	
				Amber Glass		
				CPE		
				Clear ~~Amber~~ Glass		
				CPE		
				CPE ~~Amber Glass~~		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp, 110789; 1558

   Received By: SA Kennedy, ITAS, 11-8-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00239

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117937
C/C Control No. 105550

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-077

DATE SAMPLES SHIPPED: 110789
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave, NE, Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 120189
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-021189	Ground Water	250 ml ~~x 4~~ amb	ice ; H_2SO_4	TOC X 4	See attached sheets
		1 ~~gal~~ l		Pest, ~~Herb~~	for specific analytical
		1 L	; HNO_3	T. Metals	requirements.
		1 L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		1 L	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem	
		1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of [illegible]ances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 11-8-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00245

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117947

C/C Control No. 105549

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214486

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-12/189	Monitor Well No MW-12	110789; 1500	Ground Water	Amber Glass	Cold & intact, sak, 11-8-89	
				Amber Glass		
				CPE		
				Clear ~~Amber~~ Glass		
				CPE		
				~~Amber Glass~~ CPE		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 110789; 1549

   Received By: Sa Kennedy, ITAS, 11-8-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00238

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44544

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117947
C/C Control No. 105549

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-077

DATE SAMPLES SHIPPED: 11 ~~09~~/07/89
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International TEchnology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 120189
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-121189	Ground Water	250 ml	ice ; H_2SO_4	TOC	See attached sheets for specific analytical requirements.
		1 l		Pest	
		1 l	; HNO_3	T. Metals	
		1 l	; H_2SO_4	Phenolics	
		1 l		Wet Chem	
		1 l	; H_2SO_4	NO_2, NO_3	
		2x 1 l		Rad Chem	
		1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of [redacted]nces)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 11-8-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00244

ITNA 44514

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118236

C/C Control No. 145325

PROJECT NAME/NUMBER IINA 44544

LAB DESTINATION IT RSL

SAMPLE TEAM MEMBERS

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Initial and Date)	Disposal Record No.
JJ9012	MW-021189	11-7-89	Water	Aqueous		
JJ9013	MW-031189					
JJ9014	MW-051189					
JJ9015	MW-071189					
JJ9016	MW-121189					
JJ9017	S-021189					

COPY

Special Instructions: See tables 3+4 for methods + det limits

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: SA Kennedy, ITMS, 11-8-89 1300

Received By:

2. Relinquished By:

Received By:

3. Relinquished By:

Received By:

4. Relinquished By:

Received By:

WHITE - To accompany samples
YELLOW - Field copy

00246

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118736
C/C Control No. 145325

PROJECT NAME: ITNA 44544
PROJECT NUMBER: COE - Hellanen AFB [redacted]
PROJECT MANAGER:
BILL TO: ITAS (PC [redacted])

DATE SAMPLES SHIPPED: 11-8-89
LAB DESTINATION: IT RSL
LABORATORY CONTACT:
SEND LAB REPORT TO: IT Corp. Middlebrook Pk

PURCHASE ORDER NO. 486000.

DATE REPORT REQUIRED: 11-29-89
PROJECT CONTACT: Mary Tyler
PROJECT CONTACT PHONE NO. 588-6401

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
JJ9012	Water	2 l	ice	Radium, Gross Alpha, Gross Beta	See tables 3+4 for methods + det. limits
JJ9013	↓	↓	↓	↓	
JJ9014					
JJ9015					
JJ9016					
JJ9017					

COPY

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high level [redacted] ices)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic [redacted] Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

00217

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. B 91771

C/C Control No. A 95207

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Austin

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330213683

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-031189	Monitor Well No. ~~MW~~-MW-3	110789; 0830	Ground water	Amber Glass;	Septa cap Good	
MW-021189	Monitor Well No. MW-2	110789; 1000	↓	Amber Glass;	Septa cap Cond.	
MW-051189	↓ ↓ ↓ MW-5	110789; 1215	↓	Amber Glass;	Septa cap w/ice	
MW-071189	↓ ↓ ↓ MW-7	110789; 1300	↓	Amber Glass;	Septa cap	
S-021189	S-2	110789; 1400		↓	↓	
MW-121189	↓ ↓ ↓ MW-12	110789; 1500	↓	↓	↓	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 110789; 1601

   Received By: Chris Schnecoff 11/8/89 0930

2. Relinquished By: Chris Schnecoff 11/16/89 1045

   Received By: Jane Middy 11-16-89 1045

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. B 91771
C/C Control No. A 95207

PROJECT NAME	COE-Holloman AFB	DATE SAMPLES SHIPPED	11/07/89
PROJECT NUMBER	301251.02	LAB DESTINATION	ITAS-Austin
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Tony Spinelli
BILL TO	International Technology Corp. 5301 Central Ave NE, Suite 700 Albuquerque, NM 87108	SEND LAB REPORT TO	International Technology Corp. 5301 Central Ave NE, Suite 700 Albuquerque, NM 87108
PURCHASE ORDER NO.	90-078	DATE REPORT REQUIRED	12-~~11~~/01/89
	* Bid No. AJS 89131	PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-031189	Ground water	250 ml	iced; H_2SO_4	POX	See attached sheets
MW-021189	↓	↓	↓	↓	for specific
MW-051189					analytical requirements.
MW-071189	↓	↓	↓	↓	
S-021189		x 4		x 4*	
MW-121189	↓	↓	↓	↓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By Chris Schmeff **Date/Time** 11/8/89 0930

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106727

C/C Control No. 105500

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION NM State University-Las Cruces

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Hand Delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-031189	Monitor Well No. MW-03	110789; 1030	Groundwater	CPE; Sterile		
MW-021189	MW-02	110789, 1030	↓	↓		
MW-051189	MW-05	110789; 1215	↓	↓		
MW-071189	MW-07	110789; 1300	↓	↓		
MW-121189	MW-12	110789; 1500	↓	↓		
S-021189	S-2	110789; 1400	↓	↓		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Mark Lyon, IT Corp., 11-07-89, 1555

Received By: [illegible]

MLL 11-07-89

2. ~~Relinquished By~~: [illegible]

(1) Received By: [illegible] 11-7-89, 355

3. Relinquished By: [illegible]

Received by: [illegible]

4. Relinquished By: [illegible]

Received By: [illegible]

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106727
C/C Control No. 105500

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: N/A

DATE SAMPLES SHIPPED: 11/07/89
LAB DESTINATION: NM State University-Las Cruces
LABORATORY CONTACT: Andy Bristol
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 12~~11~~/01/89
PROJECT CONTACT: Dann Mey[redacted]
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-031189	Ground water	120 ml	iced	Coliform Bacteria	See attached sheets
MW-021189	↓	↓	↓	↓	for specific
MW-051189					analytical requirements.
MW-071189	↓	↓	↓	↓	
MW-121189					
~~S~~-021189	↓	↓	↓	↓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of haz[redacted]stances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By Noah Hagstrom Sr. Plant Tech. Date/Time 11-7-89, 3:55

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 117946

C/C Control No. 105551

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214490

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-081189	Monitor Well No. MW-08	110889; 0900	Ground Water	Amber Glass	Cold intact BM 11-9-89	
				Amber Glass		
				CPE		
				~~Amber Glass~~ Clear Glass amH		
				CPE		
				~~Amber Glass~~ CPE amH		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 110889; 1128

   Received By: Beth Monroe, ITAS 11-9-89, 0800

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00194

WHITE - To accompany samples
YELLOW - Field copy

ITIN 40561

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 117946

C/C Control No. 105551

PROJECT NAME	COE-Holloman AFB	DATE SAMPLES SHIPPED	~~09~~ 08/89
PROJECT NUMBER	301251.02	LAB DESTINATION	ITAS-Knoxville
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Mary Tyler
BILL TO	International Technology Corp. 5301 Central Ave NE Suite 700 Albuquerque, NM 87108	SEND LAB REPORT TO	International Technology 5301 Central Ave NE Ste 700 Albuquerque, NM 87108
PURCHASE ORDER NO.	90-077	DATE REPORT REQUIRED	12-01-89
		PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-08189	Ground Water	250 ml	ice ; H_2SO_4	TOC	See attached
MW-081189		1 l		Pest	sheets for
		1 l	; HNO_3	T. Metals	specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem	
		1 l	; H_2SO_4	NO_2, NO_3	
		2x1 l		Rad Chem	
		2 1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Beth Monroe Date/Time 11-9-89, 0800

WHITE - Original, to accompany samples
YELLOW - Field copy

00193

ITNA 44561

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106731

C/C Control No. 105552

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214490

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-011189	Monitor Well No. MW-01	110889; 1030	Ground Water	Amber Glass	Cold + intact BMM 11-9-89	
				Amber Glass		
				CPE		
				~~Amber~~ Clear Glass amt		
				CPE		
				~~Amber Glass~~ CPE amt		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Jan M. Houska; ITCorp; 110889; 1125
   Received By: Beth Monroe, ITAS, 11-9-89, 0800
2. Relinquished By:
   Received By:
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00192

ITNA 49561

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106731
C/C Control No. 105552

PROJECT NAME	COE-Holloman AFb	DATE SAMPLES SHIPPED	110889
PROJECT NUMBER	301251.02	LAB DESTINATION	ITAS-Knoxville
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Mary Tyler
BILL TO	International Technology	SEND LAB REPORT TO	International Technology
	5301 Central Ave NE Suite 700		5301 Central Ave NE Ste 700
	Albuquerque, NM 87108		Albuquerque, NM 87108
PURCHASE ORDER NO.	90-077	DATE REPORT REQUIRED	120189
		PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-011189	Ground Water	250 ml	Ice ; H_2SO_4	TOC x 4 *	See attached sheets
		1 ~~gal~~ l		PEst, ~~Herb~~ amH	for specific analytical
		1 L	; HNO_3	T. Metals	requirements.
		1 L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		1 L	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem	
		1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Beth Monroe Date/Time 11-9-89, 0800

WHITE - Original, to accompany samples
YELLOW - Field copy

00191

ITNA 9951.1

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 116141

C/C Control No. 145318

PROJECT NAME/NUMBER ITNA 14561 [redacted]

LAB DESTINATION RIL

SAMPLE TEAM MEMBERS

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
79126	MW-011189	11-8-89	water	1L Nalgene		
79127	MW-081189	↓	↓	↓		

COPY

Special Instructions: see Table 4-2 for Methods & Detection Limits, please report both JT #s & MW #s with results.

Possible Hazards:

1. (Name, Company, Date and Time) Beth Monroe, ITAS, 11-8-89, 1900

2. Relinquished By:

Received By:

3. Relinquished By:

Received by:

4. Relinquished By:

Received By:

WHITE - To accompany samples
YELLOW - Field copy

00195

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118747
C/C Control No. 14-5318

PROJECT NAME: ITNA 44561
PROJECT NUMBER:
PROJECT MANAGER:
TO: ITAS PO# 2420
5815 Middlebrook Pk.
Knoxville, TN 37921
PURCHASE ORDER NO.: Job# 486000.04

DATE SAMPLES SHIPPED: 11-9-89
LAB DESTINATION: IT-RSL
LABORATORY CONTACT: Frank Delgado
SEND LAB REPORT TO: ITAS Middlebrook
DATE REPORT REQUIRED: 11-27-89
PROJECT CONTACT: Mary Tyler
PROJECT CONTACT PHONE NO.: 588-6401

Lab No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
79126	water	1 l	—	Radium - 226 + - 228,	See Chain of
79127	↓	↓	—	Gross Alpha + Gross	Custody
				Beta on both samples	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Non-hazardous _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy

00196

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106740

C/C Control No. A 95202

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02

LAB DESTINATION ITAS-Austin

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330213672

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-081189	Monitor Well No. MW-8	110889; 1030	Ground water	Amber Glass;	Septa Cap Good Cond.	
MW-011189	Monitor Well No. MW-1	↓ ; ~~1~~ 0900	↓	Amber Glass;	Septa cap w/ICE	
				~~Amber Glass;~~	~~Septa cap~~ am H	
				~~Amber Glass;~~	~~Septa cap~~ am H	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska; IT Corp; 110889; 1130

   Received By: Ann Johnsoff 11/9/89 1035

2. Relinquished By: Ann Johnsoff 11/16/89 1045

   Received By: Jane Lundsley 11-16 89 1045

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

X

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106740
C/C Control No. A 95202

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-078
*Bid No. AJS89137

DATE SAMPLES SHIPPED: 11/08/89
LAB DESTINATION: ITAS-Austin
LABORATORY CONTACT: Tony Spinelli
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 12 ~~11~~ amy/01/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-081189	Ground water	250 ml	iced; H_2SO_4	POX	See attached sheets
MW-011189	↓	250 ml x 4	↓ ↓	POX x 4 (*)	for specific
					analytical requirements.

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By [signature] Date/Time 11/9/89 1035

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. [illegible]

C/C Control No. 105496

PROJECT NAME/NUMBER [illegible]/[illegible]

LAB DESTINATION State University [illegible]

SAMPLE TEAM MEMBERS [illegible], [illegible]

CARRIER/WAYBILL NO. Hand Delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-011187	Monitor Well MW-1	110889, 1030	Groundwater	HDPE; Sterile		
MW-08187	Monitor Well MW-8	↓ 0900	↓	↓		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [illegible] IT Corp, 110889, 1343

   Received By:

2. Relinquished By:

   Received By: [illegible] 1145

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106728
C/C Control No. 105496

PROJECT NAME: Coal-Gallup AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: N/A

DATE SAMPLES SHIPPED: 11/08/89
LAB DESTINATION: NM State University-Las Cruces
LABORATORY CONTACT: Andy Bristol
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 12-~~11~~/01/89 (omy)
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-011189	Ground water	120 ml	iced	Coliform Bacteria	See attached sheets
MW-081189	↓	↓	↓	↓	for specific
					analytical requirements.

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By: [illegible] Date/Time: 11/8/89 [illegible]

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. [illegible]

C/C Control No. 105491

PROJECT NAME/NUMBER [illegible]

LAB DESTINATION [illegible]

SAMPLE TEAM MEMBERS [illegible]

CARRIER/WAYBILL NO. Federal Express 4330214534

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-081889	Monitor Well No MW-8	110889; 0900	Ground Water	Amber Glass		
				Amber Glass		
				Amber Glass		
				CPE		
				Clear ~~Amber~~ Glass amt		
				CPE		
				CPE amt ~~Amber Glass~~		
				CPE		
				Amber Glass Septa Cap		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [illegible] IT Corp, 110889, 1133

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111991
C/C Control No. 105491

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave., NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: NA

DATE SAMPLES SHIPPED: 11/08/89
LAB DESTINATION: USACE-Missouri River Div LAB
LABORATORY CONTACT: Dr. Joe Slosky
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: ~~11~~ 12/01/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-081189	Ground water	250 ml	iced; H_2SO_4	TOC	See attached sheets
QMW-081189		1 l	iced; none	Pest	for specific
		1 l	iced; none	Herb	analytical requirements
		1 l	iced; HNO_3	T. Metals	
		1 l	iced; H_2SO_4	Phenolics	
		1 l	iced; none	Wet Chem	
		1 l	iced; H_2SO_4	NO_2, NO_3	
		2 x 1 l	iced; none	Rad Chem	
		250 ml	iced; H_2SO_4	POX	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106734

C/C Control No. A 95201

PROJECT NAME/NUMBER Gas-Slot Leak; AFB/301251.02

LAB DESTINATION USACE-Missouri River Division

SAMPLE TEAM MEMBERS A. Houska, H. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214534

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-011189	Monitor Well No. MW-1	110889; 1030	Ground water	Amber Glass		
				Amber Glass		
				Amber Glass		
				CPE		
				Clear ~~Amber~~ Glass amH		
				CPE		
				CPE amH ~~Amber Glass~~		
				CPE		
				Amber Glass; Septa Cap		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, ITCorp; 110889; 1130

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106734
C/C Control No. A 95201

PROJECT NAME: C-Hollomon AFB
PROJECT NUMBER: 201251.02
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave., NE, Suite 700
Albuquerque, NM 87108

PURCHASE ORDER NO. NA

DATE SAMPLES SHIPPED: 12 11/08/89
LAB DESTINATION: USACE-Missouri River Div Lab
LABORATORY CONTACT: Dr. Joe Slosky
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108

DATE REPORT REQUIRED: 12 11/01/89
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-011187	Groundwater	250 ml	iced; H_2SO_4	TOC	See attached sheets
QMW-011187		1 l	iced; none	Pest.	for specific
		1 l	iced; none	Herb	analytical requirements
		1 l	iced; HNO_3	T. Metals	
		1 l	iced; H_2SO_4	Phenolics	
		1 l	iced; none	Wet Chem	
		1 l	iced; H_2SO_4	NO_2, NO_3	
		2 x 1 l	iced; none	Rad Chem	
		250 ml	iced; H_2SO_4	POX	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy

APPENDIX D

CERTIFICATES OF ANALYSES

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

November 30, 1989

Job Number: ITNA 44534

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	11/07/89
Number of Samples:	Three (3)
Sample Type:	Water

I. Introduction

On 11/07/89, three (3) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report is included.

The samples were analyzed for total organic carbon (TOC) at the IT-Mixed Waste Laboratory (IT-MWL) in Oak Ridge, Tennessee. A separate laboratory report is included.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

RECEIVED
DEC 11 1989
IT CORP.-ALBUQUERQUE

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

II. Analytical Results/Methodology (continued)

Th samples were analyzed for phenols by colorimetric determination using EPA SW-846 method 9065.

The samples were analyzed for nitrate and nitrite by colorimetric determination using EPA method 353.3.

The samples were analyzed for requested anions by ion chromatography using EPA method 300.0.

The samples were analyzed for fluoride by potentiometric determination using EPA method 340.2.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were extracted for pesticides and herbicides on 11/08/89 and 11/09/89. The samples were analyzed on 11/10/89 and 11/11/89. No problems were encountered.

The phenol analyses were performed on 11/15/89. No problems were encountered.

The nitrate and nitrite analyses were performed on 11/08/89. No problems were encountered.

The anion analyses were performed on 11/28/89. No problems were encountered.

The fluoride determination was performed on 11/10/89. No problems were encountered.

International Technology
November 30, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44534

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	Method Blank	MW-041189	MW-061189	S-041189
Lab Sample ID:	BLA0058/A0070	JJ8930/JJ8933	JJ8931/JJ8934	JJ8932/JJ8935
Lindane	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U	0.1 U
Toxaphene	0.4 U	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/08/89 and 11/09/89
Date Analyzed: 11/10/89 and 11/11/89

International Technology
November 30, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44534

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	Method Blank P0623/P0602/P0605 P0612/P0649	MW-041189 JJ8918/JJ8921/ JJ8924	Analysis Date
Phenols	0.01 U	0.01 U	11/15/89
Nitrate, as N	0.05 U	0.08	11/08/89
Nitrite, as N	0.01 U	0.01 U	11/08/89
Fluoride	0.1 U	0.7	11/10/89
Chloride	0.5 U	2,900	11/28/89
Sulfate	1.5 U	3,200	11/28/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
November 30, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44534

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	MW-061189 JJ8919/JJ8922/JJ8925	S-041189 JJ8920/JJ8923/JJ8926	Analysis Date
Phenols	0.03	0.01 U	11/15/89
Nitrate, as N	2.7	33	11/08/89
Nitrite, as N	0.15	0.01 U	11/08/89
Fluoride	0.9	0.9	11/10/89
Chloride	48,000	31,000	11/28/89
Sulfate	5,100	5,400	11/28/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology Corp.
ITAS-Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Attn: Mary Tyler

Date: November 30, 1989

ITMWL Job Number: ITAB 35724
ITSTU Job Number: ITNA 44534

This is the Certificate of Analysis for the following samples:

Client Project ID:	ITNA 44534
Date Received by Lab:	11/29/89
Number of Samples:	Three (3)
Sample Type:	Water

I. Introduction

On November 29, 1989, three (3) water samples arrived at the ITAS Oak Ridge, Tennessee laboratory from ITAS-Knoxville, Knoxville, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. Analytical Results/Methodology

The samples were analyzed for Total Organic Carbon. Results are presented in the following report and were determined using Method 9060, Test Methods for Evaluating Solid Waste, USEPA SW-846, 3rd edition, 1986.

Reviewed and Approved

Snell A. Mills III
Laboratory Manager

SAM/rdj

ITAS-Knoxville
ATTN: Mary Tyler
Date: November 30, 1989

Job Number: ITAB 35724

Date Received: 11/29/89

Sample Description: Water Concentration Units: mg/L

Client ID: MW-041189, MW-061189, S-041189
IT-MWL ID: MM1670, MM1671, MM1672, BLANK
IT-STU ID: JJ8915, JJ8916, JJ8917

Prep and Anal Date: 11/29/89

T O C

Client ID:	MW-041189	MW-061189	S-041189	BLANK
Average Result:	6.08	10.0	<1.00	<1.00
Sample Range:	5.78-6.45	8.44-12.1	<1.00-<1.00	<1.00-<1.00

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DEC 5

Received: 11/07/89

ITRSL Oak Ridge REPORT
12/05/89 10:12:01

Work Order # R9-11-045

REPORT TO: IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN: JANICE STERRETT

CLIENT: ITAS SAMPLES: 3
COMPANY: IT CORPORATION/MIDDLEBROOK
FACILITY: MIDDLEBROOK PIKE

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

ATTEN: ERS
PHONE: 615-482-9707

CERTIFIED BY

CONTACT: JIM DILLARD

WORK ID: WATER SAMPLES / ITNA 44534
TAKEN:
TRANS:
TYPE:
P.O. #: 486000.04
INVOICE: under separate cover

	SAMPLE IDENTIFICATION
01	JJ8936
02	JJ8937
03	JJ8938

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETA	GROSS BETA
RA226	RA-226
RA228	RA-228
SPEC	SPECIAL FORM FOR REPORTING

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED
DEC 11 1989
IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer DM 12/13/89

November 30, 1989

Job Number: ITNA 44534

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	11/07/89
Number of Samples:	Three (3)
Sample Type:	Water

I. Introduction

On 11/07/89, three (3) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that CLP data are not blank corrected.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

III. Quality Control

The samples were digested on 11/15/89 for ICP and GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 11/15/89; the GFAA analyses for arsenic, lead and selenium were performed on 11/17-25/89; the remaining metals were analyzed by ICP on 11/21/89. All run QC was acceptable. Associated QC samples were analyzed with ITAS project ITNA 44544, sample MW-121189. Due to matrix interferences in these samples, detection limits for the GFAA analyses are higher than normal. The lead and selenium values for sample MW-061189 are reported by ICP and the selenium values for S-041189 are also reported from the ICP.

U.S. EPA - CLP

~~00197~~

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

00001

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

SOW No.: 7/87

EPA Sample No.	Lab Sample ID.
MW-041189	JJ8927
MW-061189	JJ8928
S-041189	JJ8929

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

METALS Lab Manager: _____

Date: _____

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-041189

Lab Name: ITAS-KNOXVILLE Contract: COS HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Matrix (soil/water): WATER Lab Sample ID: JJ8927

Level (low/med): _____ Date Received: 11/07/89

% Solids: 0

00002

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic	9	U	W	F
7440-39-3	Barium	17	B		P
7440-41-7	Beryllium				P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium				P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	332			P
7439-92-1	Lead	11		W	F
7439-95-4	Magnesium				P
7439-96-5	Manganese	440			P
7439-97-6	Mercury	0.2	U		V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium	20	U	W	F
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	1640000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-061189

Lab Name: TMAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: TMS-TU Case No.: MWA 44534 SAS No.: _____ SDG No.: MW-061189

Matrix (soil/water): WATER Lab Sample ID: JJ8928

Level (low/med): _____ Date Received: 11/07/89

% Solids: 0

00003

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		-
7440-36-0	Antimony		-		P
7440-38-2	Arsenic	12	U	W	P
7440-39-3	Barium	33	B		P
7440-41-7	Beryllium		-		P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium		-		P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt		-		P
7440-50-8	Copper		-		P
7439-89-6	Iron	119	-		P
7439-92-1	Lead	30	U		P
7439-95-4	Magnesium		-		P
7439-96-5	Manganese	288	-		P
7439-97-6	Mercury	0.2	U		V
7440-02-0	Nickel		-		P
7440-09-7	Potassium		-		P
7782-49-2	Selenium	60	U		P
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	15900000	-		P
7440-28-0	Thallium		-		F
7440-62-2	Vanadium		-		P
7440-66-6	Zinc		-		P
	Cyanide		-		
			-		

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

S-041189

Lab Name: IT-AS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Matrix (soil/water): WATER Lab Sample ID: JJ8929

Level (low/med): _____ Date Received: 11/02/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

00004

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum		-		
7440-36-0	Antimony		-		P
7440-38-2	Arsenic	3	U	W	F
7440-39-3	Barium	22	B		P
7440-41-7	Beryllium		-		P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium		-		P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt		-		P
7440-50-8	Copper		-		P
7439-89-6	Iron	273	-		P
7439-92-1	Lead	15	U	W	F
7439-95-4	Magnesium		-		P
7439-96-5	Manganese	7	B		P
7439-97-6	Mercury	0.2	U		V
7440-02-0	Nickel		-		P
7440-09-7	Potassium		-		P
7782-49-2	Selenium	60	U		P
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	7920000	-		P
7440-28-0	Thallium		-		F
7440-62-2	Vanadium		-		P
7440-66-6	Zinc		-		P
	Cyanide		-		
			-		

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

00005

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ICP ONLY

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Initial Calibration Source: NBS

Continuing Calibration Source: NBS

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40,000	40600	101.5	40,000	40400	101.0	40500	101.2	P
Antimony	4,000	4190	104.8	4,000	4130	103.2	4120	103.0	P
Arsenic	4,000	3860	96.5	4,000	3810	95.2	3790	94.8	P
Barium	4,000	3760	94.0	4,000	3780	94.5	3700	92.5	P
Beryllium	4,000	4300	107.5	4,000	4260	106.5	4150	103.8	P
Cadmium	4,000	3750	93.8	4,000	3780	94.5	3720	93.0	P
Calcium	40,000	42200	105.5	40,000	41500	103.8	4190	104.8	P
Chromium	4,000	3850	96.2	4,000	3840	96.0	3850	96.2	P
Cobalt	4,000	3920	98.0	4,000	3920	98.0	3880	97.0	P
Copper	4,000	3830	95.8	4,000	3830	95.8	3840	96.0	P
Iron	40,000	43400	108.5	40,000	42900	107.2	42600	106.5	P
Lead	4,000	3860	96.5	4,000	3880	97.0	3840	96.0	P
Magnesium	40,000	40900	102.2	40,000	40200	100.5	39800	99.5	P
Manganese	4,000	3670	91.8	4,000	3680	92.0	3680	91.2	P
Mercury	N/A			N/A					
Nickel	4,000	3870	96.8	4,000	3890	97.2	3680	92.0	P
Potassium	40,000	41200	103.0	40,000	40200	100.5	41600	104.0	P
Selenium	4,000	3810	95.2	4,000	3860	96.5	3620	90.5	P
Silver	4,000	4310	107.8	4,000	4350	108.8	4320	108.0	P
Sodium	40,000	41400	103.5	40,000	42500	106.2	41700	104.2	P
Thallium	4,000	3780	94.5	4,000	3770	94.2	3810	95.2	P
Vanadium	4,000	3720	93.0	4,000	3720	93.0	3690	92.2	P
Zinc	4,000	3730	93.2	4,000	3740	93.5	3780	94.5	P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00006

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ICP ONLY

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Initial Calibration Source: NBS

Continuing Calibration Source: NBS

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40,000			40,000	41100	102.8			P
Antimony	4,000			4,000	4180	104.5			P
Arsenic	4,000			4,000	3860	96.5			P
Barium	4,000			4,000	3720	93.0			P
Beryllium	4,000			4,000	4150	103.8			P
Cadmium	4,000			4,000	3770	94.2			P
Calcium	40,000			40,000	42600	106.5			P
Chromium	4,000			4,000	3880	97.0			P
Cobalt	4,000			4,000	3910	97.8			P
Copper	4,000			4,000	3860	96.5			P
Iron	40,000			40,000	42900	107.2			P
Lead	4,000			4,000	3900	97.5			P
Magnesium	40,000			40,000	40600	101.5			P
Manganese	4,000			4,000	3700	92.5			P
Mercury	N/A			N/A					
Nickel	4,000			4,000	3730	93.2			P
Potassium	40,000			40,000	42300	105.8			P
Selenium	4,000			4,000	3610	90.2			P
Silver	4,000			4,000	4380	109.5			P
Sodium	40,000			40,000	43000	107.5			P
Thallium	4,000			4,000	3840	96.0			P
Vanadium	4,000			4,000	3710	92.8			P
Zinc	4,000			4,000	3830	95.8			P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00007

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS-KNOXVILLE Contract: COE HOULOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic	50	46	92.0	50	54	108.0	51	102.0	E
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	50	52	104.0	50	55	110.0	46	92.0	F
Magnesium									
Manganese									
Mercury	4.0	4.0	100.0	4.0	4.0	100.0	4.1	102.5	CV
Nickel									
Potassium									
Selenium	50	48	96.0	50	48	96.0	49	98.0	F
Silver									
Sodium									
Thallium									F
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00008

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic									
Barium									E
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									F
Magnesium									
Manganese									
Mercury				4.0	4.0	100.0			CV
Nickel									
Potassium									
Selenium				50	47	94.0	48	96.0	F
Silver									
Sodium									
Thallium									F
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic									
Barium									E
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									F
Magnesium									
Manganese									
Mercury									CV
Nickel									
Potassium									
Selenium				50	52	104.0	50	100.0	F
Silver									
Sodium									
Thallium									F
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

2B

CRDL STANDARD FOR AA AND ICP

00010

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: TNA 44534 SAS No.: _____ SDG No.: MW-041189

AA CRDL Standard Source: NBS

ICP CRDL Standard Source: NBS

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony				120	109	90.8	107	89.2
Arsenic	20	20	100.0	* 60	65	108.3	49	81.7
Barium								
Beryllium				10	10	100.0	9	90.0
Cadmium				10	11	110.0	9	90.0
Calcium								
Chromium				20	21	105.0	18	90.0
Cobalt				100	101	101.0	99	99.0
Copper				50	50	100.0	48	96.0
Iron								
Lead	10	11	110.0	* 60	62	103.3	57	95.0
Magnesium								
Manganese				30	29	96.7	27	90.0
Mercury	0.4	0.4	100.0					
Nickel				80	88	110.0	71	88.8
Potassium								
Selenium	10	10	100.0	* 120	116	96.7	124	103.3
Silver				20	22	110.0	14	70.0
Sodium								
Thallium	20			* 60	48	80.0	56	93.3
Vanadium				100	96	96.0	91	91.0
Zinc				40	44	110.0	40	100.0

*Two times the CRDL is below the instrument detection limit.
Starred elements are at two times the IDL.

U.S. EPA - CLP

3
BLANKS

00011

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: NW-041189

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	P PBW C1014 F PBW ____ Preparation Blank	C	M
Aluminum	40	U	40	U	40	U	40	U	49	B	P
Antimony	30	U	30	U	30	U	30	U	30	U	P
Arsenic	30	U	30	U	30	U	30	U	30	U	P
Barium	2	U	2	U	2	U	2	U	3	B	P
Beryllium	1	U	1	U	1	U	1	U	1	U	P
Cadmium	5	U	5	U	5	U	5	U	5	U	P
Calcium	30	U	30	U	30	U	30	U	45	B	P
Chromium	10	U	10	U	10	U	10	U	10	U	P
Cobalt	20	U	20	U	20	U	20	U	20	U	P
Copper	10	U	10	U	10	U	10	U	10	U	P
Iron	10	U	10	U	10	U	10	U	51	B	P
Lead	30	U	30	U	30	U	30	U	30	U	P
Magnesium	30	U	30	U	30	U	30	U	49	B	P
Manganese	2	U	2	U	2	U	2	U	2	U	P
Mercury									NR		V
Nickel	20	U	20	U	20	U	20	U	20	U	P
Potassium	1000	U	1000	U	1000	U	1000	U	1000	U	P
Selenium	60	U	60	U	60	U	60	U	60	U	P
Silver	5	U	5	U	5	U	5	U	5	U	P
Sodium	200	U	200	U	200	U	200	U	200	U	P
Thallium	30	U	30	U	30	U	30	U	30	U	P
Vanadium	10	U	10	U	10	U	10	U	10	U	P
Zinc	5	U	5	U	5	U	5	U	7	B	P
Cyanide											

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3
BLANKS

00012

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	PBW C1015 Preparation Blank	C	M
Aluminum											
Antimony											
Arsenic	2	U	2	U	2	U			2	U	E
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead	2	U	2	U	2	U			2	U	E
Magnesium											
Manganese											
Mercury	0.2	U	0.2	U	0.2	U	0.2	U	NR		CV
Nickel											
Potassium											
Selenium	2	U	2	U	2	U	2	U	2	U	E
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No: 44534 ITNA SAS No.: _____ SDG No.: MW-041189

ICP ID Number: JA1100 ICS Source: SPEX

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	500000	485000	468000	474000		434000	439000	
Antimony								
Arsenic								
Barium		471		463	98.3		426	90.4
Beryllium		520		487	93.6		446	85.8
Cadmium		990		819	82.7		803	81.1
Calcium	500000	509000	480000	526000		451000	460000	
Chromium		452		433	95.8		408	90.3
Cobalt		459		420	91.5		407	88.7
Copper		441		415	94.1		394	89.3
Iron	200000	188000	179000	189000		164000	173000	
Lead		1010		956	94.6		963	95.4
Magnesium	500000	495000	481000	481000		444000	444000	
Manganese		451		406	90.0		392	86.9
Mercury								
Nickel		863		831	96.3		781	90.5
Potassium								
Selenium								
Silver		909		866	95.3		840	92.4
Sodium								
Thallium								
Vanadium		467		450	96.4		437	93.6
Zinc		920		851	92.5		810	88.0

U.S. EPA - CLP

00015

7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44534_____ SAS No.: _____ SDG No.: MW-041189_

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

LCSW C1016

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	20000.0	18915.47	94.6						
Antimony	4000.0	3688.97	92.2						
Arsenic	4000.0	3609.86	90.2						
Barium	4000.0	3798.23	95.0						
Beryllium	4000.0	3858.12	96.5						
Cadmium	4000.0	3647.90	91.2						
Calcium	20000.0	20005.93	100.0						
Chromium	4000.0	3716.76	92.9						
Cobalt	4000.0	3645.82	91.1						
Copper	4000.0	3449.64	86.2						
Iron	20000.0	20491.35	102.5						
Lead	4000.0	3682.65	92.1						
Magnesium	20000.0	19179.00	95.9						
Manganese	4000.0	3353.58	83.8						
Mercury									
Nickel	4000.0	3578.48	89.5						
Potassium	20000.0	19619.97	98.1						
Selenium	4000.0	3566.66	89.2						
Silver	4000.0	2283.96	57.1						
Sodium	20000.0	19463.91	97.3						
Thallium	4000.0	3486.38	87.2						
Vanadium	4000.0	3478.39	87.0						
Zinc	4000.0	3682.49	92.1						
Boron									

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

00016

GFAA & CVAA ONLY

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-04118

Solid LCS Source: SPEX

Aqueous LCS Source: SPEX

Analyte	LCSW 11017 Aqueous (ug/L) True	Found	%R	LCSS Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic	40	38	95.0	4.0			3.2	4.8	
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20	19	95.0	2.0			1.6	2.4	
Magnesium									
Manganese									
Mercury	NR			0.20			0.16	0.24	
Nickel									
Potassium									
Selenium	20	20	100.0	2.0			1.6	2.4	
Silver									
Sodium									
Thallium	40			4.0			3.2	4.8	
Vanadium									
Zinc									
Cyanide									

ACCEPTANCE LIMITS: 80.0 - 120.0 %R

NR = NOT REQUIRED

U.S. EPA - CLP

00017

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

S-041189

Lab Name: ITAS KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-041189

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium	22	B					
Beryllium							
Cadmium	5	U					
Calcium							
Chromium	10	U					
Cobalt							
Copper							
Iron	273						
Lead							
Magnesium							
Manganese	7	B					
Mercury							
Nickel							
Potassium							
Selenium							
Silver	5	U					
Sodium	7,920,000		10,300,000		30.0	E	P
Thallium							
Vanadium							
Zinc							

U.S. EPA - CLP

10
HOLDING TIMES

00018

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44534 SAS No.: _____ SDG No.: MW-04118

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
MW-041189	WATER	11-07-89	11-15-89	8 DAYS		
MW-061189	WATER	11-07-89	11-15-89	8 DAYS		
S-041189	WATER	11-07-89	11-15-89	8 DAYS		

U.S. EPA - CLP

00019

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44534_____ SAS No.: _____ SDG No.: MW-041189_

ICP ID Number: JA1100_____ Date: 10/01/09

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

FORM XI - IN

U.S. EPA - CLP

00020

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44534_____ SAS No.: _____ SDG No.: MW-041189_

ICP ID Number: _____ Date: 10/01/09

Flame AA ID Number : _____

Furnace AA ID Number : 12E/188_____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	196.00		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	217.00		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

00021

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44534 SAS No.: SDG No.: MW-041189

ICP ID Number: Date: 10/01/09

Flame AA ID Number :

Furnace AA ID Number : 5100/600

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.0	F
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

00022

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44534_____ SAS No.: _____ SDG No.: MW-041189_

ICP ID Number: _____ Date: 10/01/09

Flame AA ID Number : 151_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

00023

12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44534_____ SAS No.: _____ SDG No.: MW-041189_

ICP ID Number: JA1100_____ Date: 10/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	AS
Aluminum	308.20					
Antimony	206.80					
Arsenic	193.60	0.0103600		0.0013600		
Barium	493.40					
Beryllium	313.00					
Cadmium	228.80					
Calcium	317.90					0.0055600
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30	0.0006800				
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0103900		
Vanadium	292.40					
Zinc	213.80					

Comments:

FORM XII (PART 1) - IN

U.S. EPA - CLP

00024

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44534_____ SAS No.: _____ SDG No.: MW-041189_

ICP ID Number: JA1100_____ Date: 10/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : BA	BE	CO	CR	NI
Aluminum	308.20					
Antimony	206.80				0.0055800	
Arsenic	193.60	0.0006600		0.0005200		
Barium	493.40					
Beryllium	313.00				0.0002800	0.0001200
Cadmium	228.80		0.0025800			
Calcium	317.90					
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30					
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0018300		
Vanadium	292.40					
Zinc	213.80					0.0032600

Comments:

FORM XII (PART 2) - IN

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE Contract: COE_HOLLOMANAFB

Lab Code: ITSTU Case No.: 44534 SAS No.: SDG No.: MW-041189

ICP ID Number: JA1100 Date: 10/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : V				
Aluminum	308.20	0.0218400	-999999.00	-999999.00	-999999.00	-999999.00
Antimony	206.80		-999999.00	-999999.00	-999999.00	-999999.00
Arsenic	193.60	0.0128200	-999999.00	-999999.00	-999999.00	-999999.00
Barium	493.40		-999999.00	-999999.00	-999999.00	-999999.00
Beryllium	313.00	0.0062300	-999999.00	-999999.00	-999999.00	-999999.00
Cadmium	228.80		-999999.00	-999999.00	-999999.00	-999999.00
Calcium	317.90		-999999.00	-999999.00	-999999.00	-999999.00
Chromium	267.70		-999999.00	-999999.00	-999999.00	-999999.00
Cobalt	228.60		-999999.00	-999999.00	-999999.00	-999999.00
Copper	324.70		-999999.00	-999999.00	-999999.00	-999999.00
Iron	259.90		-999999.00	-999999.00	-999999.00	-999999.00
Lead	220.30		-999999.00	-999999.00	-999999.00	-999999.00
Magnesium	279.00		-999999.00	-999999.00	-999999.00	-999999.00
Manganese	257.60		-999999.00	-999999.00	-999999.00	-999999.00
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60		-999999.00	-999999.00	-999999.00	-999999.00
Potassium	766.00		-999999.00	-999999.00	-999999.00	-999999.00
Selenium	196.00		-999999.00	-999999.00	-999999.00	-999999.00
Silver	328.00		-999999.00	-999999.00	-999999.00	-999999.00
Sodium	588.90		-999999.00	-999999.00	-999999.00	-999999.00
Thallium	190.80	0.0019670	-999999.00	-999999.00	-999999.00	-999999.00
Vanadium	292.40		-999999.00	-999999.00	-999999.00	-999999.00
Zinc	213.80		-999999.00	-999999.00	-999999.00	0.0000000

Comments:

FORM XII (PART 2) - IN

U.S. EPA - CLP

13

ICP LINEAR RANGES (QUARTERLY)

00026

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44534_____ SAS No.: _____ SDG No.: MW-041189_

ICP ID Number: JA1100_____ Date: 10/01/89

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	
Antimony	6.00	15000.0	
Arsenic	6.00	15000.0	
Barium	6.00	15000.0	
Beryllium	6.00	15000.0	
Cadmium	6.00	15000.0	
Calcium	6.00	500000.0	
Chromium	6.00	15000.0	
Cobalt	6.00	15000.0	
Copper	6.00	40000.0	
Iron	6.00	500000.0	
Lead	6.00	40000.0	
Magnesium	6.00	500000.0	
Manganese	6.00	40000.0	
Mercury			NR
Nickel	6.00	15000.0	
Potassium	6.00	500000.0	
Selenium	6.00	15000.0	
Silver	6.00	15000.0	
Sodium	6.00	900000.0	
Thallium	6.00	15000.0	
Vanadium	6.00	12000.0	
Zinc	6.00	40000.0	

Comments:

&&xxfcxExExExxxxxHpFxxExExExE

FORM XIII - IN

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

December 1, 1989

Job Number: ITNA 44544

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	11/08/89
Number of Samples:	Six (6)
Sample Type:	Water

I. Introduction

On 11/08/89, six (6) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report is included.

The samples were analyzed for total organic carbon (TOC) at the IT-Mixed Waste Laboratory (IT-MWL). A separate laboratory report is included.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

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DEC 11 1989
IT CORP. ALBUQUERQUE

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

II. Analytical Results/Methodology (continued)

Th samples were analyzed for phenols by colorimetric determination using EPA SW-846 method 9065.

The samples were analyzed for nitrate and nitrite by colorimetric determination using EPA method 353.3.

The samples were analyzed for requested anions by ion chromatography using EPA method 300.0.

The samples were analyzed for fluoride by potentiometric determination using EPA method 340.2.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were extracted for pesticides and herbicides on 11/09/89. The samples were analyzed on 11/14/89 and 11/15/89. No problems were encountered.

The phenol analyses were performed on 11/15/89. No problems were encountered.

The nitrate and nitrite analyses were performed on 12/01/89. No problems were encountered.

The anion analyses were performed on 11/28/89. No problems were encountered.

The fluoride determination was performed on 11/10/89. No problems were encountered.

International Technology
December 1, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44544

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	Method Blank	MW-021189	MW-031189
Lab Sample ID:	BLA0066/A0071	JJ9000/JJ9006	JJ9001/JJ9007
Lindane	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/09/89
Date Analyzed: 11/14/89 and 11/15/89

International Technology
December 1, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44544

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	MW-051189	MW-071189	MW-121189	S-021189
Lab Sample ID:	JJ9002/JJ9008	JJ9003/JJ9009	JJ9004/JJ9010	JJ9005/JJ9011
Lindane	0.1 U	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/09/89
Date Analyzed: 11/14/89 and 11/15/89

International Technology
December 1, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44544

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	Method Blank	MW-021189	MW-031189	
Lab Sample ID:	P0623/P0678/P0677 P0612/P0649	JJ8976/JJ8988/ JJ8982	JJ8977/JJ8989/ JJ8983	Analysis Date
Phenols	0.01 U	0.01 U	0.01 U	11/15/89
Nitrate, as N	0.05 U	0.05	0.05 U	12/01/89
Nitrite, as N	0.01 U	0.01 U	0.01 U	12/01/89
Fluoride	0.1 U	1.4	1.5	11/10/89
Chloride	0.5 U	1,100	4,900	11/28/89
Sulfate	1.5 U	2,200	4,000	11/28/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
December 1, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44544

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	MW-051189 JJ8978/JJ8990 JJ8984	MW-071189 JJ8979/JJ8991/ JJ8985	MW-121189 JJ8980/JJ8992/ JJ8986	Analysis Date
Phenols	0.01 U	0.01 U	0.01 U	11/15/89
Nitrate, as N	0.05 U	0.05 U	3.4	12/01/89
Nitrite, as N	0.01 U	0.01 U	0.02	12/01/89
Fluoride	2.3	2.3	3.8	11/10/89
Chloride	3,300	1,100	1,200	11/28/89
Sulfate	2,400	2,300	3,300	11/28/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
December 1, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44544

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	S-021189	
Lab Sample ID:	JJ8981/JJ8993 JJ8987	Analysis Date
Phenols	0.01 U	11/15/89
Nitrate, as N	3.4	12/01/89
Nitrite, as N	0.02	12/01/89
Fluoride	4.1	11/10/89
Chloride	1,200	11/28/89
Sulfate	3,200	11/28/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology Corp.
ITAS-Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Attn: Alyce Moore

Date: December 4, 1989

ITMWL Job Number: ITAB 35701
ITSTU Job Number: ITNA 44544

This is the Certificate of Analysis for the following samples:

Client Project ID:	ITNA 44544
Date Received by Lab:	11/10/89
Number of Samples:	Six (6)
Sample Type:	Water

I. Introduction

On November 10, 1989, six (6) water samples arrived at the ITAS Oak Ridge, Tennessee laboratory from ITAS-Knoxville, Knoxville, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. Analytical Results/Methodology

The samples were analyzed for Total Organic Carbon. Results are presented in the following report and were determined using Method 9060, Test Methods for Evaluating Solid Waste, USEPA SW-846, 3rd edition, 1986.

Reviewed and Approved

Snell A. Mills III

Snell A. Mills III
Laboratory Manager

SAM/sca

ITAS-Knoxville
ATTN: Alyce Moore
Date: December 4, 1989

Job Number: ITAB 35701

Date Received: 11/10/89

Sample Description: Water Concentration Units: mg/L

Client ID: MW-021189, MW-031189, MW-051189, MW-071189, MW-121189, S-021189
IT-MWL ID: MM1474, MM1475, MM1476, MM1477, MM1478, MM1479, BLANK
IT-STU ID: JJ8970, JJ8971, JJ8972, JJ8973, JJ8974, JJ8975

Prep and Anal Date: 11/14/89

T O C

Client ID:	MW-021189	MW-031189	MW-051189	MW-071189	MW-121189	BLANK 1
Average Result:	10.0	21.2	10.1	5.73	13.3	1.10
Sample Range:	9.84-10.5	20.2-22.4	9.48-10.7	5.52-6.14	13.0-13.7	<1.00-2.49

Client ID:	BLANK 2*
Average Result:	1.49
Sample Range:	<1.00-3.11

* BLANK 2 for MS/MSD only.

CLIENT ID:	RUN #1	RUN #2	RUN #3	RUN #4
S-021189**	7.81	8.23	8.12	8.12
SAMPLE RANGE:	7.68-7.90	7.99-8.63	7.75-8.52	8.03-8.35

** This sample requested reporting in quadruplicate.

Matrix Spike and Matrix Spike Duplicate % Recoveries

Client ID: MW-021189

% Matrix Spike	% Matrix Spike Duplicate
101	97

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DEC 5

 ITRSL Oak Ridge REPORT Work Order # R9-11-054
Received: 11/08/89 11/30/89 18:05:07

REPORT TO: IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN: JANICE STERRETT

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

ATTEN: ERS
PHONE: 615-482-9707

CERTIFIED BY

CONTACT: JIM DILLARD

CLIENT: ITAS SAMPLES: 6
COMPANY: IT CORPORATION/MIDDLEBROOK
FACILITY: MIDDLEBROOK PIKE

WORK ID: WATER SAMPLES / ITNA 44544
TAKEN:
TRANS:
TYPE:
P.O. #: 486000
INVOICE: under separate cover

	SAMPLE IDENTIFICATION
01	JJ9012
02	JJ9013
03	JJ9014
04	JJ9015
05	JJ9016
06	JJ9017

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETAW	GROSS BETA
RA226	RA-226
RA228	RA-228
SPEC	SPECIAL FORM FOR REPORTING

SAMPLE ID JJ9012 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 11/07/89 Category 145325

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<60		pCi/l
GROSS BETA	<50		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/4/89	BETA: 12/1/89	
RA-226	<5.0		pCi/l
RA-228	<5.0		pCi/l
PREPARED ON:	11/15/89		
COUNTED ON:	11/15/89	11/21/89	

SAMPLE ID JJ9013 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 11/07/89 Category 145325

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<120		pCi/l
GROSS BETA	<120		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/4/89	BETA: 12/1/89	
RA-226	<5.0		pCi/l
RA-228	<5.0		pCi/l
PREPARED ON:	11/15/89		
COUNTED ON:	11/15/89	11/21/89	

SAMPLE ID JJ9014 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 11/07/89 Category 145325

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	65	49	pCi/l
GROSS BETA	<80		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/4/89	BETA: 12/1/89	
RA-226	<5.0		pCi/l
RA-228	<5.0		pCi/l
PREPARED ON:	11/15/89		
COUNTED ON:	11/15/89	11/21/89	

SAMPLE ID JJ9015 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 11/07/89 Category 145325

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	254	80	pCi/l
GROSS BETA	<60		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/4/89	BETA: 12/1/89	
RA-226	<5.0		pCi/l
RA-228	<5.0		pCi/l
PREPARED ON:	11/15/89		
COUNTED ON:	11/15/89	11/21/89	

SAMPLE ID JJ9016 FRACTION 05A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 11/07/89 Category 145325

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<70		pCi/l
GROSS BETA	<70		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/4/89	BETA: 12/1/89	
RA-226	<5.0		pCi/l
RA-228	<5.0		pCi/l
PREPARED ON:	11/15/89		
COUNTED ON:	11/15/89	11/21/89	

SAMPLE ID JJ9017 FRACTION 06A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 11/07/89 Category 145325

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	176	70	pCi/l
GROSS BETA	<65		pCi/l
PREPARED ON:	12/1/89		
ALPHA COUNTED ON:	12/4/89	BETA: 12/1/89	
RA-226	<5.0		pCi/l
RA-228	<5.0		pCi/l
PREPARED ON:	11/15/89		
COUNTED ON:	11/15/89	11/21/89	

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED
DEC 11 1989
IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer Dec 12/13/89

November 30, 1989

Job Number: ITNA 44544

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	11/08/89
Number of Samples:	Six (6)
Sample Type:	Water

I. Introduction

On 11/08/89, six (6) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that CLP data are not blank corrected.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

III. Quality Control

The samples were digested on 11/13/89 for ICP and GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 11/13/89; the GFAA analyses for arsenic, lead and selenium were performed from 11/14/89 through 11/25/89; the remaining metals were analyzed by ICP on 11/16/89. All run QC was acceptable. A duplicate/spike pair was analyzed using sample number MW-121189. Spike recovery (accuracy) results were outside control limits for iron, lead, manganese, silver, and selenium. A post digest spike was performed with acceptable recoveries. Duplicate RPD (precision) results were outside control limits for iron and manganese. Due to severe matrix interference problems with these samples, the arsenic and lead values have been reported by ICP.

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITMA44544 SAS No.: _____ SDG No.: MW-021189

SOW No.: 7/87

EPA Sample No.	Lab Sample ID.
MW-021189	JJ8994
MW-031189	JJ8995
MW-051189	JJ8996
MW-071189	JJ8997
MW-121189 OS	JJ8998 OS
S -021189	JJ8999
MW-121189 D	JJ9040 D
MW-121189 S	JJ9041 S

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

METALS Lab Manager: _____

Date: _____

U.S. EPA - CLP

00002

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-021189

Lab Name: TAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: TN-STU Case No.: TNA 44544 SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER Lab Sample ID: JJ8994

Level (low/med): _____ Date Received: 11/08/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				P
7440-38-2	Arsenic	30	U		P
7440-39-3	Barium	28.3	B		P
7440-41-7	Beryllium				P
7440-43-9	Cadmium	6.8			P
7440-70-2	Calcium				P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	363			P
7439-92-1	Lead	30	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese	877			P
7439-97-6	Mercury	0.2	U		V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium	40	U	W	F
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	529000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

00003

EPA SAMPLE NO.

MW-031189

Lab Name: TMAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: TMSTU Case No.: 44544 (TNA) SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER Lab Sample ID: JJ8995

Level (low/med): _____ Date Received: 11/08/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic	30	U		P
7440-39-3	Barium	17.4	B		P
7440-41-7	Beryllium				P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium				P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	962			P
7439-92-1	Lead	30	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese	1540			P
7439-97-6	Mercury	0.2	U		V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium	40	U	W	F
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	2,419,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

00001

EPA SAMPLE NO.

MW-051189

Lab Name: TAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: T-STU Case No.: 44544 (TNA) SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER Lab Sample ID: JJ8996

Level (low/med): _____ Date Received: 11/08/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic	30	U		P
7440-39-3	Barium	29.1	B		P
7440-41-7	Beryllium				P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium				P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	874			P
7439-92-1	Lead	30	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese	2030			P
7439-97-6	Mercury	0.3	U		V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium	50	U	W	F
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	1090,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

00005

EPA SAMPLE NO.

MW-071189

Lab Name: TMAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: TMS-TU Case No.: 44544 (TNA) SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER Lab Sample ID: JJ8997

Level (low/med): _____ Date Received: 11/08/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic	30	U		P
7440-39-3	Barium	23.0	B		P
7440-41-7	Beryllium				P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium				P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	183			P
7439-92-1	Lead	30	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese	1050			P
7439-97-6	Mercury	0.6		W	V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium	50	U	W	F
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	545000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

FORM I - IN

7/87

Rev. ITB Amendment One

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-121189

Lab Name: TMAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: TM-STU Case No.: 44544 (TNA) SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER Lab Sample ID: JJ8998 05

Level (low/med): _____ Date Received: 11/08/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic	30	U		P
7440-39-3	Barium	11.7	B		P
7440-41-7	Beryllium				P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium				P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	270			P
7439-92-1	Lead	30	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese	13.3			P
7439-97-6	Mercury	0.4	U		V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium	30	U	W	F
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	789000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

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00007

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

S-021189

Lab Name: TMAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: TMSTU Case No.: TNA 44544 SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER Lab Sample ID: JJ8999

Level (low/med): _____ Date Received: 11/08/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic	30	U		P
7440-39-3	Barium	11.7			P
7440-41-7	Beryllium				P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium				P
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	310			P
7439-92-1	Lead	30	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese	135			P
7439-97-6	Mercury	0.3	U	W	V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium	30	U	W	F
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	779000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40000.0	40204.1	100.5	40000.0	39027.93	97.6	40566.65	101.4	P
Antimony	4000.0	4015.43	100.4	4000.0	3906.79	97.7	4140.27	103.5	P
Arsenic	4000.0	4080.39	102.0	4000.0	3898.88	97.5	3931.86	98.3	P
Barium	4000.0	3825.56	95.6	4000.0	3696.32	92.4	3683.55	92.1	P
Beryllium	4000.0	4304.75	107.6	4000.0	4151.60	103.8	4242.62	106.1	P
Cadmium	4000.0	3821.68	95.5	4000.0	3723.60	93.1	3891.38	97.3	P
Calcium	40000.0	41723.0	104.3	40000.0	40152.79	100.4	42708.14	106.8	P
Chromium	4000.0	3834.23	95.9	4000.0	3721.78	93.0	3866.88	96.7	P
Cobalt	4000.0	3961.56	99.0	4000.0	3880.66	97.0	3989.19	99.7	P
Copper	4000.0	3879.86	97.0	4000.0	3825.24	95.6	3862.63	96.6	P
Iron	40000.0	42888.0	107.2	40000.0	41567.52	103.9	43130.83	107.8	P
Lead	4000.0	3969.06	99.2	4000.0	3845.14	96.1	4036.95	100.9	P
Magnesium	40000.0	40455.4	101.1	40000.0	39139.03	97.8	40704.62	101.8	P
Manganese	4000.0	3822.50	95.6	4000.0	3759.79	94.0	3836.37	95.9	P
Mercury	4.0	3.95	98.8	4.0	3.85	96.2	3.95	98.8	CV
Nickel	4000.0	4005.11	100.1	4000.0	3922.38	98.1	3982.88	99.6	P
Potassium	40000.0	40326.1	100.8	40000.0	39116.99	97.8	42305.57	105.8	P
Selenium	4000.0	3778.98	94.5	4000.0	3689.51	92.2	3854.24	96.4	P
Silver	4000.0	4051.16	101.3	4000.0	4108.50	102.7	4241.52	106.0	P
Sodium	40000.0	41607.4	104.0	40000.0	40394.77	101.0	42364.37	105.9	P
Thallium	4000.0	4049.55	101.2	4000.0	3869.98	96.7	4052.89	101.3	P
Vanadium	4000.0	3785.91	94.6	4000.0	3763.43	94.1	3838.52	96.0	P
Zinc	4000.0	3627.60	90.7	4000.0	3868.19	96.7	3795.72	94.9	P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44544_____ SAS No.: _____ SDG No.: MW-021189_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	40289.36	100.7	41211.49	103.0	P
Antimony				4000.0	4039.31	101.0	4147.64	103.7	P
Arsenic				4000.0	4149.92	103.7	4074.04	101.9	P
Barium				4000.0	3942.80	98.6	4140.52	103.5	P
Beryllium				4000.0	4275.51	106.9	4360.13	109.0	P
Cadmium				4000.0	4072.98	101.8	3823.26	95.6	P
Calcium				40000.0	41558.18	103.9	42306.49	105.8	P
Chromium				4000.0	4051.28	101.3	4054.61	101.4	P
Cobalt				4000.0	4201.89	105.0	3981.97	99.5	P
Copper				4000.0	4158.23	104.0	3949.19	98.7	P
Iron				40000.0	42815.74	107.0	43953.09	109.9	P
Lead				4000.0	4265.97	106.6	4007.98	100.2	P
Magnesium				40000.0	40473.45	101.2	41516.93	103.8	P
Manganese				4000.0	4063.35	101.6	3837.61	95.9	P
Mercury				4.0	3.66	91.5	3.95	98.8	CV
Nickel				4000.0	4267.97	106.7	4089.00	102.2	P
Potassium				40000.0	40932.64	102.3	41365.09	103.4	P
Selenium				4000.0	4089.59	102.2	4071.41	101.8	P
Silver				4000.0	4307.11	107.7	4078.93	102.0	P
Sodium				40000.0	40290.32	100.7	42169.23	105.4	P
Thallium				4000.0	4105.66	102.6	3904.43	97.6	P
Vanadium				4000.0	4098.96	102.5	3844.49	96.1	P
Zinc				4000.0	3964.03	99.1	4114.36	102.9	P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

Initial Calibration Source: NBS_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	40763.20	101.9			P
Antimony				4000.0	4135.21	103.4			P
Arsenic				4000.0	4178.19	104.5			P
Barium				4000.0	4326.76	108.2			P
Beryllium				4000.0	4320.22	108.0			P
Cadmium				4000.0	3863.26	96.6			P
Calcium				40000.0	42336.40	105.8			P
Chromium				4000.0	4122.66	103.1			P
Cobalt				4000.0	4075.49	101.9			P
Copper				4000.0	4132.09	103.3			P
Iron				40000.0	43759.24	109.4			P
Lead				4000.0	4078.10	102.0			P
Magnesium				40000.0	41088.29	102.7			P
Manganese				4000.0	3921.90	98.0			P
Mercury				4.0	3.85	96.2			CV
Nickel				4000.0	4208.50	105.2			P
Potassium				40000.0	40615.38	101.5			P
Selenium				4000.0	4183.71	104.6			P
Silver				4000.0	4086.74	102.2			P
Sodium				40000.0	41658.61	104.1			P
Thallium				4000.0	4093.51	102.3			P
Vanadium				4000.0	3961.83	99.0			P
Zinc				4000.0	4142.69	103.6			P
Boron									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-021189

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic									
Barium									E
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									F
Magnesium									
Manganese									
Mercury									CV
Nickel									
Potassium									
Selenium	50	48	96.0	50	48	96.0	49	98.0	F
Silver									
Sodium									
Thallium									F
Vanadium									
Zinc									
Cyanide									

1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00012

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: NW-021189

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic									F
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									F
Magnesium									
Manganese									
Mercury									CV
Nickel									
Potassium									
Selenium				50	47	94.0	48	96.0	F
Silver									
Sodium									
Thallium									F
Vanadium									
Zinc									
Cyanide									

1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

00013

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-02118

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic									
Barium									E
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									F
Magnesium									
Manganese									
Mercury									CV
Nickel									
Potassium									
Selenium				50	52	104.0	49	98.0	F
Silver									
Sodium									
Thallium									F
Vanadium									
Zinc									
Cyanide									

1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

AA CRDL Standard Source: NBS_____

ICP CRDL Standard Source: NBS_____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony				120.0	90.94	75.8	109.48	91.2
Arsenic	20.0			60.0	46.84	78.1	65.65	109.4
Barium								
Beryllium				10.0	8.94	89.4	9.81	98.1
Cadmium				10.0	8.77	87.7	11.13	111.3
Calcium								
Chromium				20.0	19.20	96.0	20.11	100.6
Cobalt				100.0	97.10	97.1	102.43	102.4
Copper				50.0	45.65	91.3	53.51	107.0
Iron								
Lead	10.0			60.0	50.35	83.9	64.70	107.8
Magnesium								
Manganese				30.0	27.23	90.8	27.82	92.7
Mercury	0.4	0.40	100.0					
Nickel				80.0	83.76	104.7	85.80	107.2
Potassium								
Selenium	10.0	10.00	100.0	120.0	114.09	95.1	133.28	111.1
Silver				20.0	19.23	96.2	10.17	50.8
Sodium								
Thallium				60.0	26.07	43.4	64.39	107.3
Vanadium				100.0	93.89	93.9	99.90	99.9
Zinc				40.0	42.79	107.0	49.55	123.9

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-021/89

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	P
Antimony	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Arsenic	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Calcium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Cobalt	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Lead	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U			CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1090.9	B	P
Selenium	60.0	U	60.0	U	60.0	U	60.0	U	60.0	U	P
Silver	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Sodium	200.0	U	200.0	U	200.0	U	200.0	U	200.0	U	P
Thallium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	11.3	B	P
Boron											NR

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3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-021189

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			40.0	U	40.0	U					P
Antimony			30.0	U	30.0	U					P
Arsenic			30.0	U	30.0	U					P
Barium			2.0	U	2.0	U					P
Beryllium			1.0	U	1.0	U					P
Cadmium			5.0	U	5.0	U					P
Calcium			30.0	U	30.0	U					P
Chromium			10.0	U	10.0	U					P
Cobalt			20.0	U	20.0	U					P
Copper			10.0	U	10.0	U					P
Iron			10.0	U	10.0	U					P
Lead			30.0	U	30.0	U					P
Magnesium			30.0	U	30.0	U					P
Manganese			2.0	U	2.0	U					P
Mercury			0.2	U	0.2	U					CV
Nickel			20.0	U	20.0	U					P
Potassium			1000.0	U	1000.0	U					P
Selenium			60.0	U	60.0	U					P
Silver			5.0	U	5.0	U					P
Sodium			200.0	U	200.0	U					P
Thallium			30.0	U	30.0	U					P
Vanadium			10.0	U	10.0	U					P
Zinc			5.0	U	5.0	U					P
Boron											NR

3
BLANKS

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-02118

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium			2	U	2	U	2	U			
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

ICP ID Number: JA1100_____ ICS Source: SPEX_____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Aluminum	500000	485000	465819	465188.6	95.9	475323	478011.0	98.6
Antimony								
Arsenic								
Barium		471		448.5	95.2		534.6	113.5
Beryllium		520		482.0	92.7		495.2	95.2
Cadmium		990		840.1	84.9		813.4	82.2
Calcium	500000	509000	479552	481157.6	94.5	489139	495215.3	97.3
Chromium		452		422.8	93.5		463.7	102.6
Cobalt		459		419.4	91.4		433.4	94.4
Copper		441		453.5	102.8		456.1	103.4
Iron	200000	188000	179073	186075.7	99.0	183343	191435.0	101.8
Lead		1010		961.0	95.1		949.7	94.0
Magnesium	500000	495000	480844	474472.2	95.9	488828	486077.8	98.2
Manganese		451		407.1	90.3		417.5	92.6
Mercury								
Nickel		863		819.5	95.0		840.9	97.4
Potassium								
Selenium								
Silver		909		847.6	93.2		861.6	94.8
Sodium								
Thallium								
Vanadium		467		455.9	97.6		465.2	99.6
Zinc		920		892.8	97.0		935.6	101.7

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00020

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB MW-121189

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER ICAP ONLY Level (low/med): _____

LAB SAMPLE ID JJ9041S

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum						2000			p
Antimony						500			p
Arsenic	75-125	1710		30	U	2000	85.5		p
Barium	75-125	1760		11.7		2000	87.4		p
Beryllium						50			p
Cadmium	75-125	39		5.0	U	50	78.0		p
Calcium						NR			p
Chromium	75-125	155		10	U	200	77.5		p
Cobalt						500			p
Copper						250			p
Iron	75-125	1900		270		1000	1163.0	N	p
Lead	75-125	371		30	U	500	74.2	N	p
Magnesium						NR			p
Manganese	75-125	3440		133		500	1661.4	N	p
Mercury						N/A			cv
Nickel						500			p
Potassium						NR			p
Selenium						2000			p
Silver	75-125	20		5	U	50	40.0	N	p
Sodium		748000		789000		NR			p
Thallium						2000			p
Vanadium						500			p
Zinc						500			p
Cyanide									

Comments:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: Coe Hollowman MW-121189

Lab Code: IT-STU Case No.: ~~44544~~ ITNA SAS No.: _____ SDG No.: MW-02118

Matrix (soil/water): WATER GFAA & CVAA ONLY Level (low/med): _____

LAB SAMPLE ID JJ9041 S

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									p
Antimony									p
Arsenic				11-28-89 ~~30~~	~~U~~	40			p
Barium									p
Beryllium									p
Cadmium									p
Calcium									p
Chromium									p
Cobalt									p
Copper									p
Iron									p
Lead						20			p
Magnesium									p
Manganese									p
Mercury	75-125	0.9		0.4	U	1	90.0		cv
Nickel									p
Potassium									p
Selenium	75-125	4		30	U	10	40.0	N	p
Silver									p
Sodium									p
Thallium						50			p
Vanadium									p
Zinc									p
Cyanide									

Comments:

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

00022

EPA SAMPLE NO.

MW-121189

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron		1170		270		1000	90.0		P
Lead		426		30	U	500	85.2		P
Magnesium									
Manganese		534		133		500	80.2		P
Mercury									
Nickel									
Potassium									
Selenium		11		30	U	10	110.0		F
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

Comments:

U.S. EPA - CLP

6
DUPLICATES
ICAP ONLY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB MW-121189

Lab Code: IT-STU Case No.: 44544 (ITNA) SAS No.: _____ SDG No.: MW02118

Matrix (soil/water): WATER Level (low/med): _____

% Solids for Sample: 0 % Solids for Duplicate: 0

LAB SAMPLE ID JJ8998 05 LAB SAMPLE ID JJ9040 D

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	difference	Q	M
Aluminum								p
Antimony								p
Arsenic		30	U	30	U			p
Barium		11.9	B	11.9	B			p
Beryllium								p
Cadmium		5.0	U	5.0	U			p
Calcium								p
Chromium								p
Cobalt								p
Copper								p
Iron	±100 ug/L	270		558		288	*	p
Lead		38	U	38	U			p
Magnesium								p
Manganese	±20% RPD	133		1220		160.7	*	p
Mercury								cv
Nickel								p
Potassium								p
Selenium								p
Silver		5.0	U	5.0	U			p
Sodium	±20% RPD	789000		780000		1.1		p
Thallium								p
Vanadium								p
Zinc								p
Cyanide								

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6
DUPLICATES
GFAA & CVAA ONLY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN MF MW-121189

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-021189

Matrix (soil/water): WATER Level (low/med): _____

% Solids for Sample: 0 % Solids for Duplicate: 0

LAB SAMPLE ID JJ 8998 OS LAB SAMPLE ID JJ 9040 D

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	difference	Q	M
Aluminum								
Antimony								
Arsenic								F
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								F
Magnesium								
Manganese								
Mercury		0.4	U	0.6	U			V
Nickel								
Potassium								
Selenium		.30	U	.30	U			F
Silver								
Sodium								
Thallium								F
Vanadium								
Zinc								
Cyanide								

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7

00025

LABORATORY CONTROL SAMPLE

GFAA & CVAA ONLY

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-02

Solid LCS Source: SPEX

Aqueous LCS Source: SPEX

Analyte	LCSW C0990 Aqueous (ug/L) True	Found	%R	LCSS Solid (mg/kg)* True	Found	C	Limits		%R
Aluminum	20,000	19200	96.0	2,000			1600	2400	
Antimony	4000	3710	92.8	400			320	480	
Arsenic	4000	3710	92.8	400			320	480	
Barium	4000	4030	100.8	400			320	480	
Beryllium	4000	3970	99.2	400			320	480	
Cadmium	4000	4020	100.5	400			320	480	
Calcium	20,000	21100	105.5	2,000			1600	2400	
Chromium	4000	3870	96.8	400			320	480	
Cobalt	4000	4170	104.2	400			320	480	
Copper	4000	3780	94.5	400			320	480	
Iron	20,000	19700	98.5	2,000			1600	2400	
Lead	4000	3610	90.2	400			320	480	
Magnesium	20,000	19900	99.5	2,000			1600	2400	
Manganese	4000	3560	89.0	400			320	480	
Mercury	NR	NR	NR	NR	NR		NR	NR	NR
Nickel	4000	3880	97.0	400			320	480	
Potassium	20,000	22600	113.0	2,000			1600	2400	
Selenium	4000	3620	90.5	400			320	480	
Silver	4000	3510	87.8	400			320	480	
Sodium	20,000	19800	99.0	2,000			1600	2400	
Thallium	4000	4050	101.2	400			320	480	
Vanadium	4000	3850	96.2	400			320	480	
Zinc	4000	4000	100.0	400			320	480	
Cyanide									

* 100ml/1.00g Conversion

ACCEPTANCE LIMITS: 80.0-120.0% except Silver and Antimony

NR = NOT REQUIRED

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00026

7

LABORATORY CONTROL SAMPLE

GFAA & CVAA ONLY

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-02118

Solid LCS Source: SPEX

Aqueous LCS Source: SPEX

Analyte	LCSW C0999 Aqueous (ug/L) True	Found	%R	LCSS Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic	40			4.0			3.2	4.8	
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20			2.0			1.6	2.4	
Magnesium									
Manganese									
Mercury	NR			0.20			0.16	0.24	
Nickel									
Potassium									
Selenium	20	24	120.0	2.0			1.6	2.4	
Silver									
Sodium									
Thallium	40			4.0			3.2	4.8	
Vanadium									
Zinc									
Cyanide									

ACCEPTANCE LIMITS: 80.0 - 120.0 %R

NR = NOT REQUIRED

U.S. EPA - CLP

8

STANDARD ADDITION RESULTS

00027

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-021189

Concentration Units: ug/L

EPA Sample No.	An	Dil	0 ADD CON	1 ADD CON	1 ADD CON	2 ADD CON	2 ADD CON	3 ADD CON	3 ADD CON	Final Conc.	r	Q

NOT APPLICABLE

STANDARD ADDITION RESULTS ARE CALCULATED USING THE SAMPLE CONCENTRATIONS AND NOT THE SAMPLE ABSORBANCES.

U.S. EPA - CLP

00028

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

Lab Name: ITAS KNOXVILLE Contract: COE HOLLOMAN AFB MW-051189

Lab Code: ITSTU Case No.: ITNA 44544 SAS No.: _____ SDG No. MW-021189

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

W18996

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium	29.1	B					
Beryllium							
Cadmium	5	U					
Calcium							
Chromium	10	U					
Cobalt							
Copper							
Iron	874		1030		17.8		P
Lead							
Magnesium							
Manganese	2030		2420		19.2		P
Mercury							
Nickel							
Potassium							
Selenium							
Silver	5	U					
Sodium	1,090,000		1,419,000		30.2		P
Thallium							
Vanadium							
Zinc							

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10
HOLDING TIMES

00029

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-0211

EPA Sample No.	Matrix	Date Received 11-28-89	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
MW-021189	WATER	11-08-89	11-13-89	5 DAYS		
MW-031189	WATER	11-08-89	11-13-89	5 DAYS		
MW-051189	WATER	11-08-89	11-13-89	5 DAYS		
MW-071189	WATER	11-08-89	11-13-89	5 DAYS		
MW-121189	WATER	11-08-89	11-13-89	5 DAYS		
S -021189	WATER	11-08-89	11-13-89	5 DAYS		

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11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

ICP ID Number: JA1100_____ Date: 10/01/89

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

FORM XI - IN

U.S. EPA - CLP

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

ICP ID Number: _____ Date: 10/01/89

Flame AA ID Number : _____

Furnace AA ID Number : 5100/600____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	196.00		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.0	F
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

00032

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

ICP ID Number: _____ Date: 10/01/89

Flame AA ID Number : _____

Furnace AA ID Number : 12E/188_____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	196.00		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	217.00		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

ICP ID Number: _____ Date: 10/01/89

Flame AA ID Number : 151_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

ICP ID Number: JA1100_____ Date: 10/01/89

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	AS
Aluminum	308.20					
Antimony	206.80					
Arsenic	193.60	0.0103600		0.0013600		
Barium	493.40					
Beryllium	313.00					
Cadmium	228.80					
Calcium	317.90					0.0055600
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30	0.0006800				
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0103900		
Vanadium	292.40					
Zinc	213.80					

Comments:

FORM XII (PART 1) - IN

U.S. EPA - CLP

12B
ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

ICP ID Number: JA1100_____ Date: 10/01/89

Analyte	Wave-length (nm)	Interelement Correction Factors for : BA	BE	CO	CR	NI
Aluminum	308.20					
Antimony	206.80				0.0055800	
Arsenic	193.60	0.0006600		0.0005200		
Barium	493.40					
Beryllium	313.00				0.0002800	0.0001200
Cadmium	228.80		0.0025800			
Calcium	317.90					
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30					
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0018300		
Vanadium	292.40					
Zinc	213.80					0.0032600

Comments:

FORM XII (PART 2) - IN

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44544_____ SAS No.: _____ SDG No.: MW-021189_

ICP ID Number: JA1100_____ Date: 10/01/89

Analyte	Wave-length (nm)	Interelement Correction Factors for : V_	__	__	__	__
Aluminum	308.20	0.0218400	-999999.00	-999999.00	-999999.00	-999999.00
Antimony	206.80		-999999.00	-999999.00	-999999.00	-999999.00
Arsenic	193.60	0.0128200	-999999.00	-999999.00	-999999.00	-999999.00
Barium	493.40		-999999.00	-999999.00	-999999.00	-999999.00
Beryllium	313.00	0.0062300	-999999.00	-999999.00	-999999.00	-999999.00
Cadmium	228.80		-999999.00	-999999.00	-999999.00	-999999.00
Calcium	317.90		-999999.00	-999999.00	-999999.00	-999999.00
Chromium	267.70		-999999.00	-999999.00	-999999.00	-999999.00
Cobalt	228.60		-999999.00	-999999.00	-999999.00	-999999.00
Copper	324.70		-999999.00	-999999.00	-999999.00	-999999.00
Iron	259.90		-999999.00	-999999.00	-999999.00	-999999.00
Lead	220.30		-999999.00	-999999.00	-999999.00	-999999.00
Magnesium	279.00		-999999.00	-999999.00	-999999.00	-999999.00
Manganese	257.60		-999999.00	-999999.00	-999999.00	-999999.00
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60		-999999.00	-999999.00	-999999.00	-999999.00
Potassium	766.00		-999999.00	-999999.00	-999999.00	-999999.00
Selenium	196.00		-999999.00	-999999.00	-999999.00	-999999.00
Silver	328.00		-999999.00	-999999.00	-999999.00	-999999.00
Sodium	588.90		-999999.00	-999999.00	-999999.00	-999999.00
Thallium	190.80	0.0019670	-999999.00	-999999.00	-999999.00	-999999.00
Vanadium	292.40		-999999.00	-999999.00	-999999.00	-999999.00
Zinc	213.80		-999999.00	-999999.00	-999999.00	0.0000000

Comments:

13

ICP LINEAR RANGES (QUARTERLY)

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44544 SAS No.: _____ SDG No.: MW-021173

ICP ID Number: JA1100 Date: 10/01/89

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	5	506000	P
Antimony	5	9960	P
Arsenic	5	9930	P
Barium	5	9880	P
Beryllium	5	9970	P
Cadmium	5	9870	P
Calcium	5	504000	P
Chromium	5	9880	P
Cobalt	5	9850	P
Copper	5	102000	P
Iron	5	200000	P
Lead	5	9840	P
Magnesium	5	506000	P
Manganese	5	9840	P
Mercury			
Nickel	5	9900	P
Potassium	5	196000	P
Selenium	5	9930	P
Silver	5	9900	P
Sodium	5	200000	P
Thallium	5	9800	P
Vanadium	5	10400	P
Zinc	5	101000	P

Comments:

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

December 1, 1989

Job Number: ITNA 44561

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	11/09/89
Number of Samples:	Two (2)
Sample Type:	Water

I. Introduction

On 11/09/89, two (2) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for total organic carbon (TOC) at the IT-Mixed Waste Laboratory (IT-MWL). A separate laboratory report is included.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

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American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

II. Analytical Results/Methodology (continued)

Th samples were analyzed for phenols by colorimetric determination using EPA SW-846 method 9065.

The samples were analyzed for nitrate and nitrite by colorimetric determination using EPA method 353.3.

The samples were analyzed for requested anions by ion chromatography using EPA method 300.0.

The samples were analyzed for fluoride by potentiometric determination using EPA method 340.2.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were extracted for pesticides and herbicides on 11/10/89. The samples were analyzed on 11/14/89. No problems were encountered.

The phenol analyses were performed on 11/15/89. No problems were encountered.

The nitrate and nitrite analyses were performed on 12/01/89. No problems were encountered.

The anion analyses were performed on 11/28/89. No problems were encountered.

The fluoride determination was performed on 11/10/89. No problems were encountered.

International Technology
December 1, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44561

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	Method Blank	MW-011189	MW-081189
Lab Sample ID:	BLA0073/A0076	JJ9120/JJ9122	JJ9121/JJ9123
Lindane	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/10/89
Date Analyzed: 11/14/89

International Technology
December 1, 1989

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44561

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	Method Blank P0623/P0678/P0677 P0612/P0649	MW-011189 JJ9114/JJ9116/ JJ9118	MW-081189 JJ9115/JJ9117/ JJ9119	Analysis Date
Phenols	0.01 U	0.01 U	0.01 U	11/15/89
Nitrate, as N	0.05 U	3.8	0.05 U	12/01/89
Nitrite, as N	0.01 U	0.01 U	0.01 U	12/01/89
Fluoride	0.1 U	1.5	0.8	11/10/89
Chloride	0.5 U	30,000	3,200	11/28/89
Sulfate	1.5 U	2,400	3,200	11/28/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology Corp.
ITAS-Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Attn: Mary Tyler

Date: November 30, 1989

D Meyer 12/11/89

ITMWL Job Number: ITAB 35723
ITSTU Job Number: ITNA 44561

This is the Certificate of Analysis for the following samples:

Client Project ID:	ITNA 44561
Date Received by Lab:	11/29/89
Number of Samples:	Two (2)
Sample Type:	Water

I. Introduction

On November 29, 1989, two (2) water samples arrived at the ITAS Oak Ridge, Tennessee laboratory from ITAS-Knoxville, Knoxville, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. Analytical Results/Methodology

The samples were analyzed for Total Organic Carbon. Results are presented in the following report and were determined using Method 9060, Test Methods for Evaluating Solid Waste, USEPA SW-846, 3rd edition, 1986.

Reviewed and Approved

Snell A. Mills III

Snell A. Mills III
Laboratory Manager

SAM/rdj

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DEC 29 1989

 ITRSL Oak Ridge REPORT Work Order # R9-11-068
Received: 11/09/89 12/23/89 14:15:34

REPORT TO: IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN: JANICE STERRETT

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN: ERS
PHONE: 615-482-9707

CONTACT: JIM DILLARD

CLIENT: ITAS SAMPLES: 2
COMPANY: IT CORPORATION/MIDDLEBROOK
FACILITY: MIDDLEBROOK PIKE

WORK ID: WATER SAMPLES ITNA 44561
TAKEN:
TRANS:
TYPE:
P.O. #: 486000.04 PROJECT ITNA 44561
INVOICE: under separate cover

SAMPLE IDENTIFICATION
01 JJ9126, MW011189
02 JJ9127, MW081189

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETAW	GROSS BETA
RA226	RA-226
RA228	RA-228
SPEC	SPECIAL FORM FOR REPORTING

RECEIVED
JAN 2 1990
IT CORP.-ALBUQUERQUE

SAMPLE ID JU9126, MW011189 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 11/08/89 Category 145318

PARAMETER		RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA		<240		pCi/l
GROSS BETA		<260		pCi/l
PREPARED BY:	D.M.N.	12/01/89		
COUNTED BY:	D.M.N.	12/01/89	12/03/89	
RA-226		<5.0		pCi/l
RA-228		<5.0		pCi/l
PREPARED BY:	C.P.M.	11/28/89		
ANALYZED BY:	C.P.M.	11/28/89		

SAMPLE ID JU9127, MW091189 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 11/08/89 Category 145318

PARAMETER		RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA		<85		pCi/l
GROSS BETA		174	80	pCi/l
PREPARED BY:	D.M.N.	12/01/89		
COUNTED BY:	D.M.N.	12/01/89	12/03/89	
RA-226		<5.0		pCi/l
RA-228		<5.0		pCi/l
PREPARED BY:	C.P.M.	11/28/89		
ANALYZED BY:	C.P.M.	11/28/89		

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED

DEC 11 1989

IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer DM 12/13/89

November 30, 1989

Job Number: ITNA 44561

P.O. Number: 301251.02

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	11/09/89
Number of Samples:	Two (2)
Sample Type:	Water

I. Introduction

On 11/09/89, two (2) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that CLP data are not blank corrected.

The samples were analyzed for Target Analyte List (TAL) metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

III. Quality Control

The samples were digested on 11/15/89 for ICP and GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 11/15/89; the GFAA analyses for arsenic, lead and selenium, were performed from 11/17/89 through 11/25/89; the remaining metals were analyzed by ICP on 11/21/89. All run QC was acceptable. The GFAA detection limits are elevated due to matrix interference on these samples. Sample #MW-011189 is reported using ICP detection limits for lead and selenium.

U.S. EPA - CLP

00001

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-011189

SOW No.: 7/87

EPA Sample No.	Lab Sample ID.
MW-011189	119124
MW-021189	119125

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

METALS Lab Manager: _____

Date: _____

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

Lab Name: TMAS-KNOXVILLE Contract: Coe Holloman AFB

MW-011189

Lab Code: TMSU Case No.: 44561 (TNA) SAS No.: _____ SDG No.: MW-011189

Matrix (soil/water): WATER Lab Sample ID: JJ9124

Level (low/med): _____ Date Received: 11-09-89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

00002

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				P
7440-38-2	Arsenic	13	U	W	P
7440-39-3	Barium	45	B		F
7440-41-7	Beryllium				P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium				P
7440-47-3	Chromium	11			P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	764			P
7439-92-1	Lead	30	U		P
7439-95-4	Magnesium				P
7439-96-5	Manganese	33			P
7439-97-6	Mercury	0.3			V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium	60	U		P
7440-22-4	Silver	5	U		P
7440-23-5	Sodium	7660,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: Colorless Clarity Before: Clear Texture: _____

Color After: Colorless Clarity After: Clear Artifacts: _____

Comments:

FORM I - IN

7/87

Rev. IFB Amendment One

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-081189

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-011189

Matrix (soil/water): WATER Lab Sample ID: JJ9125

Level (low/med): _____ Date Received: 11-09-89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

00003

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				P
7440-38-2	Arsenic	5	U	W	P
7440-39-3	Barium	21	B		F
7440-41-7	Beryllium				P
7440-43-9	Cadmium	5	U		P
7440-70-2	Calcium				P
7440-47-3	Chromium	18	U		P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	144			P
7439-92-1	Lead	5		W	P
7439-95-4	Magnesium				F
7439-96-5	Manganese	519			P
7439-97-6	Mercury	0.2	U		P
7440-02-0	Nickel				V
7440-09-7	Potassium				P
7782-49-2	Selenium	35	U	W	P
7440-22-4	Silver	5	U		F
7440-23-5	Sodium	1,580,000			P
7440-28-0	Thallium				P
7440-62-2	Vanadium				F
7440-66-6	Zinc				P
	Cyanide				P

Color Before: Colorless Clarity Before: Clear Texture: _____

Color After: Colorless Clarity After: Clear Artifacts: _____

Comments:

FORM I - IN

7/87

Rev. IFB Amendment One

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00004

ICP ONLY

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 445101 SAS No.: _____ SDG No.: MW-011189

Initial Calibration Source: NBS

Continuing Calibration Source: NBS

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40,000	40600	101.5	40,000	40400	101.0	40500	101.2	P
Antimony	4,000	4190	104.8	4,000	4130	103.2	4120	103.0	P
Arsenic	4,000	3860	96.5	4,000	3810	95.2	3790	94.8	P
Barium	4,000	3760	94.0	4,000	3780	94.5	3700	92.5	P
Beryllium	4,000	4300	107.5	4,000	4260	106.5	4150	103.8	P
Cadmium	4,000	3750	93.8	4,000	3780	94.5	3720	93.0	P
Calcium	40,000	42200	105.5	40,000	41300	103.2	4190	104.8	P
Chromium	4,000	3850	96.2	4,000	3840	96.0	3850	96.2	P
Cobalt	4,000	3920	98.0	4,000	3920	98.0	3880	97.0	P
Copper	4,000	3830	95.8	4,000	3830	95.8	3840	96.0	P
Iron	40,000	43400	108.5	40,000	42900	107.2	42600	106.5	P
Lead	4,000	3860	96.5	4,000	3880	97.0	3840	96.0	P
Magnesium	40,000	40900	102.2	40,000	40200	100.5	39800	99.5	P
Manganese	4,000	3670	91.8	4,000	3680	92.0	3680	91.2	P
Mercury	N/A			N/A					
Nickel	4,000	3870	96.8	4,000	3890	97.2	3680	92.0	P
Potassium	40,000	41200	103.0	40,000	40200	100.5	41600	104.0	P
Selenium	4,000	3810	95.2	4,000	3860	96.5	3620	90.5	P
Silver	4,000	4310	107.8	4,000	4350	108.8	4320	108.0	P
Sodium	40,000	41400	103.5	40,000	42500	106.2	41700	104.2	P
Thallium	4,000	3780	94.5	4,000	3770	94.2	3810	95.2	P
Vanadium	4,000	3720	93.0	4,000	3720	93.0	3690	92.2	P
Zinc	4,000	3730	93.2	4,000	3740	93.5	3780	94.5	P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00005

ICP ONLY

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-011129

Initial Calibration Source: NBS

Continuing Calibration Source: NBS

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40,000			40,000	41100	102.8			P
Antimony	4,000			4,000	4180	104.5			P
Arsenic	4,000			4,000	3860	96.5			P
Barium	4,000			4,000	3720	93.0			P
Beryllium	4,000			4,000	4150	103.8			P
Cadmium	4,000			4,000	3770	94.2			P
Calcium	40,000			40,000	42600	106.5			P
Chromium	4,000			4,000	3880	97.0			P
Cobalt	4,000			4,000	3910	97.8			P
Copper	4,000			4,000	3860	96.5			P
Iron	40,000			40,000	42900	107.2			P
Lead	4,000			4,000	3900	97.5			P
Magnesium	40,000			40,000	40600	101.5			P
Manganese	4,000			4,000	3700	92.5			P
Mercury	N/A			N/A					
Nickel	4,000			4,000	3730	93.2			P
Potassium	40,000			40,000	42300	105.8			P
Selenium	4,000			4,000	3610	90.2			P
Silver	4,000			4,000	4380	109.5			P
Sodium	40,000			40,000	43000	107.5			P
Thallium	4,000			4,000	3840	96.0			P
Vanadium	4,000			4,000	3710	92.8			P
Zinc	4,000			4,000	3830	95.8			P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00006

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-011189

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic	50	46	92.0	50	54	108.0	51	102.0	E
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	50	52	104.0	50	55	110.0	46	92.0	F
Magnesium									
Manganese									
Mercury	4.0	4.0	100.0	4.0	4.0	100.0	4.1	102.5	CV
Nickel									
Potassium									
Selenium	50	54	108.0	50	50	100.0	50	100.0	F
Silver									
Sodium									
Thallium									F
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00007

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 446561 SAS No.: _____ SDG No.: MW-011189

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic									E
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									F
Magnesium									
Manganese									
Mercury				4.0	4.0	100.0			CV
Nickel									
Potassium									
Selenium				50	50	100.0	45	90.0	F
Silver									
Sodium									
Thallium									F
Vanadium									
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00008

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-011189

Initial Calibration Source: NBS

Continuing Calibration Source: SPEX

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									
Antimony									
Arsenic									
Barium									E
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									F
Manganese									
Mercury									
Nickel									CV
Potassium									
Selenium				50	43	90.0	45	90.0	F
Silver									
Sodium									
Thallium									
Vanadium									F
Zinc									
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

CRDL STANDARD FOR AA AND ICP

00009

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-C111

AA CRDL Standard Source: NBS

ICP CRDL Standard Source: NBS

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony				120	109	90.8	107	89.2
Arsenic	20	20	100.0	* 60	65	108.3	49	81.7
Barium								
Beryllium				10	10	100.0	9	90.0
Cadmium				10	11	110.0	9	90.0
Calcium								
Chromium				20	21	105.0	18	90.0
Cobalt				100	101	101.0	99	99.0
Copper				50	50	100.0	48	96.0
Iron								
Lead	10	11	110.0	* 60	62	103.3	57	95.0
Magnesium								
Manganese				30	29	96.7	27	90.0
Mercury	0.4	0.4	100.0					
Nickel				80	88	110.0	71	88.8
Potassium								
Selenium	10	11	110.0	* 120	116	96.7	124	103.3
Silver				20	22	110.0	14	70.0
Sodium								
Thallium	20			* 60	48	80.0	56	93.3
Vanadium				100	96	96.0	91	91.0
Zinc				40	44	110.0	44	100.0

*Two times the CRDL is below the instrument detection limit.
Starred elements are at two times the IDL.

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3
BLANKS

00010

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MLU-011189

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	P PBW C1014 F PBW ____ Preparation Blank	C	M
Aluminum	40	U	40	U	40	U	40	U	49	B	P
Antimony	30	U	30	U	30	U	30	U	30	U	P
Arsenic	30	U	30	U	30	U	30	U	30	U	P
Barium	2	U	2	U	2	U	2	U	3	B	P
Beryllium	1	U	1	U	1	U	1	U	1	U	P
Cadmium	5	U	5	U	5	U	5	U	5	U	P
Calcium	30	U	30	U	30	U	30	U	45	B	P
Chromium	10	U	10	U	10	U	10	U	10	U	P
Cobalt	20	U	20	U	20	U	20	U	20	U	P
Copper	10	U	10	U	10	U	10	U	10	U	P
Iron	10	U	10	U	10	U	10	U	51	B	P
Lead	30	U	30	U	30	U	30	U	30	U	P
Magnesium	30	U	30	U	30	U	30	U	49	B	P
Manganese	2	U	2	U	2	U	2	U	2	U	P
Mercury									NR		X
Nickel	20	U	20	U	20	U	20	U	20	U	P
Potassium	1000	U	1000	U	1000	U	1000	U	1000	U	P
Selenium	60	U	60	U	60	U	60	U	60	U	P
Silver	5	U	5	U	5	U	5	U	5	U	P
Sodium	200	U	200	U	200	U	200	U	200	U	P
Thallium	30	U	30	U	30	U	30	U	30	U	P
Vanadium	10	U	10	U	10	U	10	U	10	U	P
Zinc	5	U	5	U	5	U	5	U	7	B	P
Cyanide											

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3
BLANKS

00011

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: HW-01118

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum											
Antimony											
Arsenic	2	U	2	U	2	U			2	U	F
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead	2	U	2	U	2	U			2	U	F
Magnesium											
Manganese											
Mercury	0.2	U	0.2	U	0.2	U	0.2	U			CV
Nickel											
Potassium											
Selenium	2	U	2	U	2	U	2	U	2	U	F
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

U.S. EPA - CLP

3
BLANKS

00012

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLAMAN

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-01118

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Aluminum											
Antimony											
Arsenic											
Barium											
Beryllium											
Cadmium											
Calcium											
Chromium											
Cobalt											
Copper											
Iron											
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium											
Selenium			2	U	2	U	2	U			
Silver											
Sodium											
Thallium											
Vanadium											
Zinc											
Cyanide											

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4

ICP INTERFERENCE CHECK SAMPLE

00013

Lab Name: ITAS KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No: ITNA 44561 SAS No.: _____ SDG No.: [illegible]

ICP ID Number: JA1100 ICS Source: SPEX

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	500000	485000	468000	474000		484000	439000	
Antimony								
Arsenic								
Barium		471		463	98.3		426	90.4
Beryllium		520		487	93.6		446	85.8
Cadmium		990		819	82.7		803	81.1
Calcium	500000	509000	490000	526000		451000	460000	
Chromium		452		433	95.8		408	90.3
Cobalt		459		420	91.5		407	88.7
Copper		441		415	94.1		394	89.3
Iron	200000	188000	179000	189000		164000	173000	
Lead		1010		956	94.6		963	95.4
Magnesium	500000	495000	481000	481000		444000	444000	
Manganese		451		406	90.0		392	86.9
Mercury								
Nickel		863		831	96.3		781	90.5
Potassium								
Selenium								
Silver		909		866	95.3		840	92.4
Sodium								
Thallium								
Vanadium		467		450	96.4		437	93.6
Zinc		920		851	92.5		810	88.0

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

00014

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44561_____ SAS No.: _____ SDG No.: MW-011189 _

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

LCSW C1016

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	20000.0	18915.47	94.6						
Antimony	4000.0	3688.97	92.2						
Arsenic	4000.0	3609.86	90.2						
Barium	4000.0	3798.23	95.0						
Beryllium	4000.0	3858.12	96.5						
Cadmium	4000.0	3647.90	91.2						
Calcium	20000.0	20005.93	100.0						
Chromium	4000.0	3716.76	92.9						
Cobalt	4000.0	3645.82	91.1						
Copper	4000.0	3449.64	86.2						
Iron	20000.0	20491.35	102.5						
Lead	4000.0	3682.65	92.1						
Magnesium	20000.0	19179.00	95.9						
Manganese	4000.0	3353.58	83.8						
Mercury									
Nickel	4000.0	3578.48	89.5						
Potassium	20000.0	19619.97	98.1						
Selenium	4000.0	3566.66	89.2						
Silver	4000.0	2283.96	57.1						
Sodium	20000.0	19463.91	97.3						
Thallium	4000.0	3486.38	87.2						
Vanadium	4000.0	3478.39	87.0						
Zinc	4000.0	3682.49	92.1						
Boron									

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

00015

GFAA & CVAA ONLY

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN

Lab Code: IT-STU Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-01118

Solid LCS Source: SPEX

Aqueous LCS Source: SPEX

Analyte	LCSW 01017 Aqueous (ug/L) True	Found	%R	LCSS Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic	40	38	95.0	4.0			3.2	4.8	
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20	19	95.0	2.0			1.6	2.4	
Magnesium									
Manganese									
Mercury	NR			0.20			0.16	0.24	
Nickel									
Potassium									
Selenium	20	20	100.0	2.0			1.6	2.4	
Silver									
Sodium									
Thallium	40			4.0			3.2	4.8	
Vanadium									
Zinc									
Cyanide									

ACCEPTANCE LIMITS: 80.0 - 120.0 %R

NR = NOT REQUIRED

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

00016

EPA SAMPLE NO.

MW-081189

Lab Name: _____ Contract: COE HOLLOMAN AFB

Lab Code: IT STL Case No.: ITNA 44561 SAS No.: _____ SDG No.: MW-011189

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium	21	B					
Beryllium							
Cadmium	5	U					
Calcium							
Chromium	10	U					
Cobalt							
Copper							
Iron	144						
Lead							
Magnesium							
Manganese	519						
Mercury							
Nickel							
Potassium							
Selenium							
Silver	5	U					
Sodium	1580000		1720000		8.9		P
Thallium							
Vanadium							
Zinc							

U.S. EPA - CLP

10
HOLDING TIMES

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 445601 SAS No.: _____ SDG No.: MW-0111.

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
MW-011189	WATER	11-09-89	11-15-89	6 DAYS		
MW-021189	WATER	11-09-89	11-15-89	6 DAYS		

U.S. EPA - CLP

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

00018

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44561_____ SAS No.: _____ SDG No.: MW-011139_

ICP ID Number: JA1100_____ Date: 10/01/09

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

FORM XI - IN

U.S. EPA - CLP

00019

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44561_____ SAS No.: _____ SDG No.: MW-011139_

ICP ID Number: _____ Date: 10/01/09

Flame AA ID Number : _____

Furnace AA ID Number : 5100/600____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.0	F
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

00020

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44561_____ SAS No.: _____ SDG No.: MW-011189_

ICP ID Number: _____ Date: 10/01/09

Flame AA ID Number : _____

Furnace AA ID Number : 12E/188_____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	196.00		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	217.00		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

00021

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44561_____ SAS No.: _____ SDG No.: MW-011139_

ICP ID Number: _____ Date: 10/01/09

Flame AA ID Number : 151_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00022

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44561 _____ SAS No.: _____ SDG No.: MW-011139_

ICP ID Number: JA1100_____ Date: 10/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : Al	Ca	Fe	Mg	AS
Aluminum	308.20					
Antimony	206.80					
Arsenic	193.60	0.0103600		0.0013600		
Barium	493.40					
Beryllium	313.00					
Cadmium	228.80					
Calcium	317.90					0.0055600
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30	0.0006800				
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0103900		
Vanadium	292.40					
Zinc	213.80					

Comments:

FORM XII (PART 1) - IN

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00023

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44561_____ SAS No.: _____ SDG No.: MW-011189_

ICP ID Number: JA1100_____ Date: 10/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : BA	BE	CO	CR	NI
Aluminum	308.20					
Antimony	206.80				0.0055800	
Arsenic	193.60	0.0006600		0.0005200		
Barium	493.40					
Beryllium	313.00				0.0002800	0.0001200
Cadmium	228.80		0.0025800			
Calcium	317.90					
Chromium	267.70					
Cobalt	228.60					
Copper	324.70					
Iron	259.90					
Lead	220.30					
Magnesium	279.00					
Manganese	257.60					
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60					
Potassium	766.00					
Selenium	196.00					
Silver	328.00					
Sodium	588.90					
Thallium	190.80			0.0018300		
Vanadium	292.40					
Zinc	213.80					0.0032600

Comments:

FORM XII (PART 2) - IN

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00024

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44561_____ SAS No.: _____ SDG No.: MW-011139_

ICP ID Number: JA1100_____ Date: 10/01/09

Analyte	Wave-length (nm)	Interelement Correction Factors for : V_	__	__	__	__
Aluminum	308.20	0.0218400	-999999.00	-999999.00	-999999.00	-999999.00
Antimony	206.80		-999999.00	-999999.00	-999999.00	-999999.00
Arsenic	193.60	0.0128200	-999999.00	-999999.00	-999999.00	-999999.00
Barium	493.40		-999999.00	-999999.00	-999999.00	-999999.00
Beryllium	313.00	0.0062300	-999999.00	-999999.00	-999999.00	-999999.00
Cadmium	228.80		-999999.00	-999999.00	-999999.00	-999999.00
Calcium	317.90		-999999.00	-999999.00	-999999.00	-999999.00
Chromium	267.70		-999999.00	-999999.00	-999999.00	-999999.00
Cobalt	228.60		-999999.00	-999999.00	-999999.00	-999999.00
Copper	324.70		-999999.00	-999999.00	-999999.00	-999999.00
Iron	259.90		-999999.00	-999999.00	-999999.00	-999999.00
Lead	220.30		-999999.00	-999999.00	-999999.00	-999999.00
Magnesium	279.00		-999999.00	-999999.00	-999999.00	-999999.00
Manganese	257.60		-999999.00	-999999.00	-999999.00	-999999.00
Mercury		-999999.00	-999999.00	-999999.00	-999999.00	-999999.00
Nickel	231.60		-999999.00	-999999.00	-999999.00	-999999.00
Potassium	766.00		-999999.00	-999999.00	-999999.00	-999999.00
Selenium	196.00		-999999.00	-999999.00	-999999.00	-999999.00
Silver	328.00		-999999.00	-999999.00	-999999.00	-999999.00
Sodium	588.90		-999999.00	-999999.00	-999999.00	-999999.00
Thallium	190.80	0.0019670	-999999.00	-999999.00	-999999.00	-999999.00
Vanadium	292.40		-999999.00	-999999.00	-999999.00	-999999.00
Zinc	213.80		-999999.00	-999999.00	-999999.00	0.0000000

Comments:

FORM XII (PART 2) - IN

U.S. EPA - CLP

13

ICP LINEAR RANGES (QUARTERLY)

00025

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: 44561_____ SAS No.: _____ SDG No.: MW-011189_

ICP ID Number: JA1100_____ Date: 10/01/89

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	
Antimony	6.00	15000.0	
Arsenic	6.00	15000.0	
Barium	6.00	15000.0	
Beryllium	6.00	15000.0	
Cadmium	6.00	15000.0	
Calcium	6.00	500000.0	
Chromium	6.00	15000.0	
Cobalt	6.00	15000.0	
Copper	6.00	40000.0	
Iron	6.00	500000.0	
Lead	6.00	40000.0	
Magnesium	6.00	500000.0	
Manganese	6.00	40000.0	
Mercury			NR
Nickel	6.00	15000.0	
Potassium	6.00	500000.0	
Selenium	6.00	15000.0	
Silver	6.00	15000.0	
Sodium	6.00	900000.0	
Thallium	6.00	15000.0	
Vanadium	6.00	12000.0	
Zinc	6.00	40000.0	

Comments:

&&xxfcxExEx[redacted]HpFxxExExExE

FORM XIII - IN

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED

DEC 26 1989

IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

IT Corporation

Date: December 18, 1989

Albuquerque

Attn: Mr. Mark Lyons

Job Number PN 3003-359

This is the Certificate of Analysis for the following samples:

Client Project ID:	ITNA 44635 Project
Date Received by Lab:	November 20, 1989
Work Order:	T9-11-195
Number of Samples:	11
Sample Type:	Water

I. Introduction

Eleven water samples were received on November 20, 1989. They were sent from the Knoxville laboratory at the request of your office. The samples were collected at Holloman AFB. They are identified as follows:

MW-041189	MW-071189
MW-061189	MW-121189
S-041189	S-021189
MW-021189	MW-011189
MW-031189	MW-081189
MW-051189	

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information, the analytical results, and the appropriate method detection limits. Please note that all data are blank corrected, or if any compound is found in the corresponding lab blank it is subtracted from the analytical result before it is reported. The samples were analyzed for arsenic and selenium using EPA Methods 206.3 and 270.3, respectively.

Reviewed and Approved:

Ken Mueller
Inorganic Lab Group Supervisor
T911195

RECEIVED

DEC 26 1989

IT CORP.-ALBUQUERQUE

Client: ITNA 44635 Project
Work Order: T9-11-195
T911195A

IT ANALYTICAL SERVICES
CINCINNATI, OH

Sample ID	Lab No.	Arsenic ug/L	Selenium ug/L
MW-041189	-01	2.3	ND
MW-061189	-02	1.4	3.5
S-041189	-03	1.9	7.4
MW-021189	-04	3.3	ND
MW-031189	-05	1.1	ND
MW-051189	-06	5.2	ND
MW-071189	-07	4.4	ND
MW-121189	-08	7.0	ND
S-021189	-09	6.4	ND
MW-011189	-10	4.3	2.2
MW-081189	-11	0.6	ND
Detection Limit		0.3	0.3

MATRIX SPIKE RECOVERIES

MW-041189	-03	63.0%	68.7%

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RADIAN
CORPORATION

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088
(512)454-4797

3 January 1990

Rec'd
DW
1/8/90

Mr. Dann Meyer
IT Corporation
5301 Central Avenue NE
Suite 700
Albuquerque, NM 87108

Dear Mr. Meyer:

Enclosed please find our report containing the POX analyses for the Holloman AFB samples submitted to Radian on 16 November 1989. I understand you have been informed that these analyses were performed outside of the analytical hold time as our instrument had to be sent off for repair to the manufacturer, as stated in the comments section of Appendix A to the report. This comments section also points out that the samples had to be neutralized with sodium hydroxide before analyses could be performed. The samples had been preserved with sulfuric acid, contrary to the method specifications.

If you have any questions concerning these data, please feel free to call me at (512) 454-4797.

Sincerely,

Karen L. Achord

Karen L. Achord
Client Services Coordinator

cc: Rob Richardson

Enclosure

RECEIVED
JAN 8 1990
IT CORP.-ALBUQUERQUE

RADIAN CORPORATION

Radian Work Order 89-11-151

Analytical Report
12/29/89

IT Corp

IT Corporation
5301 Central Ave NE,Suite 700
Albequerque, NM 87108

Dann Meyer

Customer Work Identification Holloman AFB
Purchase Order Number

Contents:

1 Analytical Data Summary
2 Sample History
3 Comments Summary
4 Notes and Definitions

Radian Analytical Services
8501 Mo-Pac Boulevard
P. O. Box 201088
Austin, TX 78720-1088

512/454-4797

Client Services Coordinator: JSGIBSON

Certified by:

Previously Reported on 12/22/89.

RADIAN CORPORATION

Analytical Data Summary

IT Corp
Radian Work Order: 89-11-151

Method/Analyte	Sample Identifications				
	MW-011189	MW-021189	MW-031189	MW-041189	MW-051189
	01	02	03	04	05
Matrix	water	water	water	water	water
Purgeable organic halides					
Purgeable organic halides	0.14 mg/L	<0.024 mg/L	<0.024 mg/L	<0.024 mg/L	<0.024 mg/L
Purgeable organic halides					
Purgeable organic halides	0.13 mg/L				
Purgeable organic halides					
Purgeable organic halides	0.12 mg/L				
Purgeable organic halides					
Purgeable organic halides	0.13 mg/L				

For a detailed description of flags and technical terms in this report refer to the glossary.

RADIAN CORPORATION

Analytical Data Summary

IT Corp
Radian Work Order: 89-11-151

Method/Analyte	Sample Identifications				
	MW-061189	MW-071189	MW-081189	MW-111189	MW-121189
	06	07	08	09	10
Matrix	water	water	water	water	water
Purgeable organic halides					
Purgeable organic halides	0.22 mg/L	<0.024 mg/L	<0.024 mg/L	<0.024 mg/L	<0.024 mg/L

For a detailed description of flags and technical terms in this report refer to the glossary.

RADIAN CORPORATION

Analytical Data Summary

IT Corp
Radian Work Order: 89-11-151

Method/Analyte	Sample Identifications				
	MW-121189 dup	MW-121189 MS	MW-121189 MSD	S-021189	S-041189
	11	12	13	14	15
Matrix	water	water	water	water	water
Purgeable organic halides					
Purgeable organic halides	<0.024 mg/L	82 %recvry	86 %recvry	<0.024 mg/L	0.13 mg/L
Purgeable organic halides					
Purgeable organic halides				<0.024 mg/L	
Purgeable organic halides					
Purgeable organic halides				<0.024 mg/L	
Purgeable organic halides					
Purgeable organic halides				<0.024 mg/L	

For a detailed description of flags and technical terms in this report refer to the glossary.

RADIAN CORPORATION

Analytical Data Summary

IT Corp
Radian Work Order: 89-11-151

Method/Analyte	Sample Identifications			
	S-041189 dup	S-041189 MS	S-041189 MSD	Method Blank
	16	17	18	19
Matrix	water	water	water	water
Purgeable organic halides				
Purgeable organic halides	0.13 mg/L	84 %recvry	84 %recvry	<0.024 mg/L

For a detailed description of flags and technical terms in this report refer to the glossary.

RADIAN CORPORATION

Sample History

IT Corp
Radian Work Order: 89-11-151

Sample Identifications and Dates

Sample ID	MW-011189	MW-021189	MW-031189	MW-041189	MW-051189	MW-061189
Date Sampled	11/08/89	11/07/89	11/07/89	11/06/89	11/07/89	11/06/89
Date Received	11/16/89	11/16/89	11/16/89	11/16/89	11/16/89	11/16/89
Matrix	water	water	water	water	water	water
	01	02	03	04	05	06
Purgeable organic halides						
Prepared	12/15/89	12/16/89	12/16/89	12/16/89	12/16/89	12/16/89
Analyzed	12/15/89	12/16/89	12/16/89	12/16/89	12/16/89	12/16/89
Analyst	MH	MJS	MJS	MJS	MJS	MJS
File ID						
Blank ID						
Instrument	DX 20	DX 20	DX 20	DX 20	DX 20	DX 20
Report as	received	received	received	received	received	received
Purgeable organic halides						
Prepared	12/15/89					
Analyzed	12/15/89					
Analyst	MH					
File ID						
Blank ID						
Instrument	DX 20					
Report as	received					
Purgeable organic halides						
Prepared	12/15/89					
Analyzed	12/15/89					
Analyst	MH					
File ID						
Blank ID						
Instrument	DX 20					
Report as	received					
Purgeable organic halides						
Prepared	12/15/89					
Analyzed	12/15/89					
Analyst	MH					
File ID						
Blank ID						
Instrument	DX 20					
Report as	received					

RADIAN CORPORATION

Sample History

IT Corp
Radian Work Order: 89-11-151

Sample Identifications and Dates

Sample ID	MW-071189	MW-081189	MW-111189	MW-121189	MW-121189 dup	MW-121189 MS
Date Sampled	11/07/89	11/08/89	11/05/89	11/07/89	11/07/89	11/07/89
Date Received	11/16/89	11/16/89	11/16/89	11/16/89	11/16/89	11/16/89
Matrix	water	water	water	water	water	water
	07	08	09	10	11	12
Purgeable organic halides						
Prepared	12/16/89	12/16/89	12/16/89	12/16/89	12/16/89	12/16/89
Analyzed	12/16/89	12/16/89	12/16/89	12/16/89	12/16/89	12/16/89
Analyst	MJS	MJS	MJS	MJS	MJS	MJS
File ID						
Blank ID						
Instrument	DX 20	DX 20	DX 20	DX 20	DX 20	DX 20
Report as	received	received	received	received	received	received

IT Corp
Radian Work Order: 89-11-151

Sample Identifications and Dates

Sample ID	MW-121189 MSD	S-021189	S-041189	S-041189 dup	S-041189 MS	S-041189 MSD
Date Sampled	11/07/89	11/07/89	11/06/89	11/06/89	11/06/89	11/06/89
Date Received	11/16/89	11/16/89	11/16/89	11/16/89	11/16/89	11/16/89
Matrix	water	water	water	water	water	water
	13	14	15	16	17	18
Purgeable organic halides						
Prepared	12/16/89	12/17/89	12/17/89	12/17/89	12/17/89	12/17/89
Analyzed	12/16/89	12/17/89	12/17/89	12/17/89	12/17/89	12/17/89
Analyst	MJS	MJS	MJS	MJS	MJS	MJS
File ID						
Blank ID						
Instrument	DX 20	DX 20	DX 20	DX 20	DX 20	DX 20
Report as	received	received	received	received	received	received
Purgeable organic halides						
Prepared		12/17/89				
Analyzed		12/17/89				
Analyst		MJS				
File ID						
Blank ID						
Instrument		DX 20				
Report as		received				
Purgeable organic halides						
Prepared		12/17/89				
Analyzed		12/17/89				
Analyst		MJS				
File ID						
Blank ID						
Instrument		DX 20				
Report as		received				
Purgeable organic halides						
Prepared		12/17/89				
Analyzed		12/17/89				
Analyst		MJS				
File ID						
Blank ID						
Instrument		DX 20				
Report as		received				

RADIAN CORPORATION

Sample History

IT Corp
Radian Work Order: 89-11-151

Sample Identifications and Dates

Sample ID	Method Blank
Date Sampled	
Date Received	11/16/89
Matrix	water
	19

Purgeable organic halides						
Prepared	12/17/89					
Analyzed	12/17/89					
Analyst	MJS					
File ID						
Blank ID						
Instrument	DX 20					
Report as	received					

RADIAN CORPORATION

Appendix A

Comments, Notes and Definitions

RADIAN CORPORATION

The samples were analyzed outside of the hold time due to instrument failure. The samples had been preserved with sulfuric acid. This is contrary to the instructions in Method 9021. The acid in the samples had to be neutralized with sodium hydroxide before the analysis could be successfully completed.

RADIAN CORPORATION

IT Corp
Radian Work Order: 89-11-151

A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.

B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.

C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.

D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed,one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

E The reported value is estimated because of the presence of interference. The potential source of the interference is included in the report narrative.

G This flag identifies a GC/MS result whose concentration exceeds the calibration range for that specific analysis. Usually if one or more compounds have a response greater than full scale, the sample or extract is diluted and re-analyzed.

I This is a general purpose flag for those situations not covered by the standard flags. The specific definition of this flag is described in the Comments Summary or supplemental case narrative with the report.

J Indicates an estimated value for GC/MS data. This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.

NA This analyte was not analyzed.

NC Applies to RPD and spike recovery results. The relative percent difference (RPD) and spike recovery are not calculated when a result value is less than five times the detection limit or obvious matrix interferences are present. See * definition for further explanation of the unreliability of data near the detection limit. A spike recovery is not calculated when the sample result is greater than four times the spike added concentration because the spike added concentration is considered insignificant.

IT Corp
Radian Work Order: 89-11-151

ND This flag (or <) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added (spiked) to the sample for this analysis.

N\A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program as a specific sample source; for example, a quarterly well monitoring program.

Q This quality control standard is outside method or laboratory specified control limits. This flag is applied to matrix spike, analytical QC spike, and surrogate recoveries; and to RPD(relative percent difference) values for duplicate analyses and matrix spike/matrix spike duplicate result.

R This flag indicates that the analyte was detected in the reagent blank and the sample results are corrected for the amount in the blank.

S This flag indicates that a specific result from a metals analysis has been obtained using the Method of Standard Addition.

U Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The U flag indicates that second column was not requested.

X Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The X flag indicates a second column confirmation was performed but the analyte was not confirmed and is likely a false positive.

* The asterisk(*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

IT Corp
Radian Work Order: 89-11-151

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion);liquids/water
	ug/Kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million);liquids/water
	mg/Kg	milligrams per kilogram (parts per million);soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN ANALYTICAL SERVICES
QUALITY CONTROL SUMMARY
Form II

Client ID: IT CORP
Workorder: 8911151

Compiled: 12/20/89
By: BLR
Submitted:

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Units:mg/L

Parameter	Run Date	Initial Calibration True	Initial Calibration Found	Initial Calibration %R	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R	Continuing Calibration Found	Continuing Calibration %R
POX (spl 01)	12/15/89	3.963	3.473	87.6	3.963	3.427	86.5		
POX (spls 02-13)	12/16/89	3.963	3.333	84.1	3.963	3.223	81.3		
POX (spls 15-19)	12/17/89	3.963	3.318	83.7	3.963	3.587	90.5		

Comments CONTROL LIMITS 80-120%

RADIAN ANALYTICAL SERVICES
QUALITY CONTROL SUMMARY
Form V-1

Client ID: IT CORP
Workorder: 8911151
Matrix:WATER

Spiking Method: ANALYTICAL

SPIKE SAMPLE RECOVERY

Compiled: 12/20/89
By: BLR
Submitted:
Units:mg/L

Parameter	Sample Number	Sample Results Spike(SSR)	Sample(SR)	Spike Added(SA)	Dilution Factor	Control Limit	(1) %R	(2) Flag
POX	BLANK	3.467	--	3.963		80-120	87.5	

(*): Indicates value is < 5 x instrument detection limit.
(1): %R Percent recovery 100 * [(SSR - SR)/SA]
(Q): Matrix spike recovery was not within control limit which may indicate matrix interferences.
(NS): Sample result > 4 * Spike Added concentration therefore the %R should not be considered.

Comments:

RADIAN ANALYTICAL SERVICES
QUALITY CONTROL SUMMARY
Form V-2

Client ID: IT CORP
Workorder: 8911151

CONTROL LIMITS
%R: 75% - 125%
RPD: 20% Relative Percent Difference of MS/MSD %R

Compiled: 12/20/89
By: BLR
Submitted:

Matrix:WATER

MATRIX SPIKE (MS/MSD) MATRIX SPIKE DUPLICATE

Units:mg/L

Parameter	Fraction	Sample Result	Conc. MS(SA)	Conc. MS	MS %R	Conc. MSD(SA)	Conc. MSD	MSD %R	RPD
POX	10	<0.024	3.963	3.263	82.3	3.963	3.408	86.0	4.4
	15	0.1345	3.963	3.450	83.7	3.963	3.445	83.5	0.2

%R: ((Conc MS - SR) / SA) * 100 RPD: 100 * | (MS %R - MSD %R)/(MS %R + MSD %R) |/2

SA: Spike Added (Q): %R or RPD outside control limits.

(*): Value less than 5 x I.D.L. (NS): Spike added less than 4 x SR, considered insignificant.

Comments: spls 12 & 13 are ms/msd of spl 10
spls 17 & 18 are ms/msd of spl 15

RADIAN ANALYTICAL SERVICES
QUALITY CONTROL SUMMARY
Form VI

Client ID: IT CORP
Workorder: 8911151
Matrix:WATER

Duplicate Type: ANALYTICAL

DUPLICATES

Compiled: 12/20/89
By: BLR
Submitted:
Units:mg/L

Parameter	Sample Number	Control Limit	Sample	Duplicate	(1) RPD	(2) Flag
POX	10	<=20	<0.024	<0.024		NC
	15	<=20	0.132	0.137	3.7	

(*): Indicates value is < 5 x instrument detection limit.
(Q): RPD outside control limit.
(1): RPD: 100 * | (S - D)/(S + D) |/2
(2): "NC" Not calculable due to a value < 5 x IDL.

Comments: spl 11 is the duplicate of spl 10
spl 16 is the duplicate of spl 15

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NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: Holloman	County name: Otero	Date received: 11-6-89	Time received: 2:11
Date collected: 11-6-89	Time collected: 10:30	Collected by:	Lab No. 9336
Collection point: S-4	Disinfecting System ☐ Yes ☐ No		
System owner:	RESIDUAL: mg/L		

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☑ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☑ Routine ☑ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - ***specify:***
☑ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP.-ALBUQUERQUE

Ned Rae 11/14/89

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		/100 ml
Total (mf)		<100 /100 ml
Fecal (mpn)		/100 ml
Fecal (mf)		< 100 /100 ml

Negative Control | Noncoliforms 100 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

100x

Analyst: Sharon Smith | Date reported: 11-7-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: Holloman	County name: Otero	Date received: 11-6-89	Time received: 2:11
Date collected	Time collected: 10:45	Collected by:	Lab. No. 9334
Collection point: MW-6	Disinfecting System ☐ Yes ☐ No		
System owner:	RESIDUAL: mg/L		

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☑ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☑ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - ***specify:***
☑ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP.-ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		/100 ml
Total (mf)		< 1 /100 ml
Fecal (mpn)		/100 ml
Fecal (mf)		< 1 /100 ml

Negative Control | Noncoliforms 11 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

no dilution

Analyst: Sharon Smith | Date reported: 11-7-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: Hollomcan	County name: Otero	Date received: 11-6-89	Time received: 3 11
Date collected: 11-6-89	Time collected: 1245	Collected by	Lab No. 1385
Collection point: MW 4	Disinfecting System ☐ Yes ☐ No		
System owner	RESIDUAL: mg/L		

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☑ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☑ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*

☐ Potability - Coliform Group ☐ Other - ***specify:***
☑ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP. - ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	< 1	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	< 1	/100 ml

Negative Control nzj Noncoliforms 53 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

No dilution

Analyst: Sharon Smith Date reported: 11-7-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

MICROBIOLOGICAL WATER REPORT

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: County name: Otero
Date collected: Time collected: 10:30 Collected by:
Collection point: MW-03 Disinfecting System: ☐ Yes ☐ No
System owner: Holloman RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☑ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special
☑ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☑ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP.-ALBUQUERQUE

Date received: 11 7 89 Time received: 3:55
Lab. No. 9424

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS	POSITIVE TUBES (confirmed)
Total (mpn)	
Total (mpn)	/100 ml
Total (mf)	<100 /100 ml
Fecal (mpn)	/100 ml
Fecal (mf)	<100 /100 ml

Negative Control: Noncoliforms 1300 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

100X

Analyst: Sharon Smith Date reported: 11-8-89

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Soil, Water, & Plant Testing Lab.
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BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

MICROBIOLOGICAL WATER REPORT

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: County name: Otero
Date collected: Time collected: 10:30 Collected by:
Collection point: MW-02 Disinfecting System: ☐ Yes ☐ No
System owner: RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☑ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special
☑ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - *specify:*
☑ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP.-ALBUQUERQUE

Date received: 11.7.89 Time received: 3:55
Lab. No. 9425

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS	POSITIVE TUBES (confirmed)
Total (mpn)	
Total (mpn)	/100 ml
Total (mf)	<100 /100 ml
Fecal (mpn)	/100 ml
Fecal (mf)	<100 /100 ml

Negative Control: Noncoliforms 2600 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

100X

Analyst: Sharon Smith Date reported: 11-8-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS. OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	Date received 11-7-89 / Time received 3:55
Date collected	Time collected 1215	Collected by	Lab. No. 9426
Collection point MW-05		Disinfecting System ☐ Yes ☐ No	
System owner		RESIDUAL mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - ***specify:***
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP.-ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<10	/100 ml

Negative Control — Noncoliforms 310 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

10x

Analyst Sharon Smith — Date reported 11-8-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS. OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	Date received 11-7-89 / Time received 3:55
Date collected	Time collected 1300	Collected by	Lab. No. 9427
Collection point MW-07		Disinfecting System ☐ Yes ☐ No	
System owner		RESIDUAL mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - ***specify:***
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP.-ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		/100 ml
Total (mf)	<100	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<100	/100 ml

Negative Control — Noncoliforms 1200 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

100x

Analyst Sharon Smith — Date reported 11-8-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name
County name: Otero
Date collected
Time collected: 1400
Collected by
Collection point: S-2
Disinfecting System ☐ Yes ☐ No
System owner
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No.
☐ Routine ☐ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - ***specify:***
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP. - ALBUQUERQUE

Date received: 11-7-89
Time received: 3:55
Lab. No. 9429

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
	Total (mpn)	POSITIVE TUBES (confirmed)
	Total (mpn)	/100 ml
	Total (mf)	<[illegible] /100 ml
	Fecal (mpn)	/100 ml
	Fecal (mf)	<[illegible] /100 ml

Negative Control
Noncoliforms 5100/100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

100x

Analyst: Sharon Smith
Date reported: 11-8-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name
County name: Otero
Date collected
Time collected: 1500
Collected by
Collection point: MW-12
Disinfecting System ☐ Yes ☐ No
System owner
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No.
☐ Routine ☐ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - ***specify:***
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP. - ALBUQUERQUE

Date received: 11-7-89
Time received: 3:55
Lab. No. 9428

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
	Total (mpn)	POSITIVE TUBES (confirmed)
	Total (mpn)	/100 ml
	Total (mf)	<[illegible] /100 ml
	Fecal (mpn)	/100 ml
	Fecal (mf)	<[illegible] /100 ml

Negative Control
Noncoliforms 7000/100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

100x

Analyst: Sharon Smith
Date reported: 11-8-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	Date received 11-8-89 / Time received 1 45
Date collected	Time collected 0900	Collected by	Lab. No. 9449
Collection point MW-8		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - ***specify:***
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP.-ALBUQUERQUE

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<10	/100 ml

Negative Control | Noncoliforms 950 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

10X

Analyst Sharon Smith | Date reported 11-9-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	Date received 11-8-89 / Time received 1 45
Date collected	Time collected 1030	Collected by	Lab. No. 9448
Collection point MW-1		Disinfecting System ☐ Yes ☐ No	RESULTS of TESTS for COLIFORM GROUP
System owner		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☐ Other - ***specify:***
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
NOV 14 1989
IT CORP.-ALBUQUERQUE

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<10	/100 ml

Negative Control | Noncoliforms <10 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

10X

Analyst Sharon Smith | Date reported 11-9-89

APPENDIX E

CONFIRMATION NOTICE

Project No. 301251.02.03
17 November, 1989

From: D. Meyer
IT Corporation
Albuquerque, NM
505-262-8800

To: B. Stewart
U. S. Army Corps of Engineers
Omaha District
Omaha, NE
402-221-7807 (fax)

Confirmation Notice

Subject: POX Analyses

Upon receipt of our POX analyses from the September (second) round of sampling, Mark Lyon, of my staff, questions IT Austin Analytical Laboratory regarding their methods. On Wednesday, 15 November, we discovered they do not use SW-846 Method 9021. They did not inform me of this at any time earlier.

The November (third) round of samples had been delivered to Austin. We asked them to hold them and keep them refrigerated. The samples have a 14-day holding time. The oldest samples were 8 days old.

We found Radian Corporation, in Austin, was capable of performing the POX analyses as soon as the samples were available. This allowed us to make holding times.

IT subcontracted Radian to perform the analyses on the third round of samples. They will use Method 9021.

IT Analytical Services in Cincinnati are capable of Method 9021, and we will use them in the future. The Sampling Plan will be modified to indicate this change. Data reports for the second, third, and fourth rounds will indicate which laboratories and which methods were, in fact, used.

Project No. 301251.02
17 November, 1989

From: D. Meyer
IT Corporation
Albuquerque, NM
505-262-8800

To: B. Stewart
U. S. Army Corps of Engineers
Omaha District
Omaha, NE
402-221-7807 (fax)

Confirmation Notice

Subject: Metals Analyses

After reviewing the September (second) round data from Holloman ground water samples, Mark Lyon, of my staff, noticed Selenium and Arsenic detection limits were not as good as the sampling plan required (5 microgram/l and 10 microgram/l, respectively). The detection limits for Arsenic were, however, lower than the MCL (50 microgram/l), but the detection limits for Selenium were two to nearly four times the MCL of 10 microgram/l. The high sulfate concentration in the brine is interfering with the methods currently used, and presumably, would continue to do so.

I propose we perform Arsenic and Selenium on the November (third) round samples using EPA methods 206.3 (As) and 270.3 (Se), by hydride generation, for which detection limits in brine should be 1-5 ppb. We will perform the As and Se analyses on the samples by the existing methods, as well, for comparison purposes.

IT Cincinnati Analytical Services is capable of these alternate methods, including digestion (EPA Method 206.5). A split of the samples currently stored in the Knoxville laboratory can be provided to Cincinnati. Holding times are not critical. Standard chain-of-custody will be followed. After receiving results, we can choose the most reasonable alternative.

All data reports will indicate the methods used and why changes were made.

I will be out of the office after noon today and next week. If there is any problem with this approach, please call Mark Lyon at 505-262-8800 immediately. He is very knowledgeable about the project.

Project No. 301251.02.03
22 December, 1989

From: D. Meyer
IT Corporation
Albuquerque, NM
505-262-8800

To: B. Stewart
U. S. Army Corps of Engineers
Omaha District
Omaha, NE
402-221-7807 (fax)

Confirmation Notice, HAFB Ground Water Monitoring

Subject: Arsenic and Selenium Analyses

In the confirmation notice dated 17 November, 1989, I indicated IT would try an alternate method for arsenic and selenium analyses because the methods listed in the A-E Quality Control Plan and Sampling Plan (QCP/SP) were unable to meet the detection limits listed in the plan because of the high TDS of the Holloman ground waters. Splits from the November round were provided (with full chain of custody) to our PEI subsidiary laboratory in Cincinnati, OH to perform As and Se analyses by hydride generation using EPA methods 206.5 (digestion) 206.3 (As) and 270.3 (Se). ITAS-Knoxville analyzed for As and Se using the EPA-CLP methods (comparable to the SW-846 methods) as originally proposed in the plan. Table 1 shows a comparison of the results.

The EPA-CLP procedures occasionally achieved the detection limit requirement for arsenic, and only once for selenium. The EPA 200 methods consistently achieved the detection limits. I have instructed that the December samples will be analyzed by the EPA 200 methods for As and Se by PEI. If this is not acceptable to you, please notify me as soon as possible. This change will not affect future quarterly or semi-annual sampling, because As and Se are not included among the analytical parameters.

TABLE 1

COMPARISON OF ANALYTICAL METHODS RESULTS FOR ARSENIC AND SELENIUM THIRD MONTHLY SAMPLING, HOLLOMAN AIR FORCE BASE, NEW MEXICO NOVEMBER, 1989

	ARSENIC (μ g/l) Required detection limit = 10 μg/l[1]		SELENIUM (μ g/l) Required detection limit = 5 μg/l[1]	
MONITOR WELL	EPA-CLP SOW (7/89)	EPA 206.5-206.3	EPA-CLP SOW (7/89)	EPA 206.5-270.3
MW-4	9-U	2.3	20-U	0.3-U
MW-6	12-U	1.4	60-U	3.5
S-4	3-U	1.9	60-U	7.4
MW-2	30-U[2]	3.3	40-U	0.3-U
MW-3	30-U[2]	1.1	40-U	0.3-U
MW-5	30-U[2]	5.2	50-U	0.3-U
MW-7	30-U[2]	4.4	50-U	0.3-U
MW-12	30-U[2]	7.0	30-U	0.3-U
S-2	30-U[2]	6.4	30-U	0.3-U
MW-1	13-U	4.3	60-U	2.2
MW-8	5-U	0.6	5-U	0.3-U

U - Metal was analyzed for but not detected. Value is the detection limit for the sample.
[1] A-E QCP/SP
[2] Laboratory reported values from analysis by inductively coupled plasma emission (ICP), which yielded lower detection limits than analysis by graphite furnace atomic absorption (GFAA).

INTERNATIONAL TECHNOLOGY CORPORATION

DATE 11/21/89 TIME 1625

PROJECT NO. 301251.02

NAME HOLLOMAN AFB

RECORD OF TELEPHONE CALL

TELEPHONE NO. 512-454-4797

TO Jim Dawson OF IT Corp, ABQ, NM

FROM Steve Milton OF RADIAN CORP, AUSTIN, TX

SUBJECT DISCUSSED

Ground Water Samples collected 11/6, 7 & 8/89 for POX Analysis

- Holding times for the samples are expiring on 11/20, 21 & 22/89. What do we want to do with the samples? Equipment breakdown at ITAS Austin & Radian lab prevented analysis of samples within holding time. GWD & Mark Lynn discussed the situation. Decided to have them hold the samples and analyze for POX during the week of 11/27/89.

Jim Dawson called back to advise Radian of our decision.

ACTION TO BE TAKEN

WHITE: ORIGINATOR YELLOW: FILE 19A-7-85

APPENDIX F

A-E DAILY QUALITY CONTROL REPORTS

Project No. 301251.02.0
COE

Date: 11/05/89
Sheet No.: 008

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 3rd Round - monthly RCRA gw sampling + analysis at wastewater treatment lagoons.

Weather: Clear, Sunny, high of ~70°F.

Work Performed: At 10 RCRA monitoring wells: (1) Monitor background and wellbore headspace using HNu photo-ionization detector; (2) measure depth to fluids and total well depth (no immissible phases detected in any of the wells).

Sampling Performed: NA

Problems and Corrective Actions: 2 locks were cut off (MW-4 and MW-6); replacement locks to be provided by Sharon Moore, HAFB. It is anticipated that the majority of the locks will require replacement during the course of monitoring due to rusting of the shanks. Oiling of these locks is not recommended due to the chance of contaminating the environmental monitoring wells.

Quality Control Activities Initiated: The interface probe and the HNu Photo ionization detector were calibrated before and after use.

Signature: Ann M. Houska, IT Corp. - Albuquerque.

Project No 301251.02.0
COE

Date: 11/06/89
Sheet No.: 009

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 3rd Round - monthly. RCRA gw sampling + analysis at wastewater treatment lagoons.

Weather: Clear + sunny. Low of ~45°F. High ~ 70°F.

Work Performed: Calibrated equipment, purged and sampled 3 monitor wells, packed samples, delivered samples to New Mexico State Univ. for coliform bacteria analysis (within 6 hr holding time), met Federal Express courier with other shipment coolers.

Sampling Performed: monitor wells MW-4, MW-6 and S-4.

Problems and Corrective Actions: Clear glass sample containers are being used for phenolic samples instead of amber glass as stated in the Sampling + Analysis plan. This variance was approved of by the analytical laboratory.

Quality Control Activities Initiated: Field equipment calibrated daily before and after field use. A trip blank (poured in IT-ABQ) was sent along with POX samples to IT Analytical Services in Austin, Texas. All samples maintained under full chain of custody procedures.

Signature: Ann Houska, IT-Albuquerque.

Project No. 3C1251.02
COE

Date: 11/07/89
Sheet No.: 010

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 3rd Round - monthly. RCRA gw sampling + analysis at the wastewater treatment lagoons.

Weather: Clear, sunny, low ~45°F. High ~72°F. High clouds building toward dusk.

Work Performed: Calibrated equipment, purged (5 well casing volumes) and sampled 5 monitor wells, packed samples for shipment via Federal Express, and hand delivered coliform bacteria samples to Las Cruces (within 6 hr holding time).

Sampling Performed: Up-gradient well S-2 (plus environmental duplicate) and down gradient wells MW-2, MW-3, MW-5 and MW-7.

Problems and Corrective Actions: See Sheet no 009 (11/06/89)

Quality Control Activities Initiated: Field equipment calibrated daily before + after field use. An environmental duplicate was collected at S-2. All samples were maintained under full chain of custody procedu

Signature: Ann M. Houska, IT-Albuquerque.

Project No. 301251.02.
COE

Date: 11/08/89
Sheet No.: 011

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 3rd Round - monthly RCRA gw sampling + analysis at the wastewater treatment lagoons.

Weather: Cool, winds at ~ 5-10 mph from the north-west, some clouds.

Work Performed: Calibrated equipment, purged (5 well casing volumes) and sampled 2 monitor wells, packed samples for shipment, hand delivered coliform bacteria samples to Las Cruces, replaced 2 locks on monitor wells MW-4 and MW-6, returned to Albuquerque, NM.

Sampling Performed: Up-gradient well MW-1 (plus QA samples for COE-Missouri River Div. Lab) and MW-8 (plus QA samples).

Problems and Corrective Actions: See sheet no. 009 (11/06/89)

Quality Control Activities Initiated: Field equipment calibrated daily before and after field use. Two sample rounds (with the exception of coliform bacteria) were collected for QA analysis by COE-Missouri River Division Lab. All samples were maintained under full chain of custody procedures.

Signature: Ann M. Hovska
JT - Albuquerque

FOURTH MONTHLY
GROUND WATER SAMPLING REPORT
DECEMBER 10 - DECEMBER 14, 1989
HOLLOMAN AIR FORCE BASE, NEW MEXICO

Prepared for:

HQ TAC/DEEV
Langley AFB, Virginia 23665-5542

Under contract with:

U.S. Army Corps of Engineers, Omaha District
215 North 17th Street, CEMRO-ED-EB
Omaha, Nebraska 68102-4978

Prepared by:

International Technology Corporation
5301 Central Avenue, N.E., Suite 700
Albuquerque, New Mexico 87108

May 1990

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APPENDIX A - JOB LOGS

APPENDIX B - FIELD DATA

APPENDIX C - SAMPLE CHAIN-OF-CUSTODY DOCUMENTATION

APPENDIX D - CERTIFICATES OF ANALYSES

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2	Concentrations of EPA Interim Primary Drinking Water Standards, Sewage Treatment Lagoons Monitoring Wells, Holloman Air Force Base, New Mexico, December 1989
3	Concentrations of Ground Water Quality Parameters, Sewage Treatment Lagoons Monitoring Wells, Holloman Air Force Base, New Mexico, December 1989
4	Concentrations of Ground Water Contamination Indicator Parameters, Sewage Treatment Lagoons Monitoring Wells, Holloman Air Force Base, New Mexico, December 1989
5	Method Detection Limits, Sewage Treatment Lagoons Monitoring Wells, Holloman Air Force Base, New Mexico, December 1989

1.0 INTRODUCTION

International Technology Corporation (IT) is the prime Architect-Engineer (A-E) contracted by the U.S. Army Corps of Engineers, Omaha District, to implement a Resource Conservation and Recovery Act (RCRA) Ground Water Monitoring Program (described in Code of Federal Regulations Title 40, Part 265 [40 CFR 265]) at the sewage lagoons and Lakes Holloman and Stinky, Holloman Air Force Base, New Mexico. The ground water monitoring program is being performed under Contract No. DACW45-88-D-0008 and in accordance with the December 22, 1989, signed Federal Facility Compliance Agreement (FFCA) between Holloman Air Force Base, the New Mexico Environmental Improvement Division, and the U.S. Environment Protection Agency, Region VI. As part of the ground water monitoring program, monitoring wells are being sampled at approximately monthly intervals for a total of four sampling rounds. The first round of sampling was performed in August, 1989, by Radian Corporation, Austin, Texas. This report describes the results of the fourth round of ground water sampling activities conducted at the Holloman Air Force Base sewage treatment lagoons during the period December 10 through 14, 1989. This schedule is an acceleration of the RCRA ground water monitoring program described in 40 CFR 265, Subpart F, to establish background concentrations for ground water parameters. RCRA ground water monitoring, as modified, has been followed to meet the requirements of the FFCA.

Ground water sampling was conducted in accordance with the Architect-Engineer Safety, Health and Emergency Response Plan (A-E SHERP) (IT, 1989) and the Architect-Engineer Quality Control Plan/Sampling Plan for Groundwater Study and Monitoring Program, Holloman Air Force Base, New Mexico (A-E QCP/SP) (IT, 1989b). The A-E QCP/SP is based on the Hydrogeologic Investigation Report and Groundwater Monitoring Plan for the Sewage Treatment Lagoons, Holloman Air Force Base, NM 88330 (Radian, 1989). The ground water monitoring plan was approved by the EPA in 1989.

In accordance with the ground water monitoring requirements of 40 CFR 265.92(b)(1), samples were collected and analyzed for concentrations of those parameters characterizing the suitability of the ground water as a drinking water supply (40 CFR 265, Appendix III). Concentrations of constituents characterizing ground water quality [40 CFR 265.92(b)(2)] and

ground water contamination indicator parameters [40 CFR 265.92(b)(3)] were also determined in the samples. Descriptions of field methods employed and a discussion of analytical and quality control results are provided below. Job logs documenting daily field activities are presented in Appendix A.

2.0 FIELD METHODS AND MEASUREMENTS

Field measurements made prior to ground water sample collection determined the presence or absence of organic vapors and nonaqueous phase liquids in the wells, well water-levels, and total well depths. This information led to calculation of well-bore water volumes, the volumes of water to be purged prior to well sampling, and the frequency of field pH and specific conductance measurements taken during well purging. Data forms documenting field measurement activities are provided in Appendix B.

2.1 ORGANIC VAPOR DETECTION

The presence of organic vapors in a well-bore atmosphere can be an indicator of nonaqueous phase liquids possibly being present in the well. Prior to measuring water levels in each well, the well head atmosphere was analyzed for organic vapors using a calibrated Hnu PI-101 field photoionization detector with a 10.2 eV lamp. Calibration of the Hnu instrument was accomplished using a standard reference gas (100 ppm isobutylene/air) prior to analyzing any well head atmospheres. Additionally, a background organic vapor concentration value was measured at each well location by sampling the atmosphere at large. Then, immediately after opening the monitor well cap, the detector was inserted into the well casing and the organic vapor content was measured. Well head organic vapor concentrations ranged from not detectable to 2.4 parts per million (ppm) in the Holloman monitoring wells. Two well head organic vapor measurement values exceeded on-site background values. The low concentrations of measurable organic vapors in the well head atmospheres and the fact that most of the well head organic vapor values were less than background indicated a probable absence of nonaqueous phase liquids in the wells.

2.2 WATER LEVEL, TOTAL DEPTH, AND IMMISCIBLE ORGANIC LAYER DETERMINATIONS

Water level, total well depth, and the location or absence of immiscible organic layers were determined by measurement from surveyed points indicated on the tops of the well casings. An ORS interface probe, calibrated using a steel surveyor's tape, was used to measure the distances between top of casing and both water surface and well bottom. The ORS probe creates a beeping tone when water is encountered and a steady tone when encountering immiscible layers either less dense or denser than water. Immiscible layers were not detected in any of the monitoring wells. Results of the water level and total well depth measurements, as well as calculated well volumes and sampling purge volumes, are listed in Table 1.

2.3 WELL EVACUATION

Well evacuation and ground water sampling were performed following procedures in the A-E QCP/SP. New protective clothing was donned by site personnel and nondedicated sampling equipment was decontaminated using nonphosphate detergent wash, tap water rinse, deionized water rinse, methanol and hexane rinses prior to actual well evacuations. Dedicated 1-1/2 inch diameter teflon bailers with stainless steel leaders attached to polypropylene ropes were used to purge and sample the wells. Approximately five well volumes of water were purged from the wells with five to seven measurements of pH, specific conductance, and temperature being recorded at intervals during bailing. Slightly turbid water and odors were noted in the bails from wells S-2, MW-5, MW-6, and S-4. An absence of particulates was noted in the bails from the remaining wells. Field notes describing the well evacuations are contained in Appendix B. Following the purge of approximately five well volumes of water from each monitoring well, collection of ground water samples began.

2.4 GROUND WATER SAMPLING

The monitor wells were sampled upon completion of the purging criteria. The wells sampled include the upgradient wells MW-1 and S-2, and downgradient wells MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and S-4. Quality assurance samples were also collected during this December, 1989, sampling episode. These samples included a blind field duplicate sample collected at well MW-1 and identified as well MW-12, two duplicate quality assurance sample collected at wells MW-1 and MW-8 which were forwarded to the U.S. Army Corps of Engineers,

Missouri River Division Laboratory, Omaha, Nebraska, for independent analysis, and a trip blank sample for purgeable organic halides (POX) identified as well MW-11. Concentrations of analytes which were sampled in each of the wells are listed in the tables of analytical results (Tables 2, 3, and 4).

Field Measurements

The parameters specific conductance, pH, and temperature were measured in the field during well purging, and before and after each sampling sequence. Specific conductance was determined using a Cole-Palmer model 1481-60 conductance meter in automatic temperature compensation mode. This meter is capable of determining the specific conductance of ground water over a wide range of values. This proved necessary to measure specific conductance of ground water from the Holloman sewage lagoon monitoring wells. All specific conductance measurements were made using the meter's 0 to 200,000 micromohs per centimeter (μ mhos/cm) scale. The meter was calibrated daily by standard solution at the scale midpoint. pH was determined using an Orion SA-250 meter, calibrated daily. Temperature was determined using a mercury in glass thermometer. These field measurements were recorded on the field sampling data sheets located in Appendix B. Specific conductance and pH measurements are also summarized in Table 4.

Sample Collection

Ground water samples were obtained from each well by carefully pouring from the dedicated teflon bailers. All samples were poured directly into prepared sampling containers. There were no field filtrations of samples. Clean surgical gloves were donned immediately prior to sample collection, and again immediately prior to collection of bacteriological samples. Ground water samples were collected for analysis in the following order:

Purgeable organic halides (POX)
Total organic carbon (TOC)
Pesticides
Herbicides
Metals
Phenolics
General chemistry (anions)
Nitrate and nitrite
Radiochemistry
Coliform bacteria.

Sample Containers and Preservatives

Sample collection containers were supplied by the International Technology Analytical Services (ITAS) laboratories in Cincinnati, Ohio, Austin, Texas, and Middlebrook (Knoxville), Tennessee. Appropriate sample preservatives were added to the containers at the laboratory prior to shipment.

2.5 SAMPLE HANDLING AND SHIPMENT

All samples were isolated in sealable plastic bags and placed on ice in a shipping cooler immediately after collection. Samples were shipped by overnight carrier in a sealed shipping container with complete chain-of-custody documentation to the ITAS laboratories in Middlebrook (Knoxville), Tennessee and Cincinnati, Ohio, and to the U.S. Army Corps of Engineers, Missouri River Division Laboratory in Omaha, Nebraska. Samples for radiochemistry analyses were forwarded by ITAS Middlebrook (Knoxville) laboratory to the ITAS laboratory in Oak Ridge, Tennessee, for analysis. Bacteriological samples were hand-carried with chain-of-custody documentation to the Soil, Water, and Plant Testing Laboratory, New Mexico State University, Las Cruces, New Mexico, for analysis. Chain-of-custody documentation for all samples are located in Appendix C.

3.0 ANALYTICAL RESULTS

Samples from each of the wells were analyzed for the parameters listed in the U.S. Environmental Protection Agency (EPA) Interim Primary Drinking Water Standards, ground water quality indicator parameters, and ground water contamination indicator parameters. Laboratory analytical reports containing analytical results, quality control results, and method detection limits are presented in Appendix D. Summaries of analytical results are presented in Tables 2, 3, and 4.

3.1 METHOD DETECTION LIMITS

Method detection limits (MDL) actually achieved by the analytical laboratories during analyses of the December, 1989, samples are listed in Table 5. All primary drinking water parameters were analyzed at MDLs equal to or less than the associated maximum contaminant levels with the exceptions of gross alpha and gross beta activities, and coliform bacteria. Samples for the

radiochemistry analyses, gross alpha and gross beta activities, could not be analyzed at MDLs less than the associated maximum contaminant levels because of the high dissolved solids concentrations in the samples.

Six out of eleven samples for coliform bacteria could not be analyzed at MDLs of 1 colony per 100 milliliters (ml) of sample due to excessive numbers of noncoliform bacteria present in the samples. All samples were analyzed by the New Mexico State University laboratory in triplicate, at as-received concentration, at a 10 times dilution, and at a 100 times dilution. Bacterial counting was performed on the least possible dilution. Analytical results reported in Table 2 reflect the minimum sample dilution at which laboratory personnel could enumerate bacterial colonies. Table values reported as less than 10 colonies per 100 ml, for example, indicate that the laboratory did not identify any coliform colonies in the sample at a 10 times sample dilution.

Excessive growth of noncoliform bacteria in the incubated samples, and sample dilutions, made accurate enumeration of coliforms difficult. Since method detection limits could not be achieved and estimates for method precision and accuracy are unavailable, the usefulness of these data for assessing the impact of the sewage treatment lagoons on local ground water conditions is doubtful. Coliform bacteria concentration is an indicator of drinking water quality, not potential RCRA hazardous waste components in ground water. The effect of the unlined sewage treatment lagoons at Holloman Air Force Base on local coliform concentrations in ground water is predictable; however, increased coliform bacteria concentrations are unlikely to be reliable indicators of hazardous waste migration from the lagoons.

3.2 PRIMARY DRINKING WATER STANDARDS

Concentrations of analytes listed as EPA Interim Primary Drinking Water Standards and their associated maximum contaminant levels are located in Table 2. All parameter concentrations were reported either less than or, within the range of maximum contaminant levels, with the following exceptions:

- Fluoride concentrations in samples from wells MW-2, MW-4, MW-6, MW-8, and S-4 were less than the 1.4 milligram per liter (mg/l) minimum concentration standard. Fluoride concentration in the sample from well S-2 (4.6 mg/l) exceeded the maximum contaminant level standard (2.4 mg/l) for drinking water.

samples in quadruplicate one day past holding time. Results of the quadruplicate reanalysis were identical to the single analysis performed previously.

Sample analysis holding times were exceeded by the ITAS Cincinnati laboratory on the POX analyses. The laboratory completed analyses of eight well samples for POX, six days after holding times expired, when equipment failure necessitated forwarding the remaining POX samples to the ITAS mixed waste laboratory in Oak Ridge, Tennessee, for analysis. Results of the December POX analyses are less than limits of detection and generally consistent with POX results obtained from earlier sampling episodes. All other parameters of the December well samples were analyzed within the prescribed holding times.

5.0 REFERENCES

International Technology Corporation (IT), 1989a, "Safety, Health & Emergency Response Plan (A-E SHERP)," Ground Water Detection Monitoring Program," Holloman Air Force Base, New Mexico.

International Technology Corporation (IT), 1090b, "A-E Quality Control Plan and Sampling Plan (A-E QCP/SP) For Groundwater Study and Monitoring Program," Holloman Air Force Base, New Mexico.

Radian Corporation, 1989, "Hydrogeologic Investigation Report and Proposed Groundwater Monitoring Plan for the Sewage Treatment Lagoons, Holloman Air Force Base, NM 88330," Holloman Air Force Base, New Mexico.

TABLE 1

GROUND WATER ELEVATIONS AND WATER VOLUMES PURGED FROM THE SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO DECEMBER 1989

MONITOR WELL	TOP OF[a] CASING ELEVATION (FAMSL)	DEPTH TO[b] GROUND WATER (FEET)	GROUND WATER ELEVATION (FAMSL)	TOTAL[b] DEPTH (FEET)	WELL VOLUME (GALLONS)	GALLONS DISCHARGED PRIOR TO SAMPLING	WELL VOLUMES DISCHARGED PRIOR TO SAMPLING
MW-1	4053.42	11.44	4041.98	17.81	4.1	21	5.1
S-2	4040.56	9.20	4031.36	20.24	1.8	10	5.6
MW-2	4039.78	5.33	4034.45	17.70	8.1	41	5.1
MW-3	4037.38	8.84	4028.54	17.73	5.8	29	5.0
MW-4	4030.30	6.23	4024.07	17.77	7.5	38	5.1
MW-5	4039.30	5.48	4033.82	17.73	8.0	40	5.0
MW-6	4031.21	8.32	4022.89	17.77	6.2	31	5.0
MW-7	4039.88	6.01	4033.87	17.70	7.6	38	5.0
MW-8	4040.50	6.41	4034.09	17.76	7.4	37	5.0
S-4	4034.46	9.55	4024.91	14.24	0.8	4	5.0

[a] A-E Groundwater Monitoring Report/Quality Control Summary for the First Groundwater Sampling Round Holloman Air Force Base, New Mexico, October 1989, Radian Corporation, Austin, TX.
[b] Reference from top of casing. Measured on December 10, 1989.

HOL:R-1386-T/1

TABLE 2

CONCENTRATIONS OF EPA INTERIM PRIMARY DRINKING WATER STANDARDS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO DECEMBER 1989

			MONITOR WELL					
PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	MW-1	MW-12 (DUPLICATE MW-1)	S-2	MW-2	MW-3	MW-4
Arsenic	µ g/l	50	9.3	9.9	1.5	4.9	3.2	3.6
Barium	µ g/l	1000	42.9	43.3	12.4	24.3	13.3	15.5
Cadmium	µ g/l	10	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U
Chromium	µ g/l	50	10-U	10-U	10-U	10-U	10-U	25.6
Fluoride	mg/l	1.4-2.4	1.5	1.5	4.6	1.3	1.4	0.9
Lead	µ g/l	50	6.4	8.0-U	3.7	5.0	3.8	5.6
Mercury	µ g/l	2	0.20-U	0.20-U	0.20-U	0.20-U	0.20-U	0.20-U
Nitrate (as N)	mg/l	10	2.9	2.5	2.5	0.06	0.07	0.06
Selenium	µ g/l	10	2.8	4.6	ND	ND	ND	ND
Silver	µ g/l	50	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U
Endrin	µ g/l	0.2	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Lindane	µ g/l	4	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Methoxychlor	µ g/l	100	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Toxaphene	µ g/l	5	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U
2,4-D	µ g/l	100	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U
2,4,5-TP Silvex	µ g/l	10	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Radium[a]	pCi/l	5	2.18 (0.38)	2.31 (0.41)	1.15 (0.26)	<5.0	<5.0	<5.0
Gross Alpha[a]	pCi/l	15	<700	250 (220)	134 (60)	<40	<125	<250
Gross Beta[a]	pCi/l	4 millirem/yr[b]	<715	<480	<560	<40	<110	100 (60)
Coliform Bacteria	col/100 ml	1/100 ml	<10	<10	<100	<1	<1	<1

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.
ND = Not detected. Lower limit of detection for selenium was 0.3 µ g/l.
[a]Values in parentheses represent error ranges of ± two standard deviations.
[b]Refer to Code of Federal Regulations Title 40, Part 141.16 (40 CFR 141.16) to relate analytical units (pCi/l) to maximum contaminant level (MCL).

TABLE 2

CONCENTRATIONS OF EPA INTERIM PRIMARY DRINKING WATER STANDARDS SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO DECEMBER 1989

(CONTINUED)

			MONITOR WELL				
PARAMETER	UNITS	MAXIMUM CONTAMINANT LEVEL	MW-5	MW-6	MW-7	MW-8	S-4
Arsenic	µ g/l	50	5.2	2.8	17.5	1.6	5.1
Barium	µ g/l	1000	42.0	35.8	20.8	23.9	29.6
Cadmium	µ g/l	10	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U
Chromium	µ g/l	50	10-U	10-U	10-U	10-U	10-U
Fluoride	mg/l	1.4-2.4	2.0	1.0	2.3	0.9	1.0
Lead	µ g/l	50	5.3	12.0-U	13.6	3.2	10.4
Mercury	µ g/l	2	0.20-U	0.20-U	0.20-U	0.20-U	0.20-U
Nitrate (as N)	mg/l	10	0.05-U	1.7	0.07	0.08	27
Selenium	µ g/l	10	ND	1.8	0.3	0.35	6.4
Silver	µ g/l	50	5.0-U	5.0-U	5.0-U	5.0-U	5.0-U
Endrin	µ g/l	0.2	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Lindane	µ g/l	4	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Methoxychlor	µ g/l	100	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Toxaphene	µ g/l	5	0.5-U	0.5-U	0.5-U	0.5-U	0.5-U
2,4-D	µ g/l	100	1.2-U	1.2-U	1.2-U	1.2-U	1.2-U
2,4,5-TP Silvex	µ g/l	10	0.1-U	0.1-U	0.1-U	0.1-U	0.1-U
Radium[a]	pCi/l	5	<5.0	7.58 (0.12)	<5.0	1.14 (0.29)	<5.0
Gross Alpha[a]	pCi/l	15	<85	<9	70 (36)	122 (83)	545 (344)
Gross Beta[a]	pCi/l	4 millirem/yr[b]	<86	<1	<40	105 (60)	<217)
Coliform Bacteria	col/100 ml	1/100 ml	<10	<1	<1	<10	<100

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.
ND = Not detected. Lower limit of detection for selenium was 0.3 µ g/l.
[a]Values in parentheses represent error ranges of ± two standard deviations.
[b]Refer to Code of Federal Regulations Title 40, Part 141.16 (40 CFR 141.16) to relate analytical units (pCi/l) to maximum contaminant level (MCL).

TABLE 3

CONCENTRATIONS OF GROUND WATER QUALITY PARAMETERS
SEWAGE TREATMENT LAGOONS MONITORING WELLS
HOLLOMAN AIR FORCE BASE, NEW MEXICO
DECEMBER 1989

		MONITOR WELL					
PARAMETER	UNITS	MW-1	MW-12 (DUPLICATE MW-1)	S-2	MW-2	MW-3	MW-4
Chloride	mg/l	27,000	34,000	930	1,300	3,400	3,200
Iron	µ g/l	165	229	73.2	345	431	344
Manganese	µ g/l	11.1	23.5	124	817	1,370	446
Phenols	mg/l	0.01-U	0.01-U	0.01-U	0.01-U	0.01-U	0.01-U
Sodium	mg/l	7,690	7,860	667	548	2,470	1,640
Sulfate	mg/l	2,400	1,500	1,900	2,800	2,800	2,400

		MONITOR WELL				
PARAMETER	UNITS	MW-5	MW-6	MW-7	MW-8	S-4
Chloride	mg/l	4,900	55,000	1,000	1,400	49,000
Iron	µ g/l	434	59.6	55.6	345	1,230
Manganese	µ g/l	2,030	608	684	572	38.4
Phenols	mg/l	0.01-U	0.01-U	0.01-U	0.01-U	0.01-U
Sodium	mg/l	1,330	15,300	513	1,600	9,710
Sulfate	mg/l	1,400	5,600	1,900	1,600	9,200

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.

TABLE 5

METHOD DETECTION LIMITS, SEWAGE TREATMENT LAGOONS MONITORING WELLS
HOLLOMAN AIR FORCE BASE, NEW MEXICO
DECEMBER 1989

PARAMETER	DETECTION LIMIT
TOC	1 mg/L
POX	0.005/0.010 mg/L
Chloride	0.5 mg/L
Sulfate	1.5 mg/L
Phenols	0.01 mg/L
Nitrate/Nitrite	0.05/0.01 mg/L
Fluoride	0.1 mg/L
Arsenic	0.3 μ g/L
Lead	14 μ g/L[a]
Mercury	0.2 μ g/L
Selenium	0.3 μ g/L
Iron	50 μ g/L
Manganese	2 μ g/L
Sodium	200 μ g/L
Barium	2 μ g/L
Cadmium	5 μ g/L
Chromium	10 μ g/L
Silver	5 μ g/L
Endrin	0.1 μ g/L
Lindane	0.1 μ g/L
Methoxychlor	0.1 μ g/L
Toxaphene	0.5 μ g/L
2,4-D	1.2 μ g/L
2,4,5-TP (Silvex)	0.1 μ g/L
Radium	5.0 pCi/l
Gross Alpha	700 pCi/l[a]
Gross Beta	715 pCi/l[a]
Coliform Bacteria	<100/100 mL[a]

[a]Detection limits are variable and sample specific. Value reported is the maximum limit of detection reported for any individual sample. Detection limits for most samples are less than table value.

APPENDIX A

JOB LOGS

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE - HAFB

DATE Sunday 121089

LOCATION HAFB - WWT Area Lagoons

JOB NUMBER 301251.02.04

WORK PERFORMED PID, TD + Depth to gw measurement at 10 monitor well prior to gw sample collection

PREPARED BY: A. Houska

SUPERVISOR D. Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APS	A Houska	0730	1345	—	1800	1800	10.5
Sr Tech	D. Dyer	0730	1345	—	1800	1800	10.5
Tech	J. Saavadra	0730	1345	—	1800	1800	10.5

AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT
1 Day	HNu PID				
1 Dy	ORS Interface Probe				
1 Bx	Latex Surgical Gloves				
1 Day	Decon Equipment				
5 gal	Distilled Water				
2 each	Rental Vehicles				

TIME	FIELD ACTIVITY DAILY LOG
0730	Meet at IT Warehouse; Complete packing of equipment + supplies.
0750	Drive to vehicle rental office/agency.
0805	Arrive at rental agency. Get 2 rental vehicles (cargo van + 4 wheel drive vehicle).
0845	Leave rental agency. Return to warehouse. Load equipment
0935	Leave IT warehouse. Drive to Holloman AFB (alamogordo, NM).
1325	Arrive at HAFB. Check in at security gate.
1345	Arrive at WWT area. Pick up necessary equipment (methanol + hexane).
1410	Arrive at MW-01. Calibrate equipment. Begin fluid-level + PID measurements at 10 monitor wells.
1740	Measurements completed. Recalibrate equipment. Leave sampling area.
1800	Arrive at Motel in alamogoro. Check in. Unload gear. STOP.

COMPLETE ONE SHEET FOR EACH SHIFT

30-8-85(12 5M)

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE - HAFB

DATE Monday 121189

LOCATION NWT Area Lagoons

JOB NUMBER 301251.02.04

WORK PERFORMED Purge + sample monitor wells - RCRA.

PREPARED BY: Ann Houska

SUPERVISOR Dann Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc	A Houska	0700	0750	1/2 hr	1740	1820	
Sr. Tch	D. Dyer	0700	0750	—	1305		
Tch	J. Saavedra	0700	0750	1/2 hr	1740	1820	

AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT
2 each	Rental Vehicles		Decon Equipment	5 Bags	Ice
4 pr	Nitrile gloves		Sampling Equipment		
8 ea	Tyvek Suits	1 day	pH Meter	—	Sample containers
6 pr	Cotton gloves/liners	1 day	S. Conductivity Meter	—	Dedicated Bailer
3/4 bx	Surgical gloves vinyl	1 day	Thermometer		
1/4 roll	Visqueen	3/4 bag	Vermiculite		

TIME	FIELD ACTIVITY DAILY LOG
0700	Pack gear in vehicles; calibrate equipment. Drive to HAFB.
	Stop for ice enroute.
0750	Arrive at MW-06. Prep for purging + sample collection.
0810	Begin purging well MW-06. Collect samples
0920	Move to S-4. Prep for sample collection
1015	Sample collection complete at S-4. Return to MW-06 to
	purge 1 casing volume + collect coliform bacteria sample.
1040	Leave MW-06.
1110	Arrive at MW-04. Prep for purging/sampling
1130	Begin purging MW-04. Collect Samples
1245	Complete sampling at MW-04. Clean-up site; Recalibrate
	equipment.
1305	IT leaves back area. D. Dyer drives to Las Cruces to deliver
	coliform samples. A. Houska, J. Saavedra to NWT area to
	pack gear samples. Stop for supplies on-route.

COMPLETE ONE SHEET FOR EACH SHIFT

30-8-85(12 SM)

1320 A. Houska, J. Saavedra break for lunch (1/2 hr).

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE – HAFB

DATE Wednesday 121389

LOCATION WWT Area Lagoons

JOB NUMBER 301251 C2.01

WORK PERFORMED RCRA gw sample collection.

PREPARED BY: Ann Houska

SUPERVISOR Dawn Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc.	A. Houska	0700	0735	—	1710	~~1800~~ 1730	10.5 hrs
Sr. Tech	D. Dyer	0700	0735	—	1255	1700	10 hrs
Tch.	J. Saavedra	0700	0735	—	1710	~~1800~~ 1730	10.5 hrs

AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT
2 each	Rental Vehicles	3 1/4 Bx	Surgical gloves	4 pr.	nitrile Gloves.
8 sks	ice		Decon equipmt.		
5 gal.	Distilled Water		Sampling Equipmt.		
1 Sk.	Vermiculite	1 day	pH Meter		
6 ea.	white tyvek suits	1 day	S. Cond. Meter		
6 pr.	cotton glove	1 day	Thermometer		

TIME	FIELD ACTIVITY DAILY LOG
0700	Load gear, calibrate equipment, drive to WWT Area. Stop at store to purchase ice en route.
0750	Arrive at MW-8. Set up + purge monitor well. Collect samples.
0940	Sample collection complete. Pack samples.
1000	IT Moves to MW-1 to collect normal, QA and environmental duplicate.
1230	Off of MW-1.
	Move to S-2 to purge + collect samples.
1250	Well sampling completed. Finish clean up.
1255	D Dyer leaves to drive coliform bacteria ~~back~~ to Los Cruces
	A. Houska, J. Saavedra to store to purchase supplies (packing)
	and make telephone calls.
	Return to WWT area shed. Complete paperwork + package
	samples.
1610	Fed X picks up coolers. A. Houska + J. Saavedra leave -AE3

COMPLETE ONE SHEET FOR EACH SHIFT

30-8-85(12.5M)

~~4:00 D. Dyer returns.~~

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE - HAFB

DATE Wed. 121389

LOCATION

JOB NUMBER 301251.02.04

WORK PERFORMED See page 1

PREPARED BY:

SUPERVISOR

TIME	FIELD ACTIVITY DAILY LOG
	to purchase locks
1630	D. Dyer returns from Las Cruces; recalibrates field equipment.
1700	Stop - D. Dyer
1655	A Houskeg, J. Saavedra return to HAFB replace locks on MW-1 and
	MW-5. Return to motel unload gear
1730	STOP - A. Houskea, J. Saavedra.

COMPLETE ONE SHEET FOR EACH SHIFT

30-6-85(12 5M)

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY CDE - Holloman AFB

DATE Thursday 12/14/87

LOCATION Wastewater Treatment Lagoons

JOB NUMBER 301251 02 04

WORK PERFORMED RCRA GW Sample Collection.

PREPARED BY: A. Houska

SUPERVISOR Dann Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSC	A. Houska	0800	—	—	—	1230	4.5 hrs
Sr Tech	D. Dyer	0800	—	—	—	1300	5 hrs.
Tech	J Saavedra	0800	—	—	—	1300	5 hrs.

AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT
	NA				

TIME	FIELD ACTIVITY DAILY LOG
0800	IT - load equipment / gear in vehicles. Check out of motel,
	fuel-up vehicles. Drive to Albuquerque, NM.
1210	Arrive at IT Warehouse. Unpack gear.
1230	A. Houska - STOP. / D. Dyer + J. Saavedra return vehicles to
	rental agency.
1300	D. Dyer + J. Saavedra STOP.

COMPLETE ONE SHEET FOR EACH SHIFT

30-8-85 (12 SM)

APPENDIX B

FIELD DATA

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-011289*
DATE SAMPLED	121389
TIME	1045 (1)
SAMPLER'S INITIALS	AH, ~~ML, JB~~ D.D., TS
WELL/BORING LOCATION	MW-1
WELL/BORING DIAMETER (in)	4"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4053.42 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.81
Depth to Groundwater (ft)	11.44
CALCULATIONS	
Thickness of Groundwater (ft)	6.37
Well Volume (gallons)	4.14 gal
Purge Volume (gallons) for five casing volumes	20.72 gal
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

° HNu PID Background= ~~0.2~~ 0.2 ppm; Well borehole= 0.00 ppm.
Date 121089; Time 1445

° See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.

° See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1045. (time = 1130)

* Also collected QAMW011289 and Environmental Duplicate (MW-121289) at this mon tor well. No coliform bact. or ITAS-Cinc. metal parameters were collected for QMW-011289. This set was sent to USACE-Missouri River Div. Lab.

(continued next page)

Well No. MW-1
Date 121289
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 6.99

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1025 -	4	19.0c	6.81	58,000	CLEAR - NO ODOR
1032 -	8	18.5c	6.79	58,800	CLEAR - NO ODOR
1039 -	12	18.5c	6.75	60,400	CLEAR - NO ODOR
1046 -	16	18.5c	6.74	60,500	CLEAR - NO ODOR
1053 -	20	18.5c	6.77	60,900	CLEAR - NO ODOR
1058 -	21	18.5c	6.74	59,400	CLEAR - NO ODOR

Reading after sample collection: - Quadruplicate

1201 -	19.0c	6.76	59,200	CLEAR - NO ODOR
1205 -	19.0c	6.73	59,900	CLEAR - NO ODOR
1209 -	19.0c	6.75	59,500	" "
1213 -	19.0c	6.74	59,200	" "

Additional Comments:

MW-011289 parameters were collected 1st, followed by QA, followed by ~~first~~ environmental duplicate. all bottles of that parameter in a set were filled prior to switching to new sample set (ie: Rad Chem, 2 bottles per set: 1st both sample containers were filled for MW-011289, next QA, next MW-121289) a new bailer full of gwater was used if the sample set was crossed over. Cinc. metals for MW-01 and MW-12 were collected after the normal metals (at all sets). For MW-011289, 4 POX containers and 2 TOC containers were collected (for quadruplicate

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	S-021289*
DATE SAMPLED	121389
TIME	~~1245~~ 1300 (1)
SAMPLER'S INITIALS	AH, ~~ML, JB~~ DP, JS
WELL/BORING LOCATION	S-2
WELL/BORING DIAMETER (in)	2"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	20.24'
Depth to Groundwater (ft)	9.20'
CALCULATIONS	
Thickness of Groundwater (ft)	11.04
Well Volume (gallons)	1.80
Purge Volume (gallons) for five casing volumes	8.98 gal
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.0 ppm; Well borehole= 0.00 ppm.
  Date 121089; Time 0853
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = ~~1245~~ 1300

* Four POX samples and two TOC sample containers filled to meet quadruplicate analysis requirement.

Well No. ~~MW-1~~ S-2
Date 12138A
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 6.99

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1254	2	16.0c	7.15	6,400	Heavy clear. Sewer Smell —
1257	4	16.5c	7.18	6300	" " "
1300	6	16.5c	7.18	6,00	med. " "
1303	8	16.5c	7.20	5,900	" " "
1306	10	16.5c	7.19	5,700	" slight " "

Reading after sample collection: - Quadruplicate.

1)	1337 -	16.5c	7.25	7,400	Slight Clear - Sewer Smell
2)	1340 -	17.0c	7.26	6,800	" " "
3)	1343 -	17.0c	7.23	7,300	" " "
4)	1346 -	17.0c	7.23	7,300	" " "

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-031289
DATE SAMPLED	121289
TIME	0900 (1)
SAMPLER'S INITIALS	AH, ~~ML, JB~~ DD, JS
WELL/BORING LOCATION	MW-3
WELL/BORING DIAMETER (in)	4"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4037.38' FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.73'
Depth to Groundwater (ft)	8.84'
CALCULATIONS	
Thickness of Groundwater (ft)	8.89'
Well Volume (gallons)	5.78 gal
Purge Volume (gallons) for five casing volumes	28.91 gal
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.2 ppm; Well borehole= 0.00ppm.
  Date 121089 ; Time 1549
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1045 . - One Casing volume removed prior to collection of the Coliform Bacteria Sample

Well No. MW-3
Date 12/2/87
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.01

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
[illegible]	5	14.00	7.07	13,400	[illegible]
0824	10	15.00	7.10	12,100	" "
0830	15	16.00	7.08	[illegible]	"
[illegible]	20	17.00	7.07	11,700	
0844	25	17.00	7.08	11,500	" "
0850	29	17.00	7.08	11,600	" "

Reading after sample collection:

0912	17.0c	7.09	13 300	"

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-041289
DATE SAMPLED	121189
TIME	1230 (1)
SAMPLER'S INITIALS	AH, ~~ML, JB~~ DD, JS
WELL/BORING LOCATION	MW-4
WELL/BORING DIAMETER (in)	4"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4030.30 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.77'
Depth to Groundwater (ft)	6.23'
CALCULATIONS	
Thickness of Groundwater (ft)	11.54
Well Volume (gallons)	7.51 gal
Purge Volume (gallons) for five casing volumes	37.53 gal
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.2 ppm; Well borehole= 0.0 ppm.
  Date 121089; Time 1735
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1230.

Well No. MW-04
Date 12/1/89
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.01

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1137	5	15.0C	6.73	11,000	Light Green - No Odor
1143	10	16.0C	6.75	10,800	Clear - Sewer Smell
1149	15	15.5C	6.75	10,900	Clear - " "
1154	20	17.5C	6.74	11,100	Clear - Sewer Smell
1201	25	17.0C	6.74	11,500	Clear Sewer Smell
1206	30	17.5C	6.74	11,300	Clear - Sewer - Smell
1213	35	18.5C	6.74	11,400	Clear - Sewer Smell
1217	38	18.5C	6.71	11,500	Clear - Sewer Smell

Reading after sample collection:

1240		18.5C	6.73	12,400	Clear - Sewer Smell

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-051289
DATE SAMPLED	121289
TIME	1250 (1)
SAMPLER'S INITIALS	AH, ~~ML~~, ~~JB~~ DD; JS
WELL/BORING LOCATION	MW-5
WELL/BORING DIAMETER (in)	4"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4039.30 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.73'
Depth to Groundwater (ft)	5.48'
CALCULATIONS	
Thickness of Groundwater (ft)	12.25'
Well Volume (gallons)	7.99
Purge Volume (gallons) for five casing volumes	39.84
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.2 ppm; Well borehole= 2.4 ppm.
  Date 121089; Time 1517
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1250.

Well No. MW-5
Date 121289
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.01

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1201	6	17.5c	7.07	12,700	Clear Sewer Smell
1206	12	17.0c	6.93	12,200	Light Black Silt
1215	18	17.0c	6.89	12,600	" " "
1219	24	17.0c	6.92	12,700	" " "
1226	30	17.0c	6.87	12,700	" " "
1234	36	17.0c	6.84	12,900	" " "
1238	40	17.0c	6.82	12,900	" " "

Reading after sample collection:

1258	17.0c	6.82	13,200	H2O clear Some smells like sewer

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-061289
DATE SAMPLED	121189
TIME	0900 (1)
SAMPLER'S INITIALS	AH, ~~ML, JB~~ DP, JS
WELL/BORING LOCATION	MW-6
WELL/BORING DIAMETER (in)	4"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4031.21 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.77'
Depth to Groundwater (ft)	8.32'
CALCULATIONS	
Thickness of Groundwater (ft)	9.45
Well Volume (gallons)	6.15 gal
Purge Volume (gallons) for five casing volumes	30.74 gal
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.2 ppm; Well borehole= 0.00 ppm.
  Date 121089; Time 1701
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1015.
One casing volume was purged after sampling other ~~se~~ parameters, but prior to sampling coliform bacteria.

Well No. MW-6
Date 121189
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.00

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
[illegible]	5	14.5c	[illegible]	85,700	[illegible]
0831	10	14.0c	7.12	89,700	"
0837	15	16.0	6.99	87,900	clear [illegible]
0843	20	15.5c	6.94	89,900	" "
0849	25	16.5	6.88	92,300	" "
0855	31	16.5	6.90	88,800	" "

Reading after sample collection:

0917	17.0c	6.87	92,900	"

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-071289
DATE SAMPLED	121289
TIME	14~~00~~20(1)
SAMPLER'S INITIALS	AH, ~~ML, JB~~ DD, JS
WELL/BORING LOCATION	MW-7
WELL/BORING DIAMETER (in)	4"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4039.88 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.70'
Depth to Groundwater (ft)	6.01'
CALCULATIONS	
Thickness of Groundwater (ft)	11.69'
Well Volume (gallons)	7.60 gal
Purge Volume (gallons) for five casing volumes	38.02 gal
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

° HNu PID Background= 0.2 ppm; Well borehole= 0.6 ppm.
Date 121089 ; Time 1533

° See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.

° See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 14~~00~~20 .

Well No. MW-7
Date 121289
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.01

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1338	5	17.5c	6.94	5,900	CLEAR NO SIGHT
1346	10	17.5c	6.98	6,300	"
1353	15	18.0c	6.95	6,400	"
1359	20	18.0c	6.96	6,300	" " "
1405	25	17.5c	6.96	6,200	" " "
1412	30	17.5c	7.03	5,400	" " "
1418	35	17.5c	6.98	5,700	" "
1422	38	17.5c	7.01	5,400	"

Reading after sample collection:

1442	17.5c	6.98	4,900	" " "

Additional Comments:

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-081289*
DATE SAMPLED	121389
TIME	0920 (1)
SAMPLER'S INITIALS	AH, ~~ML, JB~~ DD, JS
WELL/BORING LOCATION	MW-8
WELL/BORING DIAMETER (in)	4"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4040.50' FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	6.41'
Depth to Groundwater (ft)	17.76'
CALCULATIONS	
Thickness of Groundwater (ft)	11.35
Well Volume (gallons)	7.38 gal
Purge Volume (gallons) for five casing volumes	36.92 gal
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.2 ppm; Well borehole= 0.00 ppm.
  Date 121089; Time 1618
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 0930. One casing volume purged prior to collection of Coliform Bacteria

Qa sample, id = QMW-081289, also collected at this monitor well. Parameters were alternate station [illegible] IT's sample. A new [illegible] used between wells (continued)

Well No. MW-8
Date 12/3/91
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 6.77

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
[illegible]	5	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	6.72	[illegible]	[illegible]
[illegible]	15	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	20	16.50	6.73	[illegible]	[illegible]
[illegible]	25	16.50	7.00	5,700	[illegible]
0837	30	16.00	6.98	5800	[illegible]
0842	35	16.00	6.96	6200	[illegible]
0845	37	16.50	6.96	6,500	[illegible]

Reading after sample collection:

0914	16.50	6.95	5100	[illegible]

Additional Comments:

No coliform bact. or ITAS-Cinc. metal collected for QA set. All bottles for a given parameter were filled prior to switching over sample sets.

IT Project No. 301251.02

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	S-041289
DATE SAMPLED	121189
TIME	1800 (1)
SAMPLER'S INITIALS	AH, ~~ML, JB~~ DD, JS
WELL/BORING LOCATION	S-4
WELL/BORING DIAMETER (in)	2"
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	~~0~~ FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	14.24'
Depth to Groundwater (ft)	9.55
CALCULATIONS	
Thickness of Groundwater (ft)	4.69'
Well Volume (gallons)	0.76 gal
Purge Volume (gallons) for five casing volumes	3.81 gal
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

° HNu PID Background= 0.2 ppm; Well borehole= 0.0 ppm.
Date 121089; Time 1712

° See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.

° See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = 1600.

IT CORPORATION

COE-HAFB
Proj No 301251.02.c

WATER LEVEL INDICATOR CALIBRATION

After use:

EQUIPMENT NUMBER ORS Interface Probe SN-06-01535

EQUIPMENT NAME —

DATE 121089 DATE LAST CALIBRATED 121089

CALIBRATION ~~PERIOD~~ Against a stainless steel measuring tape to 40 feet.

Interface Probe MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)
0	NA								
5.00	5	105		205		305		405	
10.00	10	110		210		310		410	
15.00	15	115		215		315		415	
20.00	20	120		220		320		420	
25.00	25	125		225		325		425	
30.00	30	130		230		330		430	
35.00	35	135		235		335		435	
40.00	40	140		240		340		440	
45		145		245		345		445	
50		150		250		350		450	
55		155		255		355		455	
60		160		260		360		460	
65		165		265		365		465	
70		170		270		370		470	
75		175		275		375		475	
80		180		280		380		480	
85		185		285		385		485	
90		190		290		390		490	
95		195		295		395		495	
100		200		300		400		500	

NOTE: ACCEPTANCE IS ± 0.1 FEET

SIGNED [illegible]

APPENDIX C

SAMPLE CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118691

C/C Control No. 115078

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214464

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No
MW-061289	Monitor Well MW-6	121189; 0900	Ground water	Amber glass	cold + intact BH 12/13/89	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 121189; 1550

   Received By: Beth Morrow, ITAS, 12-13-89 0800

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00139

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118691
C/C Control No. 115078

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-091

DATE SAMPLES SHIPPED: 121189
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-061289	Ground water	250 ml	ice; H_2SO_4	TOC ✓	See attached sheets
		1 L	;	Pest ✓	for specific
		~~1 L~~ 2x 500 ml amb	; HNO_3	T. Metals ✓	analytical requirements
		1 L	; H_2SO_4	Phenolics ✓	
		1 L		Wet Chem ✓	
		~~1 L~~ 2x500 ml amb	; H_2SO	NO_2, NO_3 ✓	
		2 x 1 L		Rad Chem ✓ *	Lab filter and preserve
		1 L		Herb ✓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY
Received By Beth Monroe Date/Time 12-13-89, 0800

WHITE - Original, to accompany samples
YELLOW - Field copy

00138

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 111525

C/C Control No. 117295

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, ~~M. Lyon~~ AMH

CARRIER/WAYBILL NO. Federal Express 4330214464

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S-041289	Monitor Well S-4	121189, 1000	Ground Water	Amber glass	Cold Intact BM 121389	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is recived damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp; 121189; 1552

   Received By: Beth Monroe, ITAS, 12-13-89, 0800

2. Relinquished By: _____

   Received By: _____

3. Relinquished By: _____

   Received by: _____

4. Relinquished By: _____

   Received By: _____

00142

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111525
C/C Control No. 117295

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-091

DATE SAMPLES SHIPPED: 121189
LAB DESTINATION: ITAS-KNOXVILLE
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-041289	Ground water	250 ml	ice; H_2SO_4	TOC ✓	See attached sheets
↓	↓	1 L	;	Pest ✓	for specific
		~~1 L~~ 2 x 500 ml amb	; HNO_3	T. Metals ✓	analytical requirements
		1 L	; H_2SO_4	Phenolics ✓	
		1 L		Wet Chem ✓	
		~~1 L~~ 2X500 ml amb	; H_2SO_4	NO_2, NO_3 ✓	
		2 x 1 L		Rad Chem ✓ *	Lab filter and preserve.
		1 L		Herb ✓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Beth Monroe Date/Time 121389, 1100

WHITE - Original, to accompany samples
YELLOW - Field copy

001143

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 111524

C/C Control No. 115079

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214464

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No
MW-041289	Moniter Well MW-04	121189; 1230	Ground water	Amber glass	Cold & intact 12.13.89	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann Houska, ITCorp, 121189; 1551

   Received By: Beth Monroe, ITAS, 12-13-89, 0800

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00135

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111524
C/C Control No. 115079

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-091

DATE SAMPLES SHIPPED: 121189
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-041289	Ground water	250 ml	ice; H_2SO_4	TOC ✓	See attached sheets
↓	↓	1 L	;	Pest ✓	for specific
		~~1 L~~ 500ml X2 amt	; HNO_3	T. Metals ✓	analytical requirements.
		1 L	; H_2SO_4	Phenolics ✓	
		1 L		Wet Chem ✓	
		~~1 L~~ 500 ml x 2 amt	; H_2SO_4	NO_2, NO_3 ✓	
		2 x 1 L		Rad Chem ✓ *	LAB filter and preserve.
↓	↓	1 L	↓	Herb ✓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By Beth Monroe **Date/Time** 12-13-89, 0800

WHITE - Original, to accompany samples
YELLOW - Field copy

00133

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118696

C/C Control No. 105486

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Cincinnati

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214103

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-061289	Monitor Well MW-06	121189; 0900	Ground Water	CPE	[illegible]	
MW-061289	" " "	; 0900		Amber Glass	[illegible]	
S-041289	Monitor Well S-4	; 1000		CPE		
S-041289	" " "	; 1000		Amber Glass		
MW-041289	Monitor Well MW-04	; 1230		CPE	Sample bottles properly preserved JF	
MW-041289	" " "	; 1230		Amber Glass		
MW-111289	Trip Blank	121089; 0730		CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 121189; 1555

   Received By: Lauri Rotelli ITAS 12/13/89

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

RECEIVED

FEB 22 1990

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118696
C/C Control No. 1054186

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-090

DATE SAMPLES SHIPPED: 121189
LAB DESTINATION: ITAS-Cincinnati
LABORATORY CONTACT: Craig Caldwell
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-061289	Ground water	250 ml	ice ; HNO_3	A) Total As, Total Se	See attached sheets
MW-061289	↓	↓	; H_2SO_4	B) POX	for specific
S-041289			; HNO_3	(A)	analytical requirements
S-041289			; H_2SO_4	(B)	
MW-041289			; HNO_3	(A)	
MW-041289			; H_2SO_4	(B)	
MW-111289			; H_2SO_4 (?)	(B)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ **Flammable** ____ **Skin Irritant** ____ **Highly Toxic** ____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By [illegible] **Date/Time** [illegible]

RECEIVED
FEB 22 1990

WHITE - Original, to accompany samples
YELLOW - Field copy

COE ALB FRO

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 111522

C/C Control No. 115124

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214431

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-031289	Monitor Well MW-03	121289; 0900	Ground Water	Amber glass	Cobalt intact 121389	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska; ITCorp; 121289; 1500

Received By: Beth Monroe, ITAS 12-13-89, 0800

2. Relinquished By:

Received By:

3. Relinquished By:

Received by:

4. Relinquished By:

Received By:

WHITE - To accompany samples
YELLOW - Field copy

001131

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111522
C/C Control No. 115124

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-091

DATE SAMPLES SHIPPED: 121289
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-031289	Ground Water	250 ml	ice; H_2SO_4	TOC ✓	See attached sheets
		1 L	;	Pest ✓	for specific
		~~1 L~~ 500 ml x2	; HNO_3	T. Metals ✓	analytical requirements.
		1 L	; H_2SO_4	Phenolics ✓	
		1 L		Wet Chem ✓	
		~~1 L~~ 500 ml x2	; H_2SO_4	NO_2, NO_3 ✓	
		2 x 1 L		Rad Chem ✓ *	Lab filter and preserve.
		1 L		Herb ✓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Beth Monroe Date/Time 12/13-89, 0800

WHITE - Original, to accompany samples
YELLOW - Field copy

00132

TIA 1778

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 111516

C/C Control No. 115126

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214431

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No
MW-021289	Monitor Well MW-2	121289; 1030	Ground Water	Amber glass	Cold & intact 121389	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann Houska, IT Corp, 121289, 1502

   Received By: Beth Monroe, ITAS, 12-13-89, 0800

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00134

WHITE - To accompany samples
YELLOW - Field copy

ITAP 4477D

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111516
C/C Control No. 115126

PROJECT NAME: COE-Holloman AFb
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-090

DATE SAMPLES SHIPPED: 121289
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-021289	Ground water	250 ml	ice; H_2SO_4	TOC ✓	See attached sheets
↓	↓	1 L	;	Pest ✓	for specific
		~~1L~~ 2x500 ml amb	; HNO_3	T. Metals ✓	analytical requirements.
		1 L	; H_2SO_4	Phenolics ✓	
		1 L		Wet chem ✓	
		~~1 L~~ 2x500 ml amb	; H_2SO_4	NO_2, NO_3 ✓	
		2 x 1 L		Rad Chem ✓ *	Lab filter and preserve
		1 L		Herb ✓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Beth Monroe Date/Time 12-13-89, 0800

WHITE - Original, to accompany samples
YELLOW - Field copy

00130

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 111506

C/C Control No. 115125

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214431

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No
MW-051289	Monitor Well MW-5	121289; 1250	Ground Water	Amber glass	Cold & intact 121389	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska; ITCorp; 121289; 1507

   Received By: Beth Monroe, ITAS, 12 13 89 0800

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE To accompany samples
YELLOW Field copy

00136

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111506
C/C Control No. 115125

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International TEchnology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-090

DATE SAMPLES SHIPPED: 121289
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-051289	Ground Water	250 ml	iced; H_2SO_4	TOC ✓	See attached sheets
↓	↓	1 L	;	Pest ✓	for specific
		~~1L~~ 500 ml x 2 amt	; HNO_3	T.Metals ✓	analytical requirements
		1 L	; H_2SO_4	Phenolics ✓	
		1 L	;	Wet Chem ✓	
		~~1 L~~ 500 ml x 2 amt	; H_2SO_4	NO_2, NO_3 ✓	
		2 x 1 L		Rad Chem ✓ *	Lab filter and preserve.
		1 L		Herb ✓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Beth Monroe Date/Time 12-13-89, 0800

WHITE - Original, to accompany samples
YELLOW - Field copy

001137

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 111523

C/C Control No. 115080

PROJECT NAME/NUMBER: COE-Holloman AFB/301251.02.04

LAB DESTINATION: ITAS-Knoxville

SAMPLE TEAM MEMBERS: A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214431

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No
MW-071289	Monitor Well MW-7	121289; 1420	Groundwater	Amber glass	Cold + intact BOH 12-13-89	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [signature]; IT Corp; 121289; 1508

   Received By: Beth Monroe, ITAS, 12-13-89, 0800

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00140

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111523
C/C Control No. 115080

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-090

DATE SAMPLES SHIPPED: 121289
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-071289	Ground water	250 ml	ice; H_2SO_4	TOC ✓	See attached sheets
		1 L	;	Pest ✓	for specific
		~~1 L~~ 2 X 500 ml amb	; HNO_3	T. Metals ✓	analytical requirements.
		1 L	; H_2SO_4	Phenolics ✓	
		1 L		Wet Chem ✓	
		~~1 L~~ 2 X 500 ml amb	; H_2SO_4	NO_2, NO_3 ✓	
		2 x 1 L		Rad Chem ✓ *	Lab filter and preserve.
		1 L		Herb ✓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Beth Monroe Date/Time 12-13-89, 0800

WHITE - Original, to accompany samples
YELLOW - Field copy

00141

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. [illegible]

C/C Control No. 145620

PROJECT NAME/NUMBER ITNA 4-[illegible]

LAB DESTINATION IT [illegible]

SAMPLE TEAM MEMBERS

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
* KK0952	MW-021289	12-12-89	Water	2 x 1 l plastic		
KK0953	MW-031289	↓	↓	↓		
KK0954	MW-041289	12-11-89				
KK0955	MW-051289	12-12-89				
KK0956	MW-061289	12-11-89				
KK0957	MW-071289	12-12-89				
KK0958	S-041289	12-11-89				

Special Instructions: * go by KK# listed on paperwork. disregard extra 0 on sample tape, please filter 1 [illegible]

Possible Sample Hazards: all samples prior to analysis. Please report both KK# & MW# [illegible]

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Beth Moore, ITAS, 12-13-89, 1400

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00144

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118825
C/C Control No. [illegible]

PROJECT NAME [illegible]
PROJECT NUMBER
PROJECT MANAGER
BILL TO [illegible] PO# 46620
[illegible]

PURCHASE ORDER NO. Job# 46000 01

DATE SAMPLES SHIPPED [illegible]
LAB DESTINATION IT [illegible]
LABORATORY CONTACT [illegible]
SEND LAB REPORT TO

DATE REPORT REQUIRED 12 21 87
PROJECT CONTACT [illegible]
PROJECT CONTACT PHONE NO. [illegible]

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
KK0[illegible]	[illegible]	2 X 1 L		Gross Alpha, Gross Beta, Radium 226 + 228 on all samples	See Gross Alpha
KK0[illegible]					
KK0[illegible]					
KK0[illegible]					
KK0[illegible]					
KK0[illegible]					
KK0[illegible]					

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ **Rush** ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ **Flammable** ____ **Skin Irritant** ____ **Highly Toxic** ____ **Other** ____ **(Please Specify)**

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ **Disposal by Lab** ✓

FOR LAB USE ONLY

Received By ____ **Date/Time** ____

WHITE - Original, to accompany samples
YELLOW - Field copy

00145

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118704

C/C Control No. 105488

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Cincinnati

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214136

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-031289	Monitor Well MW-3	121289; 1045	Ground water	CPE		
MW-031289	" " "	; 1045		Amber Glass		
MW-021289	Monitor Well MW-2	; 1030		CPE	No seals on cooler	
MW-021289	" " "	; 1030		Amber Glass		
MW-051289	Monitor Well MW-5	; 1250		CPE	Sample	
MW-051289	" " "	; 1250		Amber Glass	note properly preserved	
MW-071289	Monitor Well MW-7	; 1420		CPE		
MW-071289	" " "	; 1420		Amber Glass	+ in good condition	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann Mitkowski, ITCorp, 121289; 1503

   Received By: L. L. Pell ITAS 12/12/89

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

RECEIVED

FEB 22 1990

IT CORP. - ALBUQUERQUE

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118704
C/C Control No. 105488

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology, 5301 Central Ave, NE Suite 700, Albuquerque, NM 87108
PURCHASE ORDER NO.: 90-090

DATE SAMPLES SHIPPED: 121289
LAB DESTINATION: ITAS - Cincinnati
LABORATORY CONTACT: Craig Caldwell
SEND LAB REPORT TO: International Technology, 5301 Central Ave, NE, Suite 700, Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-031289	Ground water	250 ml	Ice ; HNO_3	(A) Total As, Total Se.	See attached sheet for specific analytical requirements
MW-031289	↓	↓	; H_2SO_4	(B) POX	
MW-021289			; HNO_3	(A)	
MW-021289			; H_2SO_4	(B)	
MW-051289			; HNO_3	(A)	
MW-051289			; H_2SO_4	(B)	
MW-071289			; HNO_3	(A)	
MW-071289			; H_2SO_4	(B)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By [illegible] Date/Time [illegible]

RECEIVED
FEB 22 1990
IT CORP. - ALBUQUERQUE

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106729

C/C Control No. 105555

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION NM State University-Las Cruces

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Hand Delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-031289	Monitor Well MW-3	121289; ~~1420~~ 1045	Ground water	CPE; Sterile		
MW-021289	" " MW-2	; 1030				
MW-051289	" " MW-5	; 1250				
MW-071289	" " MW-7	; 1420				

Special Instructions: IF sample is recieved damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska; IT Corp; 121289; 1647

   Received By: Deborah Hughes, NMSU, 12-12-89, 1647

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106729
C/C Control No. 105555

PROJECT NAME	COL-Holloman AFB	DATE SAMPLES SHIPPED	~~11~~/12/89
PROJECT NUMBER	301251.02.04	LAB DESTINATION	NM State University-Las Cruces
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Andy Bristol
BILL TO	International Technology Corp. 5301 Central Ave NE, Suite 700 Albuquerque, NM 87108	SEND LAB REPORT TO	International Technology Corp. 5301 Central Ave NE, Suite 700 Albuquerque, NM 87108
PURCHASE ORDER NO.	N/A	DATE REPORT REQUIRED	~~11/ /89~~ 01/02/90
		PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505) 252-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-031289	Ground Water	~~120~~ 200 ml	iced	Coliform Bacteria	See attached sheets
MW-021289	↓	↓	↓	↓	for specific
MW-051289					analytical requirements.
MW-071289					

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of [redacted]ances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118692

C/C Control No. 115081

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214475

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-081289	Monitor Well MW-8	121389; 0920	Ground water	Amber glass	OK, SAK, 12-14-89	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska; IT Corp; 121389; 1500

   Received By: SA Kennedy, ITAS, 12-14-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00134

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118692
C/C Control No. 115081

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-091

DATE SAMPLES SHIPPED: 121389
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010289
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-081289	Ground water	250 ml	ice; H_2SO_4	TOC	See attached sheets
		1 L	;	Pest	for specific
		~~1 L~~ 2X 500 ml	; HNO_3	T. MEtals	analytical requirements.
		1 L	; H_2SO_4	Phenolics	
		~~1 L~~ 2X500 ml		Wet Chem	
		1 L	; H_2SO_4	NO_2, NO_3	
		1 L X 2		Rad Chem *	Lab filter and preserve.
		~~2 x~~ 1 L		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 12-14-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

001130

ITN 144789

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106745

C/C Control No. 115082

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214475

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No
MW-011289	Monitor Well MW-1	121389; 1045	Ground water	Amber glass	OK, SAK 12-14-89	
				Amber glass		
				CPE		
				Amber glass		
				CPE		
				CPE		
				CPE		
				Amber glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp; 121385; 1530

   Received By: Sa Kennedy, ITAS, 12-14-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00133

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106745
C/C Control No. 115082

PROJECT NAME	COE-Holloman AFB	DATE SAMPLES SHIPPED	121389
PROJECT NUMBER	301251.02.04	LAB DESTINATION	ITAS-Knoxville
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Mary Tyler
BILL TO	International Technology	SEND LAB REPORT TO	International Technology
	5301 Central Ave, NE Suite 700		5301 Central Ave, NE, Ste 700
	Albuquerque, NM 87108		Albuquerque, NM 87108
PURCHASE ORDER NO.	90-0971	DATE REPORT REQUIRED	010290
		PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-011289	Ground Water	~~250~~ 125 ml X 2	ice ; H_2SO_4	TOC x 4 * (Quadruplicate)	See attched sheets
		1 ~~gal~~ l	;	Pest, ~~Herb~~	for specific analytical
		~~1 L~~ 2x500ml	; HNO_3	T. Metals	requirements
		1 L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		~~1 L~~ 2X500ml	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem *	Lab filter and preserve.
		1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By Sa Kennedy **Date/Time** 12-14-87 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00129

TNC 44739

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106732

C/C Control No. 117292

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, ~~M. Lyon~~ amH

CARRIER/WAYBILL NO. Federal Express 4330214475

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-121289	Monitor Well MW-12	121389; 1130	Ground Water	Amber Glass	OK, Sat, 12-14-89	
				"		
				CPE		
				Amber Glass		
				CPE		
				"		
				"		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological.

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska; IT Corp; 121389; 1525

   Received By: Sd Kennedy, ITAS, 12-14-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00135

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106732
C/C Control No. 117292

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave NE Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-~~077~~ 091 amt

DATE SAMPLES SHIPPED: 121389
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology
5301 Central Ave NE Ste 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-121289	Ground Water	amt 125 ~~250~~ ml	ice ; H_2SO_4	TOC	See attached sheets
		1 ~~gal~~ l amt		Pest, ~~Herb~~ amt	for specific analytical
		amt ~~1 L~~ 2 X 500 ml	; HNO_3	T. Metals	requirements.
		1 L	; H_2SO_4	Phenolics	
		1 L	;	Wet Chem	
		~~1 L~~ 2 X 500 ml amt	; H_2SO_4	NO_2, NO_3	
		2 x 1L		Rad Chem	* Lab Filter and Preserve *
		1 l amt		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 12-14-89 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

001131

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 106744

C/C Control No. 117293

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, ~~M. Lyon~~ Amh

CARRIER/WAYBILL NO. Federal Express 4330214475

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S-021289	Monitor Well S-2	121389; 1300	Ground Water	Amber Glass	OK, SGK 12-14-89	
				"		
				CPE		
				Amber Glass		
				CPE		
				CPE		
				CPE		
				Amber Glass		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, ITCorp; 121389; 1520

   Received By: SA Kennedy, ITAS, 12-14-89 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00136

WHITE - To accompany samples
YELLOW - Field copy

021289

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 106744
C/C Control No. 117293

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: 90-~~077~~ 091 amH

DATE SAMPLES SHIPPED: 121389
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: ~~International Technology~~
5301 Central Ave, NE, Ste 700
~~Albuquerque, NM 87108~~
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-021289	Ground Water	amH 25 ~~250~~ ml x 2	Ice ; H_2SO_4	*TOC x 4 (Quadruplicate)	See attached sheets
		1 ~~gal~~ l		Pest ~~, Herb~~	for specific analytical
		amH ~~L~~ 500ml x 2	; HNO_3	T. MEtals	requirements.
		1 L	; H_2SO_4	Phenolics	
		1 L		Wet Chem	
		amH ~~1 L~~ 500 ml x 2	; H_2SO_4	NO_2, NO_3	
		2 x 1 L		Rad Chem	*Lab filter and preserve*
		1 l		Herb	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By Sa Kennedy **Date/Time** 12-14-89 0800

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001132

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. _____

C/C Control No. 145634

PROJECT NAME/NUMBER LTAA 99787

LAB DESTINATION IT BSL

SAMPLE TEAM MEMBERS _____

CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
KK1029	MW-011289	12/15/89	Water	2x1L poly		
KK1030	MW-081289	↓	↓	↓		
KK1031	MW-121289					
KK1032	S-021289					

Special Instructions: Lab filter + preserve

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: SA Kennedy, ITAS, 12-14-89, 1400

   Received By: _____

2. Relinquished By: _____

   Received By: _____

3. Relinquished By: _____

   Received by: _____

4. Relinquished By: _____

   Received By: _____

00137

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118790
C/C Control No. [illegible]

PROJECT NAME: [illegible]
PROJECT NUMBER: [illegible]
PROJECT MANAGER:
BILL TO: [illegible] (PC 4620)

DATE SAMPLES SHIPPED: [illegible]
LAB DESTINATION: [illegible]
LABORATORY CONTACT:
SEND LAB REPORT TO: IT Corp. Philadelphia PA

PURCHASE ORDER NO. 486000.04

DATE REPORT REQUIRED: Normal
PROJECT CONTACT: Stacy Tyler
PROJECT CONTACT PHONE NO. 588-6401

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
KK 1027	Water	2 l	none	Gross Alpha, Gross Beta, Radium 226 & 228	Filter prior + preserve
KK 1030	↓	↓	↓	↓	↓
KK 1031					
KK 1032					

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal ✓ Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy

00128

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. ~~105487~~ 118705 amH

C/C Control No. 146003

PROJECT NAME/NUMBER CDE-Holloman AFB/301251.02.04

LAB DESTINATION ITAS-Cincinnati

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Federal Express 4330214114

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-011289	Monitor Well MW-1	121389 ; 1045	Groundwater	(A) CPE	RECEIVED	
MW-011289	" " "	; 1045		(B) Amber Glass		
MW-121289	" " MW-12	; 1130		(A)	FEB 16 1990	
MW-121289	" " MW-12	; 1130		(B)		
MW-081289	" " MW-8	; 0920		(A)	IT CORP.-ALBUQUERQUE	
MW-081289	" " "	; 0920		(B)		
S-021289	" " S-2	; 1300		(A)	Noseals or broken or sample bottles	
S-021289	" " S-2	; 1300		B		AR samples were

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp; 121389; 1545

   Received By: [illegible] ITAS 12/14/89

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118705
C/C Control No. 146003

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-090

DATE SAMPLES SHIPPED: 121389
LAB DESTINATION: ITAS-Cincinnati
LABORATORY CONTACT: Craig Caldwell
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, Nm 87108
DATE REPORT REQUIRED: 010290
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-011289	Groundwater	125 ml	HNO_3 (C)	A) Total As, Total Se.	See attached sheets
MW-011289		4 x 125 ml	H_2SO_4 (D)	B) POX x4 (Quad on up-grad well)	for specific
MW-121289		125 ml	(C)	(A)	analytical requirements.
MW-121289		125 ml	(D)	(B) x1	
MW-081289		125 ml	(C)	(A)	
MW-081289		125 ml	(D)	(B) x1	
S-021289		125 ml	(C)	(A)	
S-021289		4 x 125 ml	D	(B) x4 (Quad. on up-grad well).	

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FEB 16 1990
IT CORP.-ALBUQUERQUE

Hise / Lee

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Mitch Date/Time [illegible]

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 166746
C/C Control No.

PROJECT NAME: Holloman AFB
PROJECT NUMBER: 3003-375 (Charge PN 4005)
PROJECT MANAGER: Craig Caldwell
BILL TO: ITAS Cincinnati

DATE SAMPLES SHIPPED: 1/22/90
LAB DESTINATION: Oak Ridge
LABORATORY CONTACT: Mary Hull
SEND LAB REPORT TO: ITAS Cincinnati
11499 Chester Rd
Cincinnati OH 45246

ITAC 35788 sl 1-24-90 35787

PURCHASE ORDER NO.: ITC-90121
JTN 805242

DATE REPORT REQUIRED: 2/7/90
PROJECT CONTACT: Craig Caldwell
PROJECT CONTACT PHONE NO.: 513-782-4600

Sample No.	~~Sample Type~~ Cincinnati lab #	Sample Volume	Preservative	Requested Testing Program	Special Instructions
		Sample type +			
MW-011289	T9-12-123-01 ~~A~~ B-E	H_2O 4X 250mL	none	POX	Analyze in qual.
MW-0121289	-02B	250mL			Analyze singly
MW-081289	-03B	250mL			Analyze singly
S-021289	-04B-E	4X 250mL			Analyze in qual.
~~MW~~					
	Sampled 12/13/89 - Holding	times waived			

RECEIVED
FEB 16 1990
IT CORP. - ALBUQUERQUE

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal ✓ Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ✓ Flammable ____ Skin Irritant ? brine Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab ✓

FOR LAB USE ONLY
Received By D. Kimelbrew Date/Time 1-23-90/0930

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118069

C/C Control No. 105554

PROJECT NAME/NUMBER OU-Holloman AFB/301251.02.04

LAB DESTINATION NM State University-Las Cruces

SAMPLE TEAM MEMBERS A. Houska

CARRIER/WAYBILL NO. Hand Delivered

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-081289	Monitor Well MW-8	121389, 0930	Groundwater	CPE; Sterile		
MW-011289	" " MW-1	121389; 1045	↓	↓		
MW-121289	" " MW-12	↓; 1130				
S-021289	" " S-2	↓; 1300				

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp; 121389; 1315
   Received By: David Dyer, IT Corp: 121389 1315
2. Relinquished By: David Dyer, IT Corp: 121389 1505
   Received By: Andrew Lee Bristol, NMSU 121389 1505
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118669
C/C Control No. 10[illegible]

PROJECT NAME: COE-Tulloch AFB
PROJECT NUMBER: 30121.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: N/A

DATE SAMPLES SHIPPED: 12/13/89
LAB DESTINATION: NM State University-Las Cruces
LABORATORY CONTACT: Andy Bristol
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 01/02/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-081289	Ground Water	~~120~~ 200 ml	iced	Coliform Bacteria	See attached sheets for specific analytical requirements.
MW-011289	↓	↓	↓	↓	
MW-121289	↓	↓	↓	↓	
S-021289	↓	↓	↓	↓	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By Andrew Bristol Date/Time 12-13-89

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. [illegible]

C/C Control No. 146002

PROJECT NAME/NUMBER COE Hillsboro AFB / 301251.02.04 LAB DESTINATION USACE - Missouri River Lab

SAMPLE TEAM MEMBERS A Houston CARRIER/WAYBILL NO. Federal Express [illegible]

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-01 121389	Monitor Well MW-1	121389; 1045	Ground Water	Amber Glass		
QMW-01 121389				"		
				"		
				"		
				CPE		
				Amber Glass		
				CPE		
				"		
				"		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houston, ITCorp, 121389; 1501

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111478
C/C Control No. 146002

PROJECT NAME: COE - Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp. 5301 Central Ave, NE Suite 700 Albuquerque, NM 87108
PURCHASE ORDER NO.: NA

DATE SAMPLES SHIPPED: 121389
LAB DESTINATION: USACE - Missouri River Div. Lab
LABORATORY CONTACT: Dr. Joe Slosky
SEND LAB REPORT TO: International Technology Corp. 5301 Central Ave, NE, Suite 700 Albuquerque, NM 87108
DATE REPORT REQUIRED: 010289
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-011289	Ground Water	~~250~~ 125 ml	ice; H_2SO_4	TOC	See Attached sheets
		250 ml	H_2SO_4	POX	for specific
		1 l	none	Pest	Analytical
		1 l	none	Herb	requirements.
		2 x 500 ml	HNO_3	T. Metals	
		1 l	H_2SO_4	Phenolics	
		1 l	H_2SO_4	Wet Chem	
		2 x 500 ml	none	NO_2, NO_3	
		1 l	~~H~~ none	Rad Chem *	Lab filter + preserve *

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. [illegible]

C/C Control No. 146001

PROJECT NAME/NUMBER COE - Holloman AFB / 301251.02.04 LAB DESTINATION USACE - Missouri River Division

SAMPLE TEAM MEMBERS A Hanska CARRIER/WAYBILL NO. Federal Express [illegible]

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-08	1281 Monitor Well MW-8	121389, 0920	Ground Water	Amber Glass		
				"		
				"		
				"		
				CPE		
				Amber Glass		
				CPE		
				"		
				"		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Hanska, IT Corp, 121389, 1503

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111476
C/C Control No. 146001

PROJECT NAME: COE - Holloman AFB
PROJECT NUMBER: 301251.02.04
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corp. 5301 Central Ave, NE Suite 700 Albuquerque, NM 87108
PURCHASE ORDER NO.: NA

DATE SAMPLES SHIPPED: 121389
LAB DESTINATION: USACE Missouri River Div Lab
LABORATORY CONTACT: Dr. Joe Slosky
SEND LAB REPORT TO: International Technology Corp. 5301 Central Ave, NE Suite 700 Albuquerque, NM 87108
DATE REPORT REQUIRED: 010289
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-081289	Ground Water	250 ml	ice; H_2SO_4	TOC	See Attached
↓	↓	250 ml	H_2SO_4	POX	sheets for
		1 l	none	Pest	specific
		1 l	none	Herb	analytical
		2 x 500 ml	HNO_3	T. Metals	requirements.
		1 l	H_2SO_4	Phenolics	
		1 l	none	Wet Chem	
		2 x 500 ml	H_2SO_4	NO_2, NO_3	
↓	↓	1 l	none	Rad Chem *	Lab filter + preserve *

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

APPENDIX D

CERTIFICATES OF ANALYSES

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

January 4, 1990

Job Number: ITNA 44789

P.O. Number: 301251.02.04

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	12/14/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 12/14/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for the requested pesticides and herbicides gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection based on EPA SW-846 method 9060.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

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II. Analytical Results/Methodology (continued)

The samples were analyzed for phenols by colorimetric determination using EPA SW-846 method 9065.

The samples were analyzed for nitrate and nitrite by colorimetric determination using EPA method 353.3.

The samples were analyzed for requested anions by ion chromatography using EPA method 300.0.

The samples were analyzed for fluoride by potentiometric determination using EPA method 340.2.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were extracted for pesticides and herbicides on 12/15/89. The samples were analyzed on 12/21/89 and 12/28/89. No problems were encountered.

The samples were analyzed for TOC on 12/22/89. No problems were encountered.

The phenol analyses were performed on 01/02/90. No problems were encountered.

The nitrate and nitrite analyses were performed on 12/29/89. No problems were encountered.

The anion analyses were performed on 01/02/90. No problems were encountered.

The fluoride determination was performed on 12/20/89. No problems were encountered.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44789

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	Method Blank	MW-011289
Lab Sample ID:	BLA0234/A0244	KK1021/KK1025
Lindane	0.1 U	0.1 U
Endrin	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U
Silvex	0.1 U	0.1 U
Date Extracted:	12/15/89	12/15/89
Date Analyzed:	12/28/89	12/21/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44789

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	MW-081289	MW-121289	S-021289
Lab Sample ID:	KK1022/KK1026	KK1023/KK1027	KK1024/KK1028
Lindane	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U
Date Extracted:	12/15/89	12/15/89	12/15/89
Date Analyzed:	12/21/89	12/21/89	12/21/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44789

TOTAL ORGANIC CARBON ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
MW-011289	KK0999	1
MW-081289	KK1000	4
MW-121289	KK1001	1
S-021289	KK1002	6
Method Blank	D0339	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 12/22/89

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44789

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Chloride	Sulfate	Fluoride
Method Blank	P0775/P0749	0.5 U	1.5 U	0.1 U
MW-011289	KK1003	27,000	2,400	1.5
MW-081289	KK1004	1,400	1,600	0.9
MW-121289	KK1005	34,000	1,500	1.5
S-021289	KK1006	930	1,900	4.6
Date Analyzed:		01/02/90	01/02/90	12/20/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44789

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Nitrate, as N	Nitrite, as N
Method Blank	P0769/P0771	0.05 U	0.01 U
MW-011289	KK1013	2.9	0.01 U
MW-081289	KK1014	0.08	0.01
MW-121289	KK1015	2.5	0.01 U
S-021289	KK1016	2.5	0.02
Date Analyzed:		12/29/89	12/29/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44789

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Phenols
Method Blank	P0777	0.01 U
MW-011289	KK1017	0.01 U
MW-081289	KK1018	0.01 U
MW-121289	KK1019	0.01 U
S-021289	KK1020	0.01 U
Date Analyzed:		01/02/90

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

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JAN 19 1990
IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Mark Lyon

January 12, 1990

Job Number: ITNA 44789 (addendum certificate)

P.O. Number: 301251.02.04

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	12/14/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 12/14/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical result before it is reported.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection based on EPA SW-846 method 9060.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were analyzed in quadruplicate for TOC on 01/11/90. No problems were encountered.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

International Technology
January 12, 1990

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44789
(addendum certificate)

TOTAL ORGANIC CARBON ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
MW-011289	KK0999	1
MW-011289	KK0999	1
MW-011289	KK0999	1
MW-011289	KK0999	1
S-021289	KK1002	6
S-021289	KK1002	6
S-021289	KK1002	6
S-021289	KK1002	6
Method Blank	D0365	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 01/11/90

ITAS KNOXVILLE LABORATORY

NONCONFORMANCE MEMO

PROJECT CODE: ITNA 44789 FILED BY: DRL DATE: 1/12/90

SAMPLE(S) AFFECTED: KK 0999, KK 1002 (client ID's MW-011289 and S-021289, respectively)

AREA: CODING ____ GC ✓ GC/MS ____ HPLC ____ PREP ____ METALS ____ GEN CHEM ____ OTHER ____

NONCONFORMANCE (Check appropriate item(s)):

____ Not enough sample received for proper analysis.

____ Sample received ☐broken ☐without proper preservative ____ ☐without proper refrigeration ____ ☐in improper container ____ ☐with custody seal missing or broken ☐ with illegible sample numbers or labels missing.

____ Sample received with incomplete paperwork: ☐Request for Analysis form missing ☐Chain-of-Custody form missing/unrelinquished ☐billing instructions incomplete ☐no due date or TAT specified ☐method for sample disposition not specified ☐numbers on paperwork different than numbers on bottles ____ ☐other ____

✓ Holding time exceeded ☐at receipt ☒in the lab by 1 days. Reason. Quadruplicate analysis request was not noticed during initial runs. ~~Sought at billing~~ MET 1-12-

____ Sample lost during extraction/analysis; no re-prep or re-analysis possible. Reason: ____

____ QC sample data reported to client outside of ☐method ☐internal ☐QAPP ☐contract ☐regulatory limits. Reason: ____

____ Incorrect preparation/analysis procedure(s) used; no re-prep or re-analysis possible. Reason: ____

____ Samples analyzed and reported under an invalid calibration curve.

____ Incorrect/incomplete data reported to client. Specify: ____

____ Blank contamination; no re-prep of associated samples done or possible. Reason: ____

____ Reported detection limits higher than specified in ☐method ☐contract ☐QAPP, due to ☐matrix ☐insufficient sample ☐instrumentation ☐other ____

____ Other (specify) ____

CORRECTIVE ACTION: (said to analyze anyway.)

✓ Client (Name: Mark Lyon) informed verbally by METyler on 1-10-90 by MET

____ Client informed in writing on ____ by ____

✓ Sample(s) processed "as is".

____ Sample(s) preserved in laboratory (specify): ____

____ Sample(s) on hold until ____

✓ Other Samples rerun one day past holding time per MET (per client)

Corrective action initiated/performed by Dan Longmeier Date 1/12/90

Operations Concurrence: MEtyler Date 1-12-90

QC Concurrence: Elizabeth Y Towery Date 1-12-90

CORRECTIVE ACTION VERIFICATION

✓ Verified

____ Cannot verify. Reason ____

QC Coordinator: Elizabeth Y Towery Date 1-12-90

THIS DOCUMENT MUST BE RETAINED IN THE PROJECT FILE

ITAS-K-QA039R0

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

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JAN 02 1990

IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer 1/2/90

December 22, 1989

Job Number: ITNA 44789

P.O. Number: 301251.02.04

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	12/14/89
Number of Samples:	Four (4)
Sample Type:	Water

I. Introduction

On 12/14/89, four (4) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all CLP data are not blank corrected.

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

The arsenic and selenium analyses were cancelled by the client on 12/18/89.

Reviewed and Approved:

Mary Tyder

Mary Tyder
Laboratory Project Manager

III. Quality Control

The samples were digested on 12/19/89 for ICP and 12/18/89 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 12/18/89; the GFAA analysis for lead was performed on 12/18/89; the remaining metals were analyzed by ICP on 12/20/89. All run QC was acceptable. A duplicate/spike pair was analyzed using sample MW-011289. Spike recovery (accuracy) results were outside control limits for manganese and silver. A post digestion spike was run for manganese. Duplicate RPD (precision) results were outside control limits for chromium.

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-011

SOW No.: 7/87

EPA Sample No.	Lab Sample ID.
MW-011289 OS	KK1007 OS
MW-011289 D	KK1008 D
MW-011289 S	KK1009 S
MW-081289	KK1010
MW-121289	KK1011
S-021289	KK1012

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

METALS Lab Manager: _____

Date: _____

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply
X - Detection limits higher than normal due to sample matrix interferences.

U.S. EPA - CLP

00003

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-011289

Lab Name: ITAS_KNOXVILLE Contract: COE-HOLLOMANAFB

Lab Code: ITSTU Case No.: ITNA 44789 SAS No.: SDG No.: MW-011289

Matrix (soil/water): WATER Lab Sample ID: KK1007

Level (low/med): Date Received: 12/14/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	42.9	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U	*	P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	165			P
7439-92-1	Lead	6.4		W	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	11.1	B	NE	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U	N	P
7440-23-5	Sodium	7,690,000			P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

00004

EPA SAMPLE NO.

MW-081289

Lab Name: ITAS_KNOXVILLE Contract: COE-HOLLOMANAFB

Lab Code: ITSTU Case No.: ITNA 44789 SAS No.: SDG No.: MW-011289

Matrix (soil/water): WATER Lab Sample ID: KK1010

Level (low/med): Date Received: 12/14/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	23.9	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U	*	P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	345			P
7439-92-1	Lead	3.2	B	W	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	572		NE	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U	N	P
7440-23-5	Sodium	~~1,600,000~~ ~~16000000~~			P
7440-28-0	Thallium	CWK 12/21/89			NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

00005

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-121289

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44789_____ SAS No.: _____ SDG No.: MW-011289_

Matrix (soil/water): WATER Lab Sample ID: KK1011____

Level (low/med): _____ Date Received: 12/14/89

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__				NR
7440-39-3	Barium___	43.3	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__	5.0	U		P
7440-70-2	Calcium__				NR
7440-47-3	Chromium_	10	U	*	P
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron_____	229			P
7439-92-1	Lead_____	8.0	U		F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	23.5		NE	P
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___	5.0	U	N	P
7440-23-5	Sodium___	7,860,000			P
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc_____				NR
	Molybdenu				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts: ___

Comments:

FORM I - IN

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

S-021289

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44789_____ SAS No.: _____ SDG No.: MW-011289_

Matrix (soil/water): WATER Lab Sample ID: KK1012____

Level (low/med): _____ Date Received: 12/14/89

% Solids: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_				NR
7440-36-0	Antimony_				NR
7440-38-2	Arsenic__				NR
7440-39-3	Barium___	12.4	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium__	5.0	U		P
7440-70-2	Calcium__				NR
7440-47-3	Chromium_	10	U	*	P
7440-48-4	Cobalt___				NR
7440-50-8	Copper___				NR
7439-89-6	Iron____	73.2	B		P
7439-92-1	Lead____	3.7	B	W	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	124		NE	P
7439-97-6	Mercury__	0.20	U		CV
7440-02-0	Nickel___				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium_				NR
7440-22-4	Silver___	5.0	U	N	P
7440-23-5	Sodium___	667,000			P
7440-28-0	Thallium_				NR
7440-62-2	Vanadium_				NR
7440-66-6	Zinc____				NR
	Molybdenu				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts: ___

Comments:

FORM I - IN

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00007

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: TNA 44789_____ SAS No.: _____ SDG No.: MW-011289

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40000.0	39977.2	99.9	40000.0	40648.36	101.6	39747.87	99.4	P
Antimony	4000.0	3974.27	99.4	4000.0	4001.89	100.0	3814.71	95.4	P
Arsenic	4000.0	3653.17	91.3	4000.0	3675.61	91.9	3838.96	96.0	P
Barium	4000.0	3909.71	97.7	4000.0	3991.51	99.8	4200.19	105.0	P
Beryllium	4000.0	4120.52	103.0	4000.0	4185.62	104.6	4066.20	101.7	P
Cadmium	4000.0	4116.60	102.9	4000.0	4092.25	102.3	4241.27	106.0	P
Calcium	40000.0	39060.5	97.7	40000.0	38949.67	97.4	38974.35	97.4	P
Chromium	4000.0	3863.27	96.6	4000.0	3889.72	97.2	4021.98	100.5	P
Cobalt	4000.0	4027.28	100.7	4000.0	4039.61	101.0	4256.28	106.4	P
Copper	4000.0	3860.60	96.5	4000.0	3904.13	97.6	4192.80	104.8	P
Iron	40000.0	43414.9	108.5	40000.0	43792.40	109.5	43316.85	108.3	P
Lead	4000.0	3795.32	94.9	4000.0	3796.93	94.9	3943.82	98.6	P
Magnesium	40000.0	41554.1	103.9	40000.0	41793.56	104.5	41415.05	103.5	P
Manganese	4000.0	3878.47	97.0	4000.0	3912.67	97.8	4116.07	102.9	P
Mercury	4.0	4.07	101.8	4.0	4.02	100.5	4.07	101.8	CV
Nickel	4000.0	4125.10	103.1	4000.0	4133.44	103.3	4100.41	102.5	P
Potassium	40000.0	41712.0	104.3	40000.0	40969.81	102.4	39905.20	99.8	P
Selenium	4000.0	4007.46	100.2	4000.0	3918.35	98.0	4212.31	105.3	P
Silver	4000.0	3867.29	96.7	4000.0	3872.24	96.8	4127.24	103.2	P
Sodium	40000.0	37755.4	94.4	40000.0	38267.50	95.7	37163.60	92.9	P
Thallium	4000.0	3937.63	98.4	4000.0	3929.06	98.2	4215.37	105.4	P
Vanadium	4000.0	3823.94	95.6	4000.0	3850.86	96.3	4069.37	101.7	P
Zinc	4000.0	3839.46	96.0	4000.0	3840.80	96.0	3964.21	99.1	P
Molybdenu	4000.0	4230.14	105.8	4000.0	4234.37	105.9	4222.91	105.6	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

00008

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: TNA 44789_____ SAS No.: _____ SDG No.: MW-01/289

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	40019.61	100.0			P
Antimony				4000.0	3777.94	94.4			P
Arsenic				4000.0	3898.88	97.5			P
Barium				4000.0	4201.52	105.0			P
Beryllium				4000.0	4046.36	101.2			P
Cadmium				4000.0	4246.72	106.2			P
Calcium				40000.0	39162.14	97.9			P
Chromium				4000.0	4015.37	100.4			P
Cobalt				4000.0	4180.99	104.5			P
Copper				4000.0	4057.37	101.4			P
Iron				40000.0	43428.23	108.6			P
Lead				4000.0	3891.01	97.3			P
Magnesium				40000.0	41883.37	104.7			P
Manganese				4000.0	4040.70	101.0			P
Mercury				4.0	3.97	99.2			CV
Nickel				4000.0	4002.52	100.1			P
Potassium				40000.0	41338.95	103.3			P
Selenium				4000.0	4136.27	103.4			P
Silver				4000.0	4010.01	100.3			P
Sodium				40000.0	37677.84	94.2			P
Thallium				4000.0	4099.76	102.5			P
Vanadium				4000.0	3978.85	99.5			P
Zinc				4000.0	3993.65	99.8			P
Molybdenu				4000.0	4189.02	104.7			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00009

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44789_____ SAS No.: _____ SDG No.: MW-01/289

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	50.0	48.38	96.8	50.0	54.15	108.3	54.80	109.6	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Molybdenu									NR

(1) Control Limits: **Mercury** 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00010

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44789_____ SAS No.: _____ SDG No.: MW- 011289

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	54.41	108.8	53.06	106.1	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Molybdenu									NR

(1) Control **Limits:** **Mercury** 80-120; Other **Metals** 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00011

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44789_____ SAS No.: _____ SDG No.: MW-011289_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	54.79	109.6			F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Molybdenu									NR

(1) Control Limits: **Mercury** 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

2B

CRDL STANDARD FOR AA AND ICP

00012

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44789_____ SAS No.: _____ SDG No.: MW-011289

AA CRDL Standard Source: NBS_____

ICP CRDL Standard Source: NBS_____

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony				120.0	97.07	80.9	93.00	77.5
Arsenic				60.0	65.02	108.4	59.04	98.4
Barium								
Beryllium				10.0	10.30	103.0	9.99	99.9
Cadmium				10.0	10.92	109.2	10.12	101.2
Calcium								
Chromium				20.0	18.68	93.4	19.83	99.2
Cobalt				100.0	92.88	92.9	98.79	98.8
Copper				50.0	52.94	105.9	53.45	106.9
Iron								
Lead	10.0	8.25	82.5	60.0	59.34	98.9	59.17	98.6
Magnesium								
Manganese				30.0	26.40	88.0	27.90	93.0
Mercury	0.4	0.46	115.0					
Nickel				80.0	76.39	95.5	71.38	89.2
Potassium								
Selenium				120.0	123.68	103.1	106.02	88.4
Silver				20.0	17.14	85.7	19.09	95.4
Sodium								
Thallium				60.0	83.07	138.4	43.29	72.2
Vanadium				100.0	94.42	94.4	97.15	97.2
Zinc				40.0	45.29	113.2	46.62	116.6

FORM II (PART 2) - IN

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-01128

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank C1278	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	P
Antimony	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Arsenic	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Calcium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Cobalt	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	18.2	B	P
Lead	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U			CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1039.1	B	P
Selenium	60.0	U	60.0	U	60.0	U	60.0	U	60.0	U	P
Silver	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Sodium	200.0	U	200.0	U	200.0	U	200.0	U	200.0	U	P
Thallium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Molybdenu	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P

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3
BLANKS

00014

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-01-28

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Molybdenu											NR

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4

ICP INTERFERENCE CHECK SAMPLE

00016

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMANAFB

Lab Code: ITSTU_____ Case No.: ITNA 44789_____ SAS No.: _____ SDG No.: MW-011289

ICP ID Number: JA1100_____ ICS Source: SPEX_____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	500000	483000	474314	483642.0	100.1	475682	474506.5	98.2
Antimony								
Arsenic								
Barium		485		473.5	97.6		500.0	103.1
Beryllium		478		473.6	99.1		461.9	96.6
Cadmium		902		893.3	99.0		893.7	99.1
Calcium	500000	493000	446737	454434.3	92.2	451992	451970.5	91.7
Chromium		463		440.4	95.1		453.0	97.8
Cobalt		416		435.8	104.8		443.0	106.5
Copper		450		412.9	91.8		432.5	96.1
Iron	200000	195000	186617	194304.7	99.6	187518	191434.9	98.2
Lead		881		933.5	106.0		949.6	107.8
Magnesium	500000	490000	480315	486985.8	99.4	486156	482353.9	98.4
Manganese		442		415.4	94.0		427.5	96.7
Mercury								
Nickel		862		854.3	99.1		825.7	95.8
Potassium								
Selenium								
Silver		927		828.1	89.3		851.5	91.9
Sodium								
Thallium								
Vanadium		443		459.6	103.7		474.9	107.2
Zinc		1000		883.3	88.3		908.4	90.8

FORM IV - IN

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MW-011289S

Lab Name: ITAS_KNOXVILLE Contract: COE-HOLLOMANAFB

Lab Code: ITSTU Case No.: 44789 (ITNA) SAS No.: _____ SDG No.: MW-011289

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR) (KK1009)	C	Sample Result (SR) (KK1007)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium	75-125	1875.4900		42.8800	B	2000.00	91.6		P
Beryllium									NR
Cadmium	75-125	40.3800		5.0000	U	50.00	80.8		P
Calcium									NR
Chromium	75-125	156.2300		10.0000	U	200.00	78.1		P
Cobalt									NR
Copper									NR
Iron	75-125	1033.1900		164.8000		1000.00	86.8		P
Lead	75-125	368.0700		30.0000	U	500.00	73.6	N	P
Magnesium									NR
Manganese	75-125	375.0700		11.0700	B	500.00	72.8	N	P
Mercury	75-125	L ~~11.1200~~		0.2000	U	1.00	~~1112.0~~ 110.0		CV
Nickel		CWK 11/21/89							NR
Potassium									NR
Selenium									NR
Silver	75-125	14.2700		5.0000	U	50.00	28.5	N	P
Sodium		200.0000	U	~~7687500~~.0000					NR
Thallium				7,690,000 .0000					NR
Vanadium				CWK 11/21/89					NR
Zinc									NR
Molybdenu									NR

Comments:
LEAD REPORTED BY GFAA.

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MW-011289 S

Lab Name: ITAS_KNOXVILLE Contract: COE-HOLLOMANAFB

Lab Code: ITSTU Case No.: 44789 ITNA SAS No.: SDG No.: MW-011289

Matrix (soil/water): WATER Level (low/med):

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	75-125	30.5600		6.4200	B	20.00	120.7		F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Molybdenu									NR

Comments:

U.S. EPA - CLP

00010

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB MW-011289 A

Lab Code: IT-STU Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-01128

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese		316.7		11.10	B	500	61.1		P
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

Comments:

6
DUPLICATES
ICAP ONLY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: Coe-Hollowman AFB MW-011289 D

Lab Code: IT-STU Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-0112

Matrix (soil/water): WATER Level (low/med): _____

% Solids for Sample: 0 % Solids for Duplicate: 0

LAB SAMPLE ID KK1007 OS LAB SAMPLE ID KK1008 D

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	difference	Q	M
Aluminum								
Antimony								
Arsenic								
Barium		42.9000	B	45.1000	B			
Beryllium								
Cadmium		5.0000	U	5.0000	U			
Calcium								
Chromium	±10ug/l	10.0000	U	22.0000		22	*	
Cobalt								
Copper								
Iron	±100ug/l	164.8000		259.0000		94.2		
Lead		30.0000	U	30.0000	U			
Magnesium								
Manganese		11.1000	B	11.4000	B			
Mercury		0.2000	U	0.2000	U			
Nickel								
Potassium								
Selenium								
Silver		5.0000	U	5.0000	U			
Sodium	±20% RPD	7687500.0000		7450000.0000		3.1		
Thallium								
Vanadium								
Zinc								
Cyanide								

U.S. EPA - CLP

00021

6
DUPLICATES

EPA SAMPLE NO.

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-HOLLOMANAFB | MW-011289 D

Lab Code: ITSTU_____ Case No.: 44789 (ITNA)_____ SAS No.: _____ SDG No.: MW-011289_

Matrix (soil/water): WATER Level (low/med): _____

% Solids for Sample: ____0 % Solids for Duplicate: ____0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum								NR
Antimony								NR
Arsenic								NR
Barium								NR
Beryllium								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								NR
Lead	825045	6.4000	B	4.0000	U			F
Magnesium								NR
Manganese								NR
Mercury								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Vanadium								NR
Zinc								NR
Molybdenu								NR

FORM VI - IN

U.S. EPA - CLP

00022

7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE_HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44789_____ SAS No.: _____ SDG No.: MW-011239

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	20000.0	21361.94	106.8						
Antimony	4000.0	4087.56	102.2						
Arsenic	4000.0	3904.68	97.6						
Barium	4000.0	4191.79	104.8						
Beryllium	4000.0	4407.39	110.2						
Cadmium	4000.0	4414.05	110.4						
Calcium	20000.0	21029.11	105.1						
Chromium	4000.0	4292.96	107.3						
Cobalt	4000.0	4116.88	102.9						
Copper	4000.0	3798.49	95.0						
Iron	20000.0	22594.60	113.0						
Lead	4000.0	4001.97	100.0						
Magnesium	20000.0	21745.57	108.7						
Manganese	4000.0	3703.79	92.6						
Mercury									
Nickel	4000.0	3981.23	99.5						
Potassium	20000.0	21573.47	107.9						
Selenium	4000.0	3981.86	99.5						
Silver	4000.0	3858.96	96.5						
Sodium	20000.0	20762.25	103.8						
Thallium	4000.0	4036.97	100.9						
Vanadium	4000.0	3943.73	98.6						
Zinc	4000.0	4095.14	102.4						
Molybdenu									

U.S. EPA - CLP

00023

7

LABORATORY CONTROL SAMPLE

GFAA & CVAA ONLY

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-011

Solid LCS Source: SPEX

Aqueous LCS Source: SPEX

Analyte	LCSW C1270 Aqueous (ug/L) True	Found	%R	LCSS Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic	40			4.0			3.2	4.8	
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20	22	110.0	2.0			1.6	2.4	
Magnesium									
Manganese									
Mercury	NR			0.20			0.16	0.24	
Nickel									
Potassium									
Selenium	20			2.0			1.6	2.4	
Silver									
Sodium									
Thallium	40			4.0			3.2	4.8	
Vanadium									
Zinc									
Cyanide									

ACCEPTANCE LIMITS: 80.0 - 120.0 %R

NR = NOT REQUIRED

U.S. EPA - CLP

00024

8

STANDARD ADDITION RESULTS

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-01128

Concentration Units: ug/L

EPA Sample No.	An	Dil	0 ADD CON	1 ADD CON	1 ADD CON	2 ADD CON	2 ADD CON	3 ADD CON	3 ADD CON	Final Conc.	r	Q

NOT APPLICABLE

STANDARD ADDITION RESULTS ARE CALCULATED USING THE SAMPLE CONCENTRATIONS AND NOT THE SAMPLE ABSORBANCES.

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

00025

EPA SAMPLE NO.

S-021289

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: 44789 ITNA SAS No.: _____ SDG No.: MW-011

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium							
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese	124		138		11.3	E	P
Mercury							
Nickel							
Potassium							
Selenium							
Silver							
Sodium	667000		724000		8.2		P
Thallium							
Vanadium							
Zinc							

U.S. EPA - CLP

10
HOLDING TIMES

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-011

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
MW-011289	WATER	12-14-89	12-18-89	4 DAYS		
MW-081289						
MW-121289						
S-021289						

U.S. EPA - CLP

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: Coe-Holloman AFB

Lab Code: ITSTU_____ Case No.: ITNA44789 SAS No.: _____ SDG No.: MW-011289

ICP ID Number: JA1100_____ Date: 4/89

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

FORM XI - IN

U.S. EPA - CLP

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE Contract: COE - HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA44789 SAS No.: _____ SDG No.: MW-011229

ICP ID Number: _____ Date: 11/89

Flame AA ID Number : _____

Furnace AA ID Number : 12E/188

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	193.7		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium					NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	283.3		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium	276.8		10	2.0	F
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE Contract: Coe-Holloman AFB

Lab Code: ITSTU Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-011289

ICP ID Number: _____ Date: 11/89

Flame AA ID Number : _____

Furnace AA ID Number : 5100/600

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	193.7		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	223.3		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.0	F
Silver			10		NR
Sodium			5000		NR
Thallium	276.8		10	2.0	F
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

00030

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE Contract: COE- HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA44789 SAS No.: SDG No.: MW-01.25

ICP ID Number: Date:

Flame AA ID Number : 151

Furnace AA ID Number :

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00031

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA44789 SAS No.: _____ SDG No.: MW-

ICP ID Number: JA1100 Date: 11/89

Analyte	Wave-length (nm)	Interelement Correction Factors for: Al	Ca	Fe	Mg	As
Aluminum	308.2					
Antimony	206.8					
Arsenic	193.6	.0088		.0013		
Barium	493.4					
Beryllium	313.0					
Cadmium	228.8					.00556
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3	.00068				
Magnesium	279.0					
Manganese	357.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0	.00027				
Silver	328.0					
Sodium	588.9					
Thallium	190.8			.00509		
Vanadium	292.4					
Zinc	213.8					

Comments:

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00032

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: IT STU Case No.: ITNA44789 SAS No.: _____ SDG No.: MW-01

ICP ID Number: JA1100 Date: 11/29

Analyte	Wave-length (nm)	Interelement Correction Factors for: Ba	Be	Cd	Co	Cr
Aluminum	308.2					
Antimony	206.8					.00558
Arsenic	193.6	.000666			.00052	
Barium	493.4					
Beryllium	313.0					.00028
Cadmium	228.8		.00433			
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3					
Magnesium	279.0					
Manganese	257.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0					
Silver	328.0			.00010286		
Sodium	588.9					
Thallium	190.8				.00183	
Vanadium	292.4					
Zinc	213.8			.00258		

Comments:

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00033

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No.: ITNA 44789 SAS No.: _____ SDG No.: HW-011

ICP ID Number: JA1100 Date: 11/89

Analyte	Wave-length (nm)	Interelement Correction Factors for: Mo	Ni	V	_	_
Aluminum	308.2			.00196		
Antimony	206.8					
Arsenic	193.6			.01282		
Barium	493.4					
Beryllium	313.0		.00012	.00623		
Cadmium	228.8					
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3					
Magnesium	279.0					
Manganese	357.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0					
Silver	328.0	.0001577		.00459		
Sodium	588.9					
Thallium	190.8			.00196		
Vanadium	292.4					
Zinc	213.8		.00326			

Comments:

U.S. EPA - CLP

13

ICP LINEAR RANGES (QUARTERLY)

00034

Lab Name: ITAS_KNOXVILLE_____ Contract: COE-HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44789 SAS No.: _____ SDG No.: MW-011289

ICP ID Number: JA1100_____ Date: 11/89

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	P
Antimony	6.00	15000.0	P
Arsenic	6.00	15000.0	P
Barium	6.00	15000.0	P
Beryllium	6.00	15000.0	P
Cadmium	6.00	15000.0	P
Calcium	6.00	500000.0	P
Chromium	6.00	15000.0	P
Cobalt	6.00	15000.0	P
Copper	6.00	40000.0	P
Iron	6.00	500000.0	P
Lead	6.00	40000.0	P
Magnesium	6.00	500000.0	P
Manganese	6.00	40000.0	P
Mercury			NR
Nickel	6.00	15000.0	P
Potassium	6.00	500000.0	P
Selenium	6.00	15000.0	P
Silver	6.00	15000.0	P
Sodium	6.00	900000.0	P
Thallium	6.00	15000.0	P
Vanadium	6.00	12000.0	P
Zinc	6.00	40000.0	P

Comments:

FORM XIII - IN

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REPORT TO: IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN: JANICE STERRETT

CLIENT: ITAS SAMPLES: 4
COMPANY: IT CORPORATION/MIDDLEBROOK
FACILITY: MIDDLEBROOK PIKE

WORK ID: WATER SAMPLES / ITNA 44789
TAKEN:
TRANS:
TYPE:
P.O. #: 486000.04
INVOICE: under separate cover

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

ATTEN: ERS
PHONE: 615-482-9707

James T. Harvey
CERTIFIED BY

CONTACT: JIM DILLARD

NOTE: AMENDED TO CORRECT TOTAL RADIUM.
CC: MIDDLEBROOK LAB

SAMPLE IDENTIFICATION	
01	KK1029
02	KK1030
03	KK1031
04	KK1032

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETAW	GROSS BETA
RA226	RA-226
RA228	RA-228
SPEC	SPECIAL FORM FOR REPORTING

RECEIVED
FEB 20 1990
IT CORP.-ALBUQUERQUE

Received: 12/15/89

ITRSL Oak Ridge REPORT Work Order # R9-12-077
Results by Sample

SAMPLE ID KK1029 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/13/89 Category 145634

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<700		pCi/l
GROSS BETA	<715		pCi/l
TOTAL RADIUM	2.18	0.38	pCi/l

SAMPLE ID KK1030 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/13/89 Category 145634

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	122	83	pCi/l
GROSS BETA	105	60	pCi/l
TOTAL RADIUM	1.14	0.29	pCi/l

Received: 12/15/89

ITRSL Oak Ridge REPORT Work Order # R9-12-077
Results by Sample

SAMPLE ID KK1031 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/13/89 Category 145634

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	250	220	pCi/l
GROSS BETA	<480		pCi/l
TOTAL RADIUM	2.31	0.41	pCi/l

SAMPLE ID KK1032 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/13/89 Category 145634

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	134	60	pCi/l
GROSS BETA	<560		pCi/l
TOTAL RADIUM	1.15	0.26	pCi/l

Received. 12/15/89

ITRSL Oak Ridge REPORT
02/06/90 10:22:40

Work Order # R9-12-077

REPORT TO
IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN JANICE STERRETT

PREPARED BY
IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY

ATTEN ERS
PHONE 615-482-9707

CONTACT JIM DILLARD

CLIENT ITAS SAMPLES 4
COMPANY IT CORPORATION/MIDDLEBROOK
FACILITY MIDDLEBROOK PIKE

WORK ID WATER SAMPLES / ITNA 44789
TAKEN
TRANS
TYPE
P.O. # 486000.04
INVOICE under separate cover

SAMPLE IDENTIFICATION	
01	KK1029
02	KK1030
03	KK1031
04	KK1032

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETAW	GROSS BETA
RA226	RA-226
RA228	RA-228
SPEC	SPECIAL FORM FOR REPORTING

Received: 12/15/89

ITRSL Oak Ridge REPORT
Results by Sample

Work Order # R9-12-077

SAMPLE ID KK1029 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/13/89 Category 145634

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<700		pCi/l
GROSS BETA	<715		pCi/l
RA-226	2.18	0.38	pCi/l
RA-228	1.07	0.42	pCi/l

SAMPLE ID KK1030 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/13/89 Category 145634

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	122	83	pCi/l
GROSS BETA	105	60	pCi/l
RA-226	1.14	0.29	pCi/l
RA-228	<1.19		pCi/l

Received: 12/15/89

ITRSL Oak Ridge REPORT Work Order # R9-12-077
Results by Sample

SAMPLE ID KK1031 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/13/89 Category 145634

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	250	220	pCi/l
GROSS BETA	<480		pCi/l
RA-226	2.31	0.41	pCi/l
RA-228	1.95	0.55	pCi/l

SAMPLE ID KK1032 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/13/89 Category 145634

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	134	60	pCi/l
GROSS BETA	<560		pCi/l
RA-226	1.15	0.26	pCi/l
RA-228	1.58	0.58	pCi/l

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

January 4, 1990

Job Number: ITNA 44778

P.O. Number: 301251.02.04

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	12/13/89
Number of Samples:	Seven (7)
Sample Type:	Water

I. Introduction

On 12/13/89, seven (7) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for the requested radiological parameters at the IT-Radiological Services Laboratory (IT-RSL) in Oak Ridge, Tennessee. A separate laboratory report will follow.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA SW-846 methods 8080 and 8150.

The samples were analyzed for total organic carbon (TOC) by chemical wet oxidation/infrared detection based on EPA SW-846 method 9060.

Reviewed and Approved:

Alyce Moore
Laboratory Manager

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II. Analytical Results/Methodology (continued)

The samples were analyzed for phenols by colorimetric determination using EPA SW-846 method 9065.

The samples were analyzed for nitrate and nitrite by colorimetric determination using EPA method 353.3.

The samples were analyzed for requested anions by ion chromatography using EPA method 300.0.

The samples were analyzed for fluoride by potentiometric determination using EPA method 340.2.

III. Quality Control

Routine laboratory level I QC was followed.

The samples were extracted for pesticides and herbicides on 12/14/89 and 12/15/89. The samples were analyzed from 12/21/89 through 12/28/89. No problems were encountered.

The samples were analyzed for TOC on 12/22/89. No problems were encountered.

The phenol analyses were performed on 01/02/90. No problems were encountered.

The nitrate and nitrite analyses were performed on 12/29/89. No problems were encountered.

The anion analyses were performed on 01/02/90. No problems were encountered.

The fluoride determination was performed on 12/20/89. No problems were encountered.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44778

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	Method Blank	MW-021289
Lab Sample ID:	BLA0224/A0236	KK0945
Lindane	0.1 U	0.1 U
Endrin	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U
Silvex	0.1 U	0.1 U
Date Extracted:	12/15/89	12/14/89
Date Analyzed:	12/26/89	12/26/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44778

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	MW-031289	MW-041289	MW-051289
Lab Sample ID:	KK0946	KK0947	KK0948
Lindane	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U
Date Extracted:	12/14/89	12/14/89	12/14/89
Date Analyzed:	12/26/89	12/26/89	12/28/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44778

PESTICIDES AND HERBICIDES ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID:	MW-061289	MW-071289	S-041289
Lab Sample ID:	KK0949	KK0950	KK0951
Lindane	0.1 U	0.1 U	0.1 U
Endrin	0.1 U	0.1 U	0.1 U
Methoxychlor	0.1 U	0.1 U	0.1 U
Toxaphene	0.5 U	0.5 U	0.5 U
2,4-D	1.2 U	1.2 U	1.2 U
Silvex	0.1 U	0.1 U	0.1 U
Date Extracted:	12/14/89	12/14/89	12/14/89
Date Analyzed:	12/28/89	12/28/89	12/28/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44778

TOTAL ORGANIC CARBON ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
MW-021289	KK0938	4
MW-031289	KK0939	8
MW-041289	KK0940	5
MW-051289	KK0941	5
MW-061289	KK0942	4
MW-071289	KK0943	4
S-041289	KK0944	2
Method Blank	D0339	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 12/22/89

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44778

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Chloride	Sulfate	Fluoride
Method Blank	P0775/P0749	0.5 U	1.5 U	0.1 U
MW-021289	KK0917	1,300	2,800	1.3
MW-031289	KK0918	3,400	2,800	1.4
MW-041289	KK0919	3,200	2,400	0.9
MW-051289	KK0920	4,900	1,400	2.0
MW-061289	KK0921	55,000	5,600	1.0
MW-071289	KK0922	1,000	1,900	2.3
S-041289	KK0923	49,000	9,200	1.0
Date Analyzed:		01/02/90	01/02/90	12/20/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44778

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Nitrate, as N	Nitrite, as N
Method Blank	P0769/P0771	0.05 U	0.01 U
MW-021289	KK0910	0.06	0.01 U
MW-031289	KK0911	0.07	0.01 U
MW-041289	KK0912	0.06	0.01 U
MW-051289	KK0913	0.05 U	0.01 U
MW-061289	KK0914	1.7	0.06
MW-071289	KK0915	0.07	0.01 U
S-041289	KK0916	27	0.01 U
Date Analyzed:		12/29/89	12/29/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 4, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44778

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Phenols
Method Blank	P0777	0.01 U
MW-021289	KK0924	0.01 U
MW-031289	KK0925	0.01 U
MW-041289	KK0926	0.01 U
MW-051289	KK0927	0.01 U
MW-061289	KK0928	0.01 U
MW-071289	KK0929	0.01 U
S-041289	KK0930	0.01 U
Date Analyzed:		01/02/90

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

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ANALYTICAL SERVICES

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CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer DM 1/2/90

December 22, 1989

Job Number: ITNA 44778

P.O. Number: 301251.02.04

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	12/13/89
Number of Samples:	Seven (7)
Sample Type:	Water

I. Introduction

On 12/13/89, seven (7) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all CLP data are not blank corrected.

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

The arsenic and selenium analyses were cancelled by the client on 12/18/89.

Reviewed and Approved:

Mary Tyler

Mary Tyler
Laboratory Project Manager

III. Quality Control

The samples were digested on 12/19/89 for ICP and 12/18/89 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 12/18/89; the GFAA analysis for lead was performed on 12/18/89; the remaining metals were analyzed by ICP on 12/20/89. All run QC was acceptable. Associated QC samples were analyzed with ITAS project ITNA 44789, sample MW-011289.

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

00001

Lab Name: ITAS_KNOXVILLE_____ Contract: HOLLOMAN AFB COE

Lab Code: ITSTU_____ Case No.: 44778 ITNA_____ SAS No.: _____ SDG No.: MW-021289_

SOW No.: 7/87_

EPA Sample No.	Lab Sample ID.
MW-021289	KK0931
MW-031289	KK0932
MW-041289	KK0933
MW-051289	KK0934
MW-061289	KK0935
MW-071289	KK0936
S-041289	KK0937

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Lab Manager: _____

Date: _____

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply
X - Detection limits higher than normal due to sample matrix interferences.

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-021289

Lab Name: ITAS_KNOXVILLE Contract: COE - HOLLOMAN AFB

Lab Code: ITSTU Case No.: 44778 ITNA SAS No.: SDG No.: MW-021289

Matrix (soil/water): WATER Lab Sample ID: KK0931

Level (low/med): Date Received: 12/13/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	24.3	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	345			P
7439-92-1	Lead	5.0	B		F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	817		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	548000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

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Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-031289

Lab Name: ITAS_KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA 44778 SAS No.: SDG No.: MW-021289

Matrix (soil/water): WATER Lab Sample ID: KK0932

Level (low/med): Date Received: 12/13/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	13.3	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	431			P
7439-92-1	Lead	3.8	B	W	F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	1370		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	2470000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

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Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-041289

Lab Name: ITAS_KNOXVILLE Contract: COE HOLLOMAN -AFB

Lab Code: ITSTU Case No.: ITNA 44778 SAS No.: SDG No.: MW-021289

Matrix (soil/water): WATER Lab Sample ID: KK0933

Level (low/med): Date Received: 12/13/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	15.5	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	25.6			P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	344			P
7439-92-1	Lead	5.6	B		F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	446		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	1,640,000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-051289

Lab Name: ITAS_KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA 44778 SAS No.: SDG No.: MW-021289

Matrix (soil/water): WATER Lab Sample ID: KK0934

Level (low/med): Date Received: 12/13/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	42.0	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	434			P
7439-92-1	Lead	5.3			F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	2030		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	1,330,000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

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Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-061289

Lab Name: ITAS_KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA 44778 SAS No.: SDG No.: MW-021289

Matrix (soil/water): WATER Lab Sample ID: KK0935

Level (low/med): Date Received: 12/13/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	35.8	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	59.6	B		P
7439-92-1	Lead	12.0	U		F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	608		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	15,300,000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

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Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

MW-071289

Lab Name: ITAS_KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA 44778 SAS No.: SDG No.: MW-021289

Matrix (soil/water): WATER Lab Sample ID: KK0936

Level (low/med): Date Received: 12/13/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	20.8	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	55.6	B		P
7439-92-1	Lead	13.6			F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	684		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	513000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

Color Before: Colorless Clarity Before: Clear Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

S-041289

Lab Name: ITAS_KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: ITSTU Case No.: 44778 ITNA SAS No.: SDG No.: MW-021289

Matrix (soil/water): WATER Lab Sample ID: KK0937

Level (low/med): Date Received: 12/13/89

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony				NR
7440-38-2	Arsenic				NR
7440-39-3	Barium	29.6	B		P
7440-41-7	Beryllium				NR
7440-43-9	Cadmium	5.0	U		P
7440-70-2	Calcium				NR
7440-47-3	Chromium	10	U		P
7440-48-4	Cobalt				NR
7440-50-8	Copper				NR
7439-89-6	Iron	1230			P
7439-92-1	Lead	10.4	B		F
7439-95-4	Magnesium				NR
7439-96-5	Manganese	38.4		E	P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel				NR
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver	5.0	U		P
7440-23-5	Sodium	9,710,000		E	P
7440-28-0	Thallium				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc				NR
	Molybdenu				NR

Color Before: Colorless Clarity Before: Cloudy Texture:

Color After: Colorless Clarity After: Clear Artifacts:

Comments:

FORM I - IN

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE- HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44778_____ SAS No.: _____ SDG No.: MW-021289_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40000.0	39977.2	99.9	40000.0	40648.36	101.6	39747.87	99.4	P
Antimony	4000.0	3974.27	99.4	4000.0	4001.89	100.0	3814.71	95.4	P
Arsenic	4000.0	3653.17	91.3	4000.0	3675.61	91.9	3838.96	96.0	P
Barium	4000.0	3909.71	97.7	4000.0	3991.51	99.8	4200.19	105.0	P
Beryllium	4000.0	4120.52	103.0	4000.0	4185.62	104.6	4066.20	101.7	P
Cadmium	4000.0	4116.60	102.9	4000.0	4092.25	102.3	4241.27	106.0	P
Calcium	40000.0	39060.5	97.7	40000.0	38949.67	97.4	38974.35	97.4	P
Chromium	4000.0	3863.27	96.6	4000.0	3889.72	97.2	4021.98	100.5	P
Cobalt	4000.0	4027.28	100.7	4000.0	4039.61	101.0	4256.28	106.4	P
Copper	4000.0	3860.60	96.5	4000.0	3904.13	97.6	4192.80	104.8	P
Iron	40000.0	43414.9	108.5	40000.0	43792.40	109.5	43316.85	108.3	P
Lead	4000.0	3795.32	94.9	4000.0	3796.93	94.9	3943.82	98.6	P
Magnesium	40000.0	41554.1	103.9	40000.0	41793.56	104.5	41415.05	103.5	P
Manganese	4000.0	3878.47	97.0	4000.0	3912.67	97.8	4116.07	102.9	P
Mercury	4.0	4.07	101.8	4.0	4.02	100.5	4.07	101.8	CV
Nickel	4000.0	4125.10	103.1	4000.0	4133.44	103.3	4100.41	102.5	P
Potassium	40000.0	41712.0	104.3	40000.0	40969.81	102.4	39905.20	99.8	P
Selenium	4000.0	4007.46	100.2	4000.0	3918.35	98.0	4212.31	105.3	P
Silver	4000.0	3867.29	96.7	4000.0	3872.24	96.8	4127.24	103.2	P
Sodium	40000.0	37755.4	94.4	40000.0	38267.50	95.7	37163.60	92.9	P
Thallium	4000.0	3937.63	98.4	4000.0	3929.06	98.2	4215.37	105.4	P
Vanadium	4000.0	3823.94	95.6	4000.0	3850.86	96.3	4069.37	101.7	P
Zinc	4000.0	3839.46	96.0	4000.0	3840.80	96.0	3964.21	99.1	P
Molybdenu	4000.0	4230.14	105.8	4000.0	4234.37	105.9	4222.91	105.6	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: HOLLOMAN AFB (CDE-)

Lab Code: ITSTU_____ Case No.: 44778 (ITNA)_____ SAS No.: _____ SDG No.: MW-021289_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				40000.0	40019.61	100.0			P
Antimony				4000.0	3777.94	94.4			P
Arsenic				4000.0	3898.88	97.5			P
Barium				4000.0	4201.52	105.0			P
Beryllium				4000.0	4046.36	101.2			P
Cadmium				4000.0	4246.72	106.2			P
Calcium				40000.0	39162.14	97.9			P
Chromium				4000.0	4015.37	100.4			P
Cobalt				4000.0	4180.99	104.5			P
Copper				4000.0	4057.37	101.4			P
Iron				40000.0	43428.23	108.6			P
Lead				4000.0	3891.01	97.3			P
Magnesium				40000.0	41883.37	104.7			P
Manganese				4000.0	4040.70	101.0			P
Mercury				4.0	3.97	99.2			CV
Nickel				4000.0	4002.52	100.1			P
Potassium				40000.0	41338.95	103.3			P
Selenium				4000.0	4136.27	103.4			P
Silver				4000.0	4010.01	100.3			P
Sodium				40000.0	37677.84	94.2			P
Thallium				4000.0	4099.76	102.5			P
Vanadium				4000.0	3978.85	99.5			P
Zinc				4000.0	3993.65	99.8			P
Molybdenu				4000.0	4189.02	104.7			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

00012

Lab Name: ITAS_KNOXVILLE_____ Contract: CDE - HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44778_____ SAS No.: _____ SDG No.: MW-021289_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead	50.0	48.38	96.8	50.0	54.15	108.3	54.80	109.6	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Molybdenu									NR

(1) Control Limits: **Mercury** 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE- HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44778_____ SAS No.: _____ SDG No.: MW-021289_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	54.41	108.8	53.06	106.1	F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Molybdenu									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

FORM II (PART 1) - IN

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_KNOXVILLE_____ Contract: COE- HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44778_____ SAS No.: _____ SDG No.: MW-021239_

Initial Calibration Source: NBS_____

Continuing Calibration Source: NBS_____

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic									NR
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	54.79	109.6			F
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Thallium									NR
Vanadium									NR
Zinc									NR
Molybdenu									NR

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_KNOXVILLE_____ Contract: COE- HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA 44778_____ SAS No.: _____ SDG No.: MW-021289_

AA CRDL Standard Source: NBS_____

ICP CRDL Standard Source: NBS_____

Concentration Units: ug/L

Analyte	CRDL Standard for AA True	Found	%R	CRDL Standard for ICP True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony				120.0	97.07	80.9	93.00	77.5
Arsenic				60.0	65.02	108.4	59.04	98.4
Barium								
Beryllium				10.0	10.30	103.0	9.99	99.9
Cadmium				10.0	10.92	109.2	10.12	101.2
Calcium								
Chromium				20.0	18.68	93.4	19.83	99.2
Cobalt				100.0	92.88	92.9	98.79	98.8
Copper				50.0	52.94	105.9	53.45	106.9
Iron								
Lead	10.0	8.25	82.5	60.0	59.34	98.9	59.17	98.6
Magnesium								
Manganese				30.0	26.40	88.0	27.90	93.0
Mercury	0.4	0.46	115.0					
Nickel				80.0	76.39	95.5	71.38	89.2
Potassium								
Selenium				120.0	123.68	103.1	106.02	88.4
Silver				20.0	17.14	85.7	19.09	95.4
Sodium								
Thallium				60.0	83.07	138.4	43.29	72.2
Vanadium				100.0	94.42	94.4	97.15	97.2
Zinc				40.0	45.29	113.2	46.62	116.6

3
BLANKS

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - HOLLOMAN AFB

Lab Code: ITSTU_ Case No.: ITNA 44778 SAS No.: _____ SDG No.: MW-02128

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	40.0	U	40.0	U	40.0	U	40.0	U	40.0	U	P
Antimony	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Arsenic	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Barium	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	P
Cadmium	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Calcium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Chromium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Cobalt	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Copper	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Iron	10.0	U	10.0	U	10.0	U	10.0	U	18.2	B	P
Lead	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Magnesium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Manganese	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	P
Mercury	0.2	U	0.2	U	0.2	U	0.2	U			CV
Nickel	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U	P
Potassium	1000.0	U	1000.0	U	1000.0	U	1000.0	U	1039.1	B	P
Selenium	60.0	U	60.0	U	60.0	U	60.0	U	60.0	U	P
Silver	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Sodium	200.0	U	200.0	U	200.0	U	200.0	U	200.0	U	P
Thallium	30.0	U	30.0	U	30.0	U	30.0	U	30.0	U	P
Vanadium	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P
Zinc	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	P
Molybdenu	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	P

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3
BLANKS

00017

Lab Name: ITAS_KNOXVILLE_____ Contract: COE- HOLLOMAN_AFB

Lab Code: ITSTU_ Case No.: TNA 44778 SAS No.: _____ SDG No.: MW-021289

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Molybdenu											NR

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3
BLANKS

00018

Lab Name: ITAS_KNOXVILLE_____ Contract: COE HOLLOMAN_-AFB

Lab Code: ITSTU_ Case No.: ITNA 44778 SAS No.: _____ SDG No.: MW-02128

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/l

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic											NR
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.0	U	2.0	U					F
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium											NR
Silver											NR
Sodium											NR
Thallium											NR
Vanadium											NR
Zinc											NR
Molybdenu											NR

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00019

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: CDE- HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: MNA 44778_____ SAS No.: _____ SDG No.: MW-021289_

ICP ID Number: JA1100_____ ICS Source: SPEX_____

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	500000	483000	474314	483642.0	100.1	475682	474506.5	98.2
Antimony								
Arsenic								
Barium		485		473.5	97.6		500.0	103.1
Beryllium		478		473.6	99.1		461.9	96.6
Cadmium		902		893.3	99.0		893.7	99.1
Calcium	500000	493000	446737	454434.3	92.2	451992	451970.5	91.7
Chromium		463		440.4	95.1		453.0	97.8
Cobalt		416		435.8	104.8		443.0	106.5
Copper		450		412.9	91.8		432.5	96.1
Iron	200000	195000	186617	194304.7	99.6	187518	191434.9	98.2
Lead		881		933.5	106.0		949.6	107.8
Magnesium	500000	490000	480315	486985.8	99.4	486156	482353.9	98.4
Manganese		442		415.4	94.0		427.5	96.7
Mercury								
Nickel		862		854.3	99.1		825.7	95.8
Potassium								
Selenium								
Silver		927		828.1	89.3		851.5	91.9
Sodium								
Thallium								
Vanadium		443		459.6	103.7		474.9	107.2
Zinc		1000		883.3	88.3		908.4	90.8

FORM IV - IN

U.S. EPA - CLP

00020

7

LABORATORY CONTROL SAMPLE

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - HOLLOMAN_AFB

Lab Code: ITSTU_____ Case No.: ITNA 44778_____ SAS No.: _____ SDG No.: MW-021289_

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	20000.0	21361.94	106.8						
Antimony	4000.0	4087.56	102.2						
Arsenic	4000.0	3904.68	97.6						
Barium	4000.0	4191.79	104.8						
Beryllium	4000.0	4407.39	110.2						
Cadmium	4000.0	4414.05	110.4						
Calcium	20000.0	21029.11	105.1						
Chromium	4000.0	4292.96	107.3						
Cobalt	4000.0	4116.88	102.9						
Copper	4000.0	3798.49	95.0						
Iron	20000.0	22594.60	113.0						
Lead	4000.0	4001.97	100.0						
Magnesium	20000.0	21745.57	108.7						
Manganese	4000.0	3703.79	92.6						
Mercury									
Nickel	4000.0	3981.23	99.5						
Potassium	20000.0	21573.47	107.9						
Selenium	4000.0	3981.86	99.5						
Silver	4000.0	3858.96	96.5						
Sodium	20000.0	20762.25	103.8						
Thallium	4000.0	4036.97	100.9						
Vanadium	4000.0	3943.73	98.6						
Zinc	4000.0	4095.14	102.4						
Molybdenu									

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7

LABORATORY CONTROL SAMPLE

00021

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: 44778 ITNA_____ SAS No.: _____ SDG No.: MW-021289_

Solid LCS Source: _____

Aqueous LCS Source: SPEX_____

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead	20	22.20	111.0						
Magnesium									
Manganese									
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Molybdenu									

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8

STANDARD ADDITION RESULTS

00022

Lab Name: ITAS-KNOXVILLE Contract: CDE - Holloman AFB

Lab Code: IT-STU Case No.: ITNA44178 SAS No.: _____ SDG No.: MW-0212

Concentration Units: ug/L

EPA Sample No.	An	Dil	0 ADD CON	1 ADD CON	1 ADD CON	2 ADD CON	2 ADD CON	3 ADD CON	3 ADD CON	Final Conc.	r	Q
NOT APPLICABLE												

STANDARD ADDITION RESULTS ARE CALCULATED USING THE SAMPLE CONCENTRATIONS AND NOT THE SAMPLE ABSORBANCES.

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

MW-021289

Lab Name: ITAS-KNOXVILLE Contract: COE-Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44778 SAS No.: _____ SDG No.: MW-026

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

00023

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium							
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese	817.0		978.5		19.8	E	P
Mercury							
Nickel							
Potassium							
Selenium							
Silver							
Sodium	547614.90		643901.20		17.6	E	P
Thallium							
Vanadium							
Zinc							

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10
HOLDING TIMES

00024

Lab Name: ITAS-KNOXVILLE Contract: COE-Holloman-AFB

Lab Code: IT-STU Case No.: ITNA 44778 SAS No.: _____ SDG No.: MW-02

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time
MW-021289	water	12/13/89	12/18/89	5 days		
MW-031289	water	12/13/89	12/18/89	5 days		
MW-041289	water	12/13/89	12/18/89	5 days		
MW-051289	water	12/13/89	12/18/89	5 days		
MW-061289	water	12/13/89	12/18/89	5 days		
MW-071289	water	12/13/89	12/18/89	5 days		
S-041289	water	12/13/89	12/18/89	5 days		

U.S. EPA - CLP

INSTRUMENT DETECTION[11] LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - Holloman AFB

Lab Code: ITSTU_____ Case No.: ITNA44778 SAS No.: _____ SDG No.: MW-021289

ICP ID Number: JA1100_____ Date: 11/89

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

FORM XI - IN

U.S. EPA - CLP

00026

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE- Holloman AFB

Lab Code: ITSTU_____ Case No.: ITNA44778 SAS No.: _____ SDG No.: MW-021289

ICP ID Number: _____ Date: 11/89

Flame AA ID Number : _____

Furnace AA ID Number : 12E/188_____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	193.7		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	283.3		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium	276.8		10	2.0	F
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

00027

INSTRUMENT DETECTION[11] LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - Holloman AFB

Lab Code: ITSTU_____ Case No.: ITNA44778 SAS No.: _____ SDG No.: MW-021289

ICP ID Number: _____ Date: 11/89

Flame AA ID Number : _____

Furnace AA ID Number : 5100/600____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	193.7		10	2.0	F
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	283.3		5	2.0	F
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.0	F
Silver			10		NR
Sodium			5000		NR
Thallium	276.8		10	2.0	F
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

INSTRUMENT DETECTION[11] LIMITS (QUARTERLY)

00028

Lab Name: ITAS_KNOXVILLE_____ Contract: COE - Hollomen AFB

Lab Code: ITSTU_____ Case No.: ITNA44778 SAS No.: _____ SDG No.: MW-021289

ICP ID Number: _____ Date: 11/89

Flame AA ID Number : 151_____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			5		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

FORM XI - IN

U.S. EPA - CLP

12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00029

Lab Name: ITAS-KNOXVILLE Contract: CDE - Holloman AFB

Lab Code: IT STU Case No.: ITNA44778 SAS No.: _____ SDG No.: MW-06

ICP ID Number: JA1100 Date: 11/89

Analyte	Wave-length (nm)	Interelement Correction Factors for: Al	Ca	Fe	Mg	As
Aluminum	308.2					
Antimony	206.8					
Arsenic	193.6	.0088		.0013		
Barium	493.4					
Beryllium	313.0					
Cadmium	228.8					.005516
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3	.00068				
Magnesium	279.0					
Manganese	357.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0	.00027				
Silver	328.0					
Sodium	588.9					
Thallium	190.8			.00509		
Vanadium	292.4					
Zinc	213.8					

Comments:

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00030

Lab Name: ITAS-KNOXVILLE Contract: COE - Holloman AFB

Lab Code: IT STU Case No.: ITNA44778 SAS No.: _____ SDG No.: MW-02

ICP ID Number: JA1100 Date: 11/29

Analyte	Wave-length (nm)	Interelement Correction Factors for: Ba	Be	Cd	Co	Cr
Aluminum	308.2					
Antimony	206.8					.00552
Arsenic	193.6	.000666			.00052	
Barium	493.4					
Beryllium	313.0					.00028
Cadmium	228.8		.00433			
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3					
Magnesium	279.0					
Manganese	257.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0					
Silver	328.0			.0001086		
Sodium	588.9					
Thallium	190.8				.00183	
Vanadium	292.4					
Zinc	213.8			.00258		

Comments:

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00031

Lab Name: ITAS-KNOXVILLE Contract: CDE - Holloman AFB

Lab Code: IT STU Case No.: ITNA44778 SAS No.: _____ SDG No.: MW-02

ICP ID Number: JA100 Date: 11/89

Analyte	Wave-length (nm)	Interelement Correction Factors for: Mo	Ni	V	—	—
Aluminum	308.2			.00196		
Antimony	206.8					
Arsenic	193.6			.01222		
Barium	493.4					
Beryllium	313.0		.00012	.00623		
Cadmium	228.8					
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3					
Magnesium	279.0					
Manganese	357.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0					
Silver	328.0	.0001577		.00459		
Sodium	588.9					
Thallium	190.8			.00196		
Vanadium	292.4					
Zinc	213.8		.00326			

Comments:

U.S. EPA - CLP

13

ICP LINEAR RANGES (QUARTERLY)

00032

Lab Name: ITAS_KNOXVILLE_____ Contract: CDE - Holloman AFB

Lab Code: ITSTU_____ Case No.: ITNA44778 SAS No.: _____ SDG No.: MW-021289

ICP ID Number: JA1100_____ Date: 11/89

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	P
Antimony	6.00	15000.0	P
Arsenic	6.00	15000.0	P
Barium	6.00	15000.0	P
Beryllium	6.00	15000.0	P
Cadmium	6.00	15000.0	P
Calcium	6.00	500000.0	P
Chromium	6.00	15000.0	P
Cobalt	6.00	15000.0	P
Copper	6.00	40000.0	P
Iron	6.00	500000.0	P
Lead	6.00	40000.0	P
Magnesium	6.00	500000.0	P
Manganese	6.00	40000.0	P
Mercury			NR
Nickel	6.00	15000.0	P
Potassium	6.00	500000.0	P
Selenium	6.00	15000.0	P
Silver	6.00	15000.0	P
Sodium	6.00	900000.0	P
Thallium	6.00	15000.0	P
Vanadium	6.00	12000.0	P
Zinc	6.00	40000.0	P

Comments:

FORM XIII - IN

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Received: 12/14/89

ITRSL Oak Ridge REPORT
02/15/90 15:45.22

Work Order # R9-12-063

REPORT TO: IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN: JANICE STERRETT

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

CERTIFIED BY: James T. Harvey

ATTEN: ERS
PHONE: 615-482-9707

CONTACT: JIM DILLARD

CLIENT: ITAS SAMPLES: 7
COMPANY: IT CORPORATION/MIDDLEBROOK
FACILITY: MIDDLEBROOK PIKE

ORIGINAL REPORT MAILED TO MARK LYON OF ALBUQUERQUE;
COPY TO MIDDLEBROOK.

WORK ID: WATER SAMPLES / ITNA 44778
TAKEN:
TRANS:
TYPE:
P.O. #: 486000.04
INVOICE: under separate cover

	SAMPLE IDENTIFICATION
01	KK0952 (MW-021289)
02	KK0953 (MW-031289)
03	KK0954 (MW-041289)
04	KK0955 (MW-051289)
05	KK0956 (MW-061289)
06	KK0957 (MW-071289)
07	KK0958 (S-041289)

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETA	GROSS BETA
RA226	RA-226
RA228	RA-228
SPEC	SPECIAL FORM FOR REPORTING

RECEIVED
FEB 20 1990
IT CORP.-ALBUQUERQUE

SAMPLE ID KK0952 (MW-021289) FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/12/89 Category 145620

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<40		pCi/l
GROSS BETA	<40		pCi/l
PREPARED ON:	1/11/90		
COUNTED ON:	1/24/90		
TOTAL RADIUM	<5.0		pCi/l
PREPARED ON:	12/20/89		
ANALYZED ON:	12/20/89		

SAMPLE ID KK0953 (MW-031289) FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/12/89 Category 145620

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<125		pCi/l
GROSS BETA	<110		pCi/l
PREPARED ON:	1/11/90		
COUNTED ON:	1/24/90		
TOTAL RADIUM	<5.0		pCi/l
PREPARED ON:	12/20/89		
ANALYZED ON:	12/20/89		

SAMPLE ID KK0954 (MW-041289) FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/11/89 Category 145620

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<250		pCi/l
GROSS BETA	100	60	pCi/l
PREPARED ON:	1/11/90		
COUNTED ON:	1/24/90		
TOTAL RADIUM	<5.0		pCi/l
PREPARED ON:	12/20/89		
ANALYZED ON:	12/20/89		

SAMPLE ID KK0955 (MW-051289) FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/12/89 Category 145620

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<85		pCi/l
GROSS BETA	<86		pCi/l
PREPARED ON:	1/11/90		
COUNTED ON:	1/24/90		
TOTAL RADIUM	<5.0		pCi/l
PREPARED ON:	12/20/89		
ANALYZED ON:	12/20/89		

SAMPLE ID KK0956 (MW-061289) FRACTION 05A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/11/89 Category 145620

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<9		pCi/l
GROSS BETA	<1		pCi/l
PREPARED ON:	1/31/90		
COUNTED ON:	2/01/90		
TOTAL RADIUM	7.58	0.12	pCi/l
PREPARED ON:	12/20/89		
ANALYZED ON:	12/20/89		

SAMPLE ID KK0957 (MW-071289) FRACTION 06A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/12/89 Category 145620

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	70	36	pCi/l
GROSS BETA	<40		pCi/l
PREPARED ON:	1/11/90		
COUNTED ON:	1/24/90		
TOTAL RADIUM	<5.0		pCi/l
PREPARED ON:	12/20/89		
ANALYZED ON:	12/20/89		

Received 12/14/89

ITRSL Oak Ridge REPORT Work Order # R9-12-063
Results by Sample

SAMPLE ID KK0958 (S-041289) FRACTION 07A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 12/11/89 Category 145620

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	545	344	pCi/l
GROSS BETA	<217		pCi/l
PREPARED ON:	1/11/90		
COUNTED ON:	1/24/90		
TOTAL RADIUM	<5.0		pCi/l
PREPARED ON:	12/20/89		
ANALYZED ON:	12/20/89		

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
5301 Central Avenue NE
Suite 700
Albuquerque, New Mexico 87108
Attn: Mr. Dann Meyer Dee 1/26/90 301215.02.04

Date: January 19, 1990

Job Number PN 3003-375

This is the Certificate of Analysis for the following samples:

Client Project ID:	Holloman AFB Project
Date Received by Lab:	December 13, 1989
Work Order:	T9-12-110
Number of Samples:	8
Sample Type:	Water

I. Introduction

Eight water samples were received at the ITAS Cincinnati laboratory on December 13, 1989. The samples were labeled as follows:

MW-021289	MW-061289
MW-031289	MW-071289
MW-041289	S-041289
MW-051289	MW-111289

II. Analytical Results/Methodology

The samples were analyzed for purgeable organic halogens (POX) by EPA Method 9021. All the samples except MW-111289 were also digested for metals analysis by EPA Method 206.5 and analyzed for arsenic by EPA Method 206.3 and selenium by EPA Method 270.3.

It must be noted that the holding time for POX was exceeded by 6 days at the time of analysis.

III. Quality Control

It was requested that one sample be spiked for each metal and POX. The results of these analyses are presented with the analytical results.

Reviewed and Approved by:

Ken Mueller

Ken Mueller
Inorganic Lab Group Supervisor
T912110

RECEIVED
JAN 25 1990
IT CORP.-ALBUQUERQUE

Client: Holloman AFB Project
Work Order: T9-12-110
T912110A

IT ANALYTICAL SERVICES
CINCINNATI, OH

Analyte	Units	MW-021289 01	MW-031289 02	MW-041289 03	MW-051289 04	Detection Limit
POX	ug/L	ND	ND	ND	ND	5.0
Arsenic	ug/L	4.9	3.2	3.6	5.2	0.3
Selenium	ug/L	ND	ND	ND	ND	0.3

Analyte	Units	MW-061289 05	MW-071289 06	S-041289 07	MW-111289 08	Detection Limit
POX	ug/L	ND	ND	ND	ND	5.0
Arsenic	ug/L	2.8	17.5	5.1	NR	0.3
Selenium	ug/L	1.8	0.3	6.4	NR	0.3

ND = Not Detected
NR = Not Requested

Quality Control
MS/MSD Results

Analyte	Sample ID	Spike Added, ug	MS % Rec.	MSD % Rec.
POX	S-041289	25	99.6	100.2
Arsenic	MW-061289	0.050	71.2	83.6
Selenium	MW-061289	0.050	74.0	78.8

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED
FEB 16 1990
IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

IT Corporation
5301 Central Avenue NE
Suite 700
Albuquerque, New Mexico 87108
Attn: Mr. Dann Meyer

Date: February 15, 1990

Job Number PN 3003-375

P.O. Number: 90-090

This is the Certificate of Analysis for the following samples:

Client Project ID:	Holloman AFB
Date Received by Lab:	December 14, 1989, January 17 and January 18, 1990
Work Order:	T9-12-123, X0-01-181 and X0-01-192
Number of Samples:	16
Sample Type:	Water

I. Introduction

Sixteen water samples arrived at ITAS Cincinnati from December 14, 1989 to January 18, 1990. The samples were sent for analytical work in support of monitoring work at the Holloman AFB. The samples were labeled as follows:

Water # MW-011289	Water # MW-060190	Water # MW-080190
Water # MW-121289	Water # MW-040190	Water # S -020190
Water # MW-081289	Water # S -040190	Water # MW-010190
Water # S-021289	Water # MW-110190	Water # MW-120190
	Water # MW-030190	Water # MW-050190
	Water # MW-020190	Water # MW-070190

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits. The analyses requested include purgeable organic halides by EPA SW846 Method 9021; arsenic by gaseous hydride atomic absorption using EPA SW846 Method 7061; and selenium by gaseous hydride atomic absorption using EPA SW846 Method 7741. The POX analyses were performed at the ITAS Oak Ridge laboratory. The metals were analyzed at ITAS Cincinnati.

Reviewed and Approved by:

Craig H. Caldwell

Craig H. Caldwell
Laboratory Manager
CHC126 T9-12-123

III. Quality Control

Immediately following the analytical data for the samples can be found the QA/QC information that pertains to these samples. The purpose of this information is to demonstrate that the data enclosed is scientifically valid and defensible. This QA/QC data is used to assess the laboratory's performance during the analysis of the samples it accompanies. All quantitations were performed from within the calibrated range of the analytical instrument.

IV. Comments

Twelve of the samples for POC were analyzed in quadruplicate as the request for analyses received with the samples specified.

Client: Holloman AFB
Work Order: T9-12-123, X0-01-181 and X0-01-192
CHC127

IT ANALYTICAL SERVICES
CINCINNATI, OH

Client ID	Lab No.	POX, mg/L
Water # MW-011289	123-01	ND
		ND
		ND
		ND
Water # MW-121289	123-02	ND
Water # MW-081289	123-03	ND
Water # S-021289	123-04	ND
		ND
		ND
		ND

Detection Limit = 0.010 mg/L

ND = Not Detected

Client: Holloman AFB
Work Order: T9-12-123, X0-01-181 and X0-01-192
CHC128

IT ANALYTICAL SERVICES
CINCINNATI, OH

Client ID	Lab No.	POX, mg/L
Water # MW-060190	181-01	ND
		ND
		ND
		ND
Water # MW-040190	181-02	ND
		ND
		ND
		ND
Water # S-040190	181-03	ND
		ND
		ND
		ND
Water # MW-110190	181-04	ND
Water # MW-030190	181-05	ND
		ND
		ND
		ND
Water # MW-020190	181-06	ND
		ND
		ND
		ND

Detection Limit = 0.010 mg/L

ND = Not Detected

Client: Holloman AFB
Work Order: T9-12-123, X0-01-181 and X0-01-192
CHC129

IT ANALYTICAL SERVICES
CINCINNATI, OH

Client ID	Lab No.	POX, mg/L
Water # MW-080190	192-01	ND
		ND
		ND
		ND
Water # S-020190	192-02	ND
		ND
		ND
		ND
Water # MW-010190	192-03	ND
		ND
		ND
		ND
Water # MW-120190	192-04	ND
		ND
		ND
		ND
Water # MW-050190	192-05	ND
		ND
		ND
		ND
Water # MW-070190	192-06	ND

Detection Limit = 0.010 mg/L

ND = Not Detected

Client: Holloman AFB
Work Order: T9-12-123, X0-01-181 and X0-01-192
CHC130

IT ANALYTICAL SERVICES
CINCINNATI, OH

Sample ID	Lab No.	Arsenic ug/L	Selenium ug/L
Water # MW-011289	123-01	9.3	2.8
Water # MW-121289	123-02	9.9	4.6
Water # MW-081289	123-03	1.6	0.35
Water # S-021289	123-04	1.5	ND
Detection Limit		0.3	0.3

ND = Not Detected

Quality Control Results
Standard Reference Solutions

Analyte	Theoretical Value, mg/L	Percent Recovery
Arsenic	0.0075	98.1
Selenium	0.0075	91.3

All recoveries are within acceptable limits.

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NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: International Tech
County name:
Date received: 12-1-89 Time received: 2:20
Date collected: 12-1-89 Time collected: 10:00
Collected by: A. Hawke
Lab No.: 9808
Collection point: S-061289
Disinfecting System: ☐ Yes ☐ No
System owner:
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No.
☐ Routine ☐ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - *specify:* 3 dil CDU
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP. - ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS
Total (mpn) POSITIVE TUBES (confirmed)
Total (mpn) /100 ml
Total (mf) <100 /100 ml
Fecal (mpn) /100 ml
Fecal (mf) <100 /100 ml

Negative Control Noncoliforms 400 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

100x dilution

Analyst: Sharon Smith Date reported: 12-12-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: International Tech
County name:
Date received: 12-1-89 Time received: 2:20
Date collected: 12-1-89 Time collected: 10:15
Collected by: A. Hawke
Lab No.: 9807
Collection point: UW-061289
Disinfecting System: ☐ Yes ☐ No
System owner:
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No.
☐ Routine ☐ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - *specify:* 3 dil CDU
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP. - ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS
Total (mpn) POSITIVE TUBES (confirmed)
Total (mpn) /100 ml
Total (mf) <1 /100 ml
Fecal (mpn) /100 ml
Fecal (mf) <1 /100 ml

Negative Control Noncoliforms 56 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

No dilution

Analyst: Sharon Smith Date reported: 12-12-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS. OLD

MICROBIOLOGICAL WATER REPORT

RECEIVED
JAN 02 1990
IT CORP. - ALBUQUERQUE

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: International Deer
County name:
Date collected: 12-11-89
Time collected: 12:30
Collected by: A. Houska
Collection point: MW-041289
Disinfecting System: ☐ Yes ☐ No
System owner:
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - *specify:* 3 dil coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

International Deer
5301 Central Ave. NE
Suite 700
Alb. NM 87108

Date received: 12-11-89
Time received: 2:20
Lab No: 9806

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<1	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<1	/100 ml

Negative Control: Noncoliforms 3 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

No dilution

Analyst: Sharon Smith
Date reported: 12-12-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS. OLD

MICROBIOLOGICAL WATER REPORT

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: International Deer
County name:
Date collected: 12-12-89
Time collected: 10:30
Collected by: A. Houska
Collection point: MW-021289
Disinfecting System: ☐ Yes ☐ No
System owner:
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - *specify:* 3 dil coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP. - ALBUQUERQUE

Date received: 12-12-89
Time received: 4:29
Lab. No.: 9834

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<1	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<1	/100 ml

Negative Control: Noncoliforms 19 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

No dilution

Analyst: Sharon Smith
Date reported: 12-13-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: International Tech
County name:
Date received: 12-12-89 Time received: 4:29
Date collected: 12-12-89 Time collected: 10:45 Collected by: A. Hooska
Lab. No.: 9835
Collection point: MW-031289
Disinfecting System: ☐ Yes ☐ No
System owner:
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No.
☐ Routine ☐ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group
☒ Other - *specify:* 3 del coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP.-ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<1	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<1	/100 ml

Negative Control — Noncoliforms 7 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

No dilution

Analyst: Sharon Smith Date reported: 12-13-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

RECEIVED
JAN 02 1990

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. IT CORP.-ALBUQUERQUE *Please give full information to avoid report delay.*

Water Supply System name: International Tech
County name:
Date received: 12-12-89 Time received: 4:29
Date collected: 12-12-89 Time collected: 12:50 Collected by: A. Hooska
Lab. No.: 9852
Collection point: MW-031289
Disinfecting System: ☐ Yes ☐ No
System owner:
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No.
☐ Routine ☐ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group
☒ Other - *specify:* 3 del coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

International Tech.
301 Central Ave. NE Suite 700
Albq. NM 87108

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<10	/100 ml

Negative Control — Noncoliforms 730 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

10X

Analyst: Sharon Smith Date reported: 12-13-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS. OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name: International Tech
County name:
Date received: 12-12-89 Time received: 4:29
Date collected: 12-12-89 Time collected: 14:20 Collected by: A Houska
Lab. No.: 9833
Collection point: MW-071289
Disinfecting System: ☐ Yes ☐ No
System owner:
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - *specify:* 3 dil coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP.-ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<1	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<1	/100 ml

Negative Control: Noncoliforms 33 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

no dilution

Analyst: Sharon Smith Date reported: 12-13-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY - THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS. OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name:
County name: Otero
Date received: 12-13-89 Time received: 1505
Date collected: 12-13 Time collected: 0930 Collected by:
Lab. No.: 9850
Collection point: MW-8
Disinfecting System: ☐ Yes ☐ No
System owner:
RESIDUAL: mg/L

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - *specify:* 3 dil coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP.-ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)	POSITIVE TUBES (confirmed)	
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<10	/100 ml

Negative Control: Noncoliforms 170 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

10x

Analyst: Sharon Smith Date reported: 12-14-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type · Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	Date received 12 13 89 / Time received 1505
Date collected 12 13 89	Time collected 1045	Collected by	Lab. No. 9851
Collection point MW-1		Disinfecting System ☐ Yes ☐ No	
System owner		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - *specify:* 3 dil Coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP.-ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<10	/100 ml

Negative Control | Noncoliforms 10 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

10X

Analyst Sharon Smith | Date reported 12-14-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type · Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	Date received 12 13 89 / Time received 1505
Date collected 12 13 89	Time collected 1130	Collected by	Lab. No. 9852
Collection point MW-12		Disinfecting System ☐ Yes ☐ No	
System owner		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special ☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - *specify:* 3 dil Coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP.-ALBUQUERQUE

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
Total (mpn)		POSITIVE TUBES (confirmed)
Total (mpn)		/100 ml
Total (mf)	<10	/100 ml
Fecal (mpn)		/100 ml
Fecal (mf)	<10	/100 ml

Negative Control | Noncoliforms 10 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

10X

Analyst Sharon Smith | Date reported 12-14-89

NEW MEXICO STATE UNIVERSITY

Soil, Water, & Plant Testing Lab.
AGRONOMY & HORT., DEPT. 3Q
BOX 30003
LAS CRUCES, NEW MEXICO 88003-0003

MICROBIOLOGICAL WATER REPORT

SAMPLES ACCEPTED MONDAY THURSDAY ONLY
MUST BE ON ICE & LESS THAN 24 HRS OLD

Type - Print with ball-point pen. *Please give full information to avoid report delay.*

Water Supply System name		County name Otero	
Date collected 12 13 89	Time collected 1300	Collected by	
Collection point S-2		Disinfecting System ☐ Yes ☐ No	
System owner		RESIDUAL: mg/L	

☐ PUBLIC — Community ☐ Swimming Pool ☐ PRIVATE
☐ PUBLIC — Non-Community ☐ Other:

WSS Code No. ☐ Routine ☐ Special
☐ Check ☐ TNTC Recheck

TEST REQUIRED — *CHECK ONE*
☐ Potability - Coliform Group ☒ Other - ***specify:*** 3 dil Coli
☐ Fecal Coliform

SEND REPORT to the following (Name and Address)

RECEIVED
JAN 02 1990
IT CORP.-ALBUQUERQUE

Date received 12 13 89	Time received 12:15
Lab. No. 9853	

RESULTS of TESTS for COLIFORM GROUP

Tube	Volume	Presumptive 24 hr	Presumptive 48 hr	Confirmed 24 hr	Confirmed 48 hr	COMPLETED
A	10 ml					
B	10 ml					
C	10 ml					
D	10 ml					
E	10 ml					

COLIFORMS		
	Total (mpn)	POSITIVE TUBES (confirmed)
	Total (mpn)	/100 ml
	Total (mf)	<100 /100 ml
	Fecal (mpn)	/100 ml
	Fecal (mf)	<100 /100 ml

Negative Control | Noncoliforms 4700 /100 ml

☐ Complies ☐ Does not comply with the Safe Drinking Water Act

100X

Analyst Sharon Smith | Date reported 12 14 89

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Received: 09/29/89

ITRSL Oak Ridge REPORT
01/15/90 15:11:35

Work Order # R9-10-004

REPORT TO: IT CORPORATION/MIDDLEBROOK
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

ATTEN: JANICE STERRETT

CLIENT: ITAS SAMPLES: 8
COMPANY: IT CORPORATION/MIDDLEBROOK
FACILITY: MIDDLEBROOK PIKE

WORK ID: WATER SAMPLES-ITNA44233,44238
TAKEN:
TRANS:
TYPE:
P.O. #: 486000.04 - ITNA 44233, 44238
INV. #: 4738274

PREPARED BY: IT/RADIOLOGICAL SCIENCES LAB.
1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

ATTEN: ERS
PHONE: 615-482-9707

CERTIFIED BY

CONTACT: JIM DILLARD

ITNA 44233 - 4 SAMPLES; ITNA 44238 - 4 SAMPLES
REPORT AMENDED TO INCLUDE GROSS ALPHA AND GROSS BETA
RESULTS THAT WERE REPEATED.

	SAMPLE IDENTIFICATION
01	JJ6552
02	JJ6553
03	JJ6554
04	JJ6555
05	JJ6506
06	JJ6507
07	JJ6508
08	JJ6509

TEST CODES and NAMES used on this report

GALPHA	GROSS ALPHA
GBETAW	GROSS BETA
RA226	RA-226
SPEC	SPECIAL FORM FOR REPORTING

RECEIVED
JAN 22 1990
IT CORP.-ALBUQUERQUE

Received: 09/29/89

ITRSL Oak Ridge REPORT Work Order # R9-10-004
Results by Sample

SAMPLE ID JJ6552 FRACTION 01A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/27/89 Category 117392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<1		pCi/l
GROSS BETA	<238		pCi/l
TOTAL RADIUM	<5.0		pCi/l

SAMPLE ID JJ6553 FRACTION 02A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/27/89 Category 117392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	1	0.5	pCi/l
GROSS BETA	76	39	pCi/l
TOTAL RADIUM	5.3	0.9	pCi/l

ITRSL Oak Ridge REPORT Work Order # R9-10-004
Results by Sample

SAMPLE ID JJ6554 FRACTION 03A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/27/89 Category 117392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	2	1	pCi/l
GROSS BETA	202	66	pCi/l
TOTAL RADIUM	<5.0		pCi/l

SAMPLE ID JJ6555 FRACTION 04A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/27/89 Category 117392

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<1		pCi/l
GROSS BETA	<253		pCi/l
TOTAL RADIUM	<5.0		pCi/l

SAMPLE ID JJ6506 FRACTION 05A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/26/89 Category 117394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<2		pCi/l
GROSS BETA	196	63	pCi/l
TOTAL RADIUM	<5.0		pCi/l

SAMPLE ID JJ6507 FRACTION 06A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/26/89 Category 117394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<0.5		pCi/l
GROSS BETA	447	279	pCi/l
TOTAL RADIUM	10.1	1.5	pCi/l

SAMPLE ID JJ6508 FRACTION 07A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/26/89 Category 117394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	3	1	pCi/l
GROSS BETA	60	27	pCi/l
TOTAL RADIUM	<5.0		pCi/l

SAMPLE ID JJ6509 FRACTION 08A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 09/26/89 Category 117394

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
GROSS ALPHA	<0.7		pCi/l
GROSS BETA	<233		pCi/l
TOTAL RADIUM	6.2	1.0	pCi/l

APPENDIX E

A-E DAILY QUALITY CONTROL REPORTS

Project No. 301251.02.C

Date: 121089

Sheet No.: 012

Page 1 of 1

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 4TH ROUND - MONTHLY. RCRA gw sampling + analysis at Wastewater Treatment Lagoons.

Weather: Sunny, clear. High of ~50°F. Winds from NW increasing in late afternoon.

Work Performed: At 10 RCRA monitor wells:

(1.) Monitor background and wellbore headspace with a HNu photoionization detector; (2) measure depth to fluids and total well depth using an ORS interface probe. No immissible phases detected in any of the monitor wells. All down hole equipm deconned between wells.

Sampling Performed: NA

Problems and Corrective Actions: 2 locks required cutting (MW-1 and MW-5). Replacement locks to be provided by Sharon Moore, HAFB.

Quality Control Activities Initiated: Field equipment was calibrated before and after use.

Signature: Ann M Horska, IT-ABQ

Project No. 301251.02.04

Date: 121189

Sheet No.: 013

Page 1 of 1

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 4TH ROUND - MONTHLY. RCRA gw sampling + analysis at Wastewater Treatment Lagoons.

Weather: Morning clouds; temperature low ~10°F, high ~35°F. Strong afternoon winds from NW in afternoon.

Work Performed: Equipment calibration; purge (5 casing volumes) + sample 3 monitor wells; package samples for shipment; deliver coliform bacteria samples to NM State Univ. lab for analysis (within 6 hr holding time).

Sampling Performed: Monitor wells MW-4, MW-6 and S-4.

Problems and Corrective Actions: Federal Express did not arrive at the prearranged time/place to pick-up sample coolers. Sample coolers were maintained under full chain of custody and sent out with the 121289 Fed. Express pick-up.

Quality Control Activities Initiated: Field equipment calibrated daily before and after field use. A POX trip blank, provided by ITAS-Cincinnati was present in field + returned to ITAS-Cinc. along with other POX samples.

Signature: Ann M. Hawka, IT-ABQ

Project No. 301251.02.04

Date: 121289

Sheet No.: 014

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 4TH ROUND - MONTHLY. RCRA gw sampling + analysis at Wastewater Treatment Lagoons.

Weather: Cold, clear. Temperature: low ~ 10°F, high ~ 35°F Morning breezes/winds.

Work Performed: Equipmt calibration; purged (5 casing volumes) + sampled 4 monitor wells; packaged samples for shipment to analytical labs via Federal Express; hand delivered coliform bacteria samples to NMSU lab (within 6 hr holding time).

Sampling Performed: MW-2, MW-3, MW-5 and MW-7.

Problems and Corrective Actions: Federal Express picked up sample coolers from 121189 and 121289.

Quality Control Activities Initiated: Field equipment calibrated daily before and after field use.

Signature: Ann M Houska, IT-ABQ

Project No. 301251.02.04

Date: 121389

Sheet No.: 015

Page 1 of 1

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 4TH ROUND - MONTHLY. RCRA gw Sampling + analysis at Wastewater Treatment Lagoons.

Weather: Cold, clear. Temperature: low ~10°F, high ~40°F. Morning breezes / winds.

Work Performed: Equipment calibration; purged (5 casing volumes) + Sampled 4 monitor wells; packaged samples for shipment to analytical labs via Federal Express; hand delivered coliform bacteria samples to NMSU lab (within 6 hr holding time).

Sampling Performed: Up-gradient wells: MW-1 (plus environmental duplicates and QA samples for COE-Missouri River Div. Lab); and S-2. Down gradient well MW-8 (plus QA sample).

Problems and Corrective Actions: Sharon Moore, HAFB did not provide locks as prearranged. JT purchased 2 Key locks in Alamogordo to lock MW-1 and MW-5.

Quality Control Activities Initiated: Field equipment calibrated daily before + after field use. An envir. duplicate was collected at MW-1. Two COE-QA samples were collected, with the exception of coliform bacteria for QA analysis by COE-Missouri River Div. Lab. at MW-8 and MW-

Signature: Ann Houska - IT ABQ

All samples were maintained under full chain of custody procedures.

FIRST SEMIANNUAL
GROUND WATER SAMPLING REPORT
JANUARY 15 - JANUARY 17, 1990
HOLLOMAN AIR FORCE BASE, NEW MEXICO

Prepared for:

HQ TAC/DEEV
Langley AFB, Virginia 23665-5542

Under Contract with:

U.S. Army Corps of Engineers, Omaha District
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May 1990

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1.0 INTRODUCTION

International Technology Corporation (IT) is the prime Architect-Engineer (A-E) contracted by the U.S. Army Corps of Engineers, Omaha District, to implement a Resource Conservation and Recovery Act (RCRA) Ground Water Monitoring Program (described in Code of Federal Regulations Title 40, Part 265 [40 CFR 265]) at the sewage lagoons and Lakes Holloman and Stinky, Holloman Air Force Base, New Mexico. The ground water monitoring program is being performed under Contract No. DACW45-88-D-0008 and in accordance with the December 22, 1989, signed Federal Facility Compliance Agreement (FFCA) between Holloman Air Force Base, the New Mexico Environmental Improvement Division, and the U.S. Environmental Protection Agency, Region VI. As part of the ground water monitoring program, this ground water sampling episode, the fifth since August, 1989, was performed during the period January 15 through 17, 1990, by IT. This January, 1990, sampling episode is the first of a series of four semiannual sampling episodes planned at the Holloman Air Force Base sewage treatment lagoons monitoring wells designed to satisfy the semiannual and annual sampling requirements of 40 CFR 265.92(d)(1) and (2) and the FFCA. This report describes the results of the first semiannual sampling round. Ground water sampling was conducted in accordance with the Architect-Engineer Safety, Health and Emergency Response Plan (A-E SHERP) (IT, 1989a) and the Architect-Engineer Quality Control Plan/Sampling Plan for Groundwater Study and Monitoring Program, Holloman Air Force Base, New Mexico (A-E QCP/SP) (IT, 1989b). The A-E QCP/SP is based on the Hydrogeologic Investigation Report and Groundwater Monitoring Plan for the Sewage Treatment Lagoons, Holloman Air Force Base, NM 88330 (Radian, 1989). The ground water monitoring plan was approved by the EPA in 1989.

In accordance with the ground water monitoring requirements of 40 CFR 265.92(d), samples were collected and analyzed for concentrations of those parameters characterizing the ground water quality [40 CFR 265.92(b)(2)]. Concentrations for ground water contamination indicator parameters [40 CFR 265.92(b)(3)] were also determined in the samples. Descriptions of field methods employed and a discussion of analytical and quality control results are provided below. Job logs documenting daily field activities are presented in Appendix A.

2.0 FIELD METHODS AND MEASUREMENTS

Field measurements made prior to ground water sample collection determined the presence or absence of organic vapors and nonaqueous phase liquids in the wells, well water-levels, and total well depths. This information led to calculation of well-bore water volumes, the volumes of water to be purged prior to well sampling, and the frequency of field pH and specific conductance measurements taken during well purging. Data forms documenting field measurement activities are provided in Appendix B.

2.1 ORGANIC VAPOR DETECTION

The presence of organic vapors in a well-bore atmosphere can be an indicator of nonaqueous phase liquids possibly being present in the well. Prior to measuring water levels in each well, the well head atmosphere was analyzed for organic vapors using a calibrated Hnu PI-101 field photoionization detector with a 10.2-eV lamp. Calibration of the Hnu instrument was accomplished using a standard reference gas (100-ppm isobutylene/air) prior to analyzing any well head atmospheres. Additionally, a background organic vapor concentration value was measured at each well location by sampling the atmosphere at large. Then, immediately after opening the monitor well cap, the detector was inserted into the well casing and the organic vapor content was measured. Well head organic vapor concentrations ranged from not detectable to 0.2 parts per million (ppm) in the Holloman monitoring wells. All well head organic vapor measurement values were less than atmospheric background values. The low concentrations of measurable organic vapors in the well head atmospheres and the fact that all of the well head organic vapor values were less than background indicated a probable absence of nonaqueous phase liquids in the wells.

2.2 WATER LEVEL, TOTAL DEPTH, AND IMMISCIBLE ORGANIC LAYER DETERMINATIONS

Water level, total well depth, and the location or absence of immiscible organic layers were determined by measurement from surveyed points indicated on the tops of the well casings. An ORS interface probe, calibrated using a steel surveyor's tape, was used to measure the distances between top of casing and both water surface and well bottom. The ORS probe creates a beeping tone when water is encountered and a steady tone when encountering immiscible layers either less dense or denser than water. Immiscible layers were not detected

in any of the monitoring wells. Results of the water level and total well depth measurements, as well as calculated well volumes and sampling purge volumes, are listed in Table 1.

2.3 WELL EVACUATION

Well evacuation and ground water sampling were performed following procedures in the A-E QCP/SP. New protective clothing was donned by site personnel and nondedicated sampling equipment was decontaminated using nonphosphate detergent wash, tap water rinse, deionized water rinse, methanol and hexane rinses prior to actual well evacuations. Dedicated 1-1/2 inch diameter teflon bailers with stainless steel leaders attached to polypropylene ropes were used to purge and sample the wells. Approximately five well volumes of water were purged from the wells with five to seven measurements of pH, specific conductance, and temperature being recorded at intervals during bailing. Turbid water was initially noted in the bails from wells MW-1, S-2, and S-4. Water from these wells generally cleared as bailing progressed. An absence of particulates was noted in the bails from the remaining wells. Waters bailed from wells S-2, MW-2, MW-4, MW-5, and MW-7 were noted as being odorous. Field notes describing the well evacuations are contained in Appendix B. Following the purge of approximately five well volumes of water from each monitoring well, collection of ground water samples began.

2.4 GROUND WATER SAMPLING

The monitor wells were sampled upon completion of the purging criteria. The wells sampled include the upgradient wells MW-1 and S-2, and downgradient wells MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, and S-4. Quality assurance samples were also collected during this January, 1990, sampling episode. These samples included a blind field duplicate sample collected at well MW-1 and identified as well MW-12, two duplicate quality assurance samples collected at wells MW-1 and MW-8 which were forwarded to the U.S. Army Corps of Engineers, Missouri River Division Laboratory, Omaha, Nebraska, for independent analysis, and a trip blank sample for purgeable organic halides (POX) identified as well MW-11. Concentrations of analytes which were sampled in each of the wells are listed in the tables of analytical results (Tables 2 and 3).

Field Measurements

The parameters specific conductance, pH, and temperature were measured in the field during well purging, and before and after each sampling sequence. Specific conductance was determined using a Cole-Palmer model 1481-60 conductance meter in automatic temperature compensation mode. This meter is capable of determining the specific conductance of ground water over a wide range of values. This proved necessary to measure specific conductance of ground water from the Holloman sewage lagoon monitoring wells. All specific conductance measurements were made using the meter's 0 to 200,000 micromohs per centimeter (μmhos/cm) scale. The meter was calibrated daily by standard solution at the scale midpoint. pH was determined using an Orion SA-250 meter, calibrated at least daily. Temperature was determined using a mercury in glass thermometer. These field measurements were recorded on the field sampling data sheets located in Appendix B. Specific conductance and pH measurements are also summarized in Table 3.

Sample Collection

Ground water samples were obtained from each well by carefully pouring from the dedicated teflon bailers. All samples were poured directly into prepared sampling containers. There were no field filtrations of samples. Clean surgical gloves were donned immediately prior to sample collection. Ground water samples for laboratory analysis were collected in the following order:

Purgeable organic halides (POX)
Total organic carbon (TOC)
Metals (cations)
Phenolics
General chemistry (anions).

Sample Containers and Preservatives

Sample collection containers were supplied by the International Technology Analytical Services (ITAS) laboratories in Cincinnati, Ohio, Austin, Texas, and Middlebrook (Knoxville), Tennessee. Appropriate sample preservatives were added to the containers at the laboratory prior to shipment.

2.5 SAMPLE HANDLING AND SHIPMENT

All samples were isolated in sealable plastic bags and placed on ice in a shipping cooler immediately after collection. Samples were shipped by overnight carrier in a sealed shipping container with complete chain-of-custody documentation to the ITAS laboratories in

Middlebrook (Knoxville), Tennessee and Cincinnati, Ohio, and to the U.S. Army Corps of Engineers, Missouri River Division Laboratory in Omaha, Nebraska. Because of equipment failure at the ITAS Cincinnati, Ohio laboratory, samples for POX analysis were forwarded by that laboratory to the ITAS mixed waste laboratory in Oak Ridge, Tennessee, for analysis. Chain-of-custody documentation for all samples are located in Appendix C.

3.0 ANALYTICAL RESULTS

Samples from each of the wells were analyzed for the parameters listed in 40 CFR 265.92(b)(2) as ground water quality indicator parameters, and 40 CFR 265.92(b)(3) as ground water contamination indicator parameters. Laboratory analytical reports containing analytical results, quality control results, and method detection limits are presented in Appendix D. Summaries of analytical results are presented in Tables 2 and 3.

3.1 METHOD DETECTION LIMITS

Method detection limits (MDL) actually achieved by the analytical laboratories during analyses of the January, 1990, samples are listed in Table 5. The ground water quality parameter, phenols, and the contamination indicator parameter, POX, were analyzed for but not detected at the method detection limit values listed in Table 3. All other analyzed parameters, with the exception of one TOC replicate analysis from a sample collected at well S-4, were quantifiable above their respective method detection limits.

3.2 GROUND WATER QUALITY PARAMETERS

Analytical results for parameters indicating ground water quality including chloride, sodium, sulfate, iron, manganese, and phenols are listed in Table 2. While samples from the Holloman Air Force Base monitoring wells are generally typified as high in dissolved solids content, there are wide variations in major analyte concentrations from well to well. The lowest chloride concentrations were reported in the 900 to 2,000 mg/l range in samples from wells S-2 (upgradient), MW-2, MW-4, and MW-7 (downgradient). Samples from wells MW-3, MW-5, and MW-8 were reported having chloride concentrations between 2,000 and 6,000 mg/l. The greatest chloride concentrations were reported in samples from wells MW-1 (upgradient), MW-6 and S-4 (both downgradient), ranging from 32,000 to 36,000 mg/l. Chloride concentration in

MW-12, the environmental duplicate from well MW-1 was reported at 60,000 mg/l chloride. Sodium concentrations in the well samples followed the same general trend established by the chloride concentrations. Well samples exhibiting low chloride concentrations also exhibited low sodium concentrations. The corollary appears true for samples exhibiting high chloride concentrations. Sulfate concentrations ranged between 1,700 (MW-1) and 5,800 (S-4) mg/l in the well samples. Concentration values for iron ranged from approximately 26 (MW-6) to 705 (S-2) μg/l. Manganese concentrations were lowest in the two upgradient wells MW-1 and S-2, and the downgradient well S-4, ranging from approximately 14 to 109 μg/l. Manganese concentrations in the remaining downgradient wells ranged from 364 (MW-4) to 2,080 (MW-5) μg/l. Phenols were not detected in any of the samples at a MDL of 0.01 mg/l.

3.3 CONTAMINATION INDICATOR PARAMETERS

Concentrations of the ground water contamination indicator parameters (pH, specific conductance, total organic carbon, and purgeable organic halides) for samples from the Holloman Air Force Base monitor wells are listed in Table 3. Four replicate measurements of each contamination indicator parameter are reported for all the wells and the environmental duplicate (MW-12) laboratory analyzed parameters. pH values measured in the field after sampling ranged from 6.56 to 7.20 pH units. Specific conductance, also measured in the field, ranged from 5,200 to 95,400 μmhos/cm at 25°C. All specific conductance measurements were made using a conductivity meter set on a 0 to 200,000 μmhos/cm scale. Total organic carbon analytical results were distributed between not detectable at 1 mg/l to 8 mg/l across the Holloman well samples. Results for analyses of purgeable organic halides (POX) on the well samples are also reported in Table 3. Concentrations of POX were not detectable at 0.010 mg/l as chloride in all the analyzed samples.

4.0 QUALITY CONTROL

Field sampling procedures conforming to the A-E QCP/SP were documented daily on an "A-E Daily Quality Control Report for Ground Water Monitoring at Holloman Air Force Base, New Mexico" form. These daily quality control reports are contained in Appendix E.

Quality control (QC) samples were collected during the January, 1990, sampling effort for analysis in accordance with the procedures specified in the A-E QCP/SP. Environmental duplicate samples and purgeable organic halide trip blank samples were collected.

Duplicate samples from wells MW-1 and MW-8 were collected and transmitted to the U.S. Army Corps of Engineers, Missouri River Division Laboratory in Omaha, Nebraska, for independent analysis. An additional set of blind duplicate field samples were collected at well MW-1 and submitted to the ITAS laboratory for analysis. This blind duplicate sample is identified in Tables 2 and 3, as well number MW-12, where the analytical results are listed along with the results for the MW-1 sample analyses. Each duplicate sample fraction was collected from a new bail of ground water immediately after collecting the sample fraction in order to minimize variabilities due to time or sampling mechanics.

A purgeable organic halide (POX) trip blank sample was prepared at the IT-Albuquerque warehouse immediately prior to field personnel traveling to the sampling site, and was shipped to the analytical laboratory with the POX samples from the Holloman wells. The POX trip blank sample was designated as well number MW-11. Results of the POX trip blank sample analysis are listed in Table 3, and indicate that no in-transit contamination of the samples occurred.

Laboratory quality control data are contained within the Certificates of Analyses, Appendix D. The ITAS Middlebrook (Knoxville) laboratory performed matrix spike and matrix spike duplicate analyses on the sample from well MW-2. Matrix spike recovery exceeded control limits (75-125 percent) for manganese (65.2 percent). A post-digest spike analysis was performed for manganese and resulted in 63.2 percent recovery. The duplicate relative percent difference (RPD) values for all parameters were within control limits on the quality control analyses of sample MW-2. Any quality control data which exceeded controls were flagged by the ITAS Middlebrook (Knoxville) laboratory as required in the EPA CLP Statement of Work (July 1987). All other quality control data reported by ITAS Middlebrook (Knoxville) were within control limits.

Sample analysis holding times were met for all analyses of the January, 1990, Holloman well samples.

5.0 CONTINUING GROUND WATER MONITORING

Continued monitoring operations at the Holloman Air Force Base Sewage Treatment Lagoons will be determined following a data analysis satisfying the requirements of 40 CFR 265.93(b). The data collected in this sampling round will be compared statistically with data collected

during four previous sampling rounds (August through December, 1989). The statistical analysis entails calculating the arithmetic mean and variance based on the four replicate measurements of contamination indicator parameters on each sample from this January, 1990, sampling round. These are compared statistically to the initial background arithmetic mean for these parameters collected in earlier sampling rounds, i.e., the values for upgradient wells measured in the August through December, 1989, sampling episodes. The comparison considers individually each of the wells in the monitoring system and uses the Student's t-test at the 0.01 level of significance to determine statistically significant increases (and decreases, in the case of pH) relative to initial background that can be attributed to the lagoons.

If the data show no statistically significant contamination of ground water, the first annual sampling round (approximately one year following the first sampling episode in August, 1989) will be performed by IT. If data analysis shows significant contamination of ground water is occurring, a ground water quality assessment program will be developed and instituted (40 CFR 265.93), and all additional reporting requirements (40 CFR 265.94) will be met.

6.0 REFERENCES

International Technology Corporation (IT), 1989a, "Safety, Health & Emergency Response Plan (A-E SHERP)," Ground Water Detection Monitoring Program," Holloman Air Force Base, New Mexico.

International Technology Corporation (IT), 1989b, "A-E Quality Control Plan and Sampling Plan (A-E QCP/SP) For Groundwater Study and Monitoring Program," Holloman Air Force Base, New Mexico.

Radian Corporation, 1989, "Hydrogeologic Investigation Report and Proposed Groundwater Monitoring Plan for the Sewage Treatment Lagoons, Holloman Air Force Base, NM 88330," Holloman Air Force Base, New Mexico.

TABLE 1

GROUND WATER ELEVATIONS AND WATER VOLUMES PURGED FROM THE SEWAGE TREATMENT LAGOONS MONITORING WELLS HOLLOMAN AIR FORCE BASE, NEW MEXICO JANUARY 1990

MONITOR WELL	TOP OF[a] CASING ELEVATION (FAMSL)	DEPTH TO[b] GROUND WATER (FEET)	GROUND WATER ELEVATION (FAMSL)	TOTAL[b] DEPTH (FEET)	WELL VOLUME (GALLONS)	GALLONS DISCHARGED PRIOR TO SAMPLING	WELL VOLUMES DISCHARGED PRIOR TO SAMPLING
MW-1	4053.42	11.24	4042.18	17.81	4.3	22	5.1
S-2	4040.56	9.06	4031.50	20.24	1.8	10	5.6
MW-2	4039.78	5.03	4034.75	17.76	8.3	42	5.1
MW-3	4037.38	8.48	4028.90	17.71	6.0	30	5.0
MW-4	4030.30	5.53	4024.77	17.76	8.0	40	5.0
MW-5	4039.30	5.21	4034.09	17.73	8.1	41	5.1
MW-6	4031.21	7.36	4023.85	17.75	6.8	34	5.0
MW-7	4039.88	5.83	4034.05	17.70	7.7	39	5.1
MW-8	4040.50	5.92	4034.58	17.73	7.7	39	5.1
S-4	4034.46	9.19	4025.27	14.24	0.8	5	6.3

[a] A-E Groundwater Monitoring Report/Quality Control Summary for the First Groundwater Sampling Round Holloman Air Force Base, New Mexico, October 1989, Radian Corporation, Austin, TX.
[b] Reference from top of casing. Measured on January 15, 1990.

TABLE 2

CONCENTRATIONS OF GROUND WATER QUALITY PARAMETERS
SEWAGE TREATMENT LAGOONS MONITORING WELLS
HOLLOMAN AIR FORCE BASE, NEW MEXICO
JANUARY 1990

		MONITOR WELL					
PARAMETER	UNITS	MW-1	MW-12 (DUPLICATE MW-1)	S-2	MW-2	MW-3	MW-4
Chloride	mg/l	32,000	60,000	1,400	920	5,200	2,000
Iron	µ g/l	486	617	705	277	465	189
Manganese	µ g/l	28	30	109	714	1,220	364
Phenols	mg/l	0.01-U	0.01-U	0.01-U	0.01-U	0.01-U	0.01-U
Sodium	mg/l	7,000	7,380	707	524	2,010	1,450
Sulfate	mg/l	1,700	4,200	2,600	2,200	4,200	3,600

		MONITOR WELL				
PARAMETER	UNITS	MW-5	MW-6	MW-7	MW-8	S-4
Chloride	mg/l	4,200	33,000	1,200	2,800	36,000
Iron	µ g/l	453	26	138	66	422
Manganese	µ g/l	2,080	579	828	469	14
Phenols	mg/l	0.01-U	0.01-U	0.01-U	0.01-U	0.01-U
Sodium	mg/l	1,580	13,600	552	1,430	9,120
Sulfate	mg/l	2,200	4,400	2,200	3,300	5,800

U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.

TABLE 3

CONCENTRATIONS OF GROUND WATER CONTAMINATION INDICATOR PARAMETERS
SEWAGE TREATMENT LAGOONS MONITORING WELLS
HOLLOMAN AIR FORCE BASE, NEW MEXICO
JANUARY 1990

MONITOR WELL	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	TOTAL ORGANIC CARBON (mg/l)	PURGEABLE ORGANIC HALIDES (mg/l as Cl)
MW-1	6.57	59,500	2	ND
	6.58	59,800	1	ND
	6.58	59,700	1	ND
	6.56	60,400	1	ND
MW-12 (Duplicate MW-1)	NA	NA	1-U	ND
			1-U	ND
			1-U	ND
			1-U	ND
S-2	7.10	5,700	5	ND
	7.09	5,700	5	ND
	7.06	5,800	5	ND
	7.07	5,800	5	ND
MW-2	7.20	5,200	4	ND
	7.19	5,200	4	ND
	7.19	5,400	4	ND
	7.19	6,200	4	ND
MW-3	7.06	15,700	8	ND
	7.02	15,900	8	ND
	7.01	16,000	8	ND
	7.04	15,900	8	ND
MW-4	6.75	11,900	6	ND
	6.73	12,100	6	ND
	6.73	12,300	6	ND
	6.74	12,500	6	ND
MW-5	6.82	15,400	5	ND
	6.80	15,400	5	ND
	6.81	15,300	5	ND
	6.82	15,300	5	ND
MW-6	6.88	94,300	4	ND
	6.89	93,600	4	ND
	6.87	95,800	4	ND
	6.87	95,400	4	ND
MW-7	6.80	6,400	3	ND
	6.78	6,400	3	ND
	6.77	6,300	3	ND
	6.78	6,300	3	ND

TABLE 3

CONCENTRATIONS OF GROUND WATER CONTAMINATION INDICATOR PARAMETERS
SEWAGE TREATMENT LAGOONS MONITORING WELLS
HOLLOMAN AIR FORCE BASE, NEW MEXICO
JANUARY 1990
(CONTINUED)

MONITOR WELL	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	TOTAL ORGANIC CARBON (mg/l)	PURGEABLE ORGANIC HALIDES (mg/l as Cl)
MW-8	6.99	9,600	4	ND
	6.96	10,000	4	ND
	6.97	9,700	4	ND
	6.97	9,800	4	ND
S-4	7.01	63,600	1	ND
	7.02	64,100	1	ND
	7.02	64,500	1	ND
	7.02	64,900	1-U	ND
MW-11 (trip blank)	NA	NA	NA	ND

ND = Not detected at 0.010 mg/l as chloride.
U = Compound was analyzed for but not detected. The table value is the detection limit for the sample.
NA = Not Applicable.

TABLE 4

METHOD DETECTION LIMITS, SEWAGE TREATMENT LAGOONS MONITORING WELLS
HOLLOMAN AIR FORCE BASE, NEW MEXICO
JANUARY 1990

PARAMETER	DETECTION LIMIT
TOC	1 mg/L
POX	0.010 mg/L
Chloride	0.5 mg/L
Sulfate	1.5 mg/L
Phenols	0.01 mg/L
Iron	50 μg/L
Manganese	2 μg/L
Sodium	200 μg/L

APPENDIX A

JOB LOGS

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE - Holloman AFB DATE 011590

LOCATION Wastewater Treatment Lagoons JOB NUMBER 301251.02.05

WORK PERFORMED RCRA GW Sampling at Wastewater Treatment Lagoons — Fluid-level measurements, HAFB, Alamogordo, NM

PREPARED BY: A Houska SUPERVISOR D. Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc	A. Houska	0730	1325	—	1750	1735	[illegible]
APSc	M. Lyon	0730	1325	—	1750	1735	[illegible]
Tech	J. Boyd	0730	1325	—	1750	1735	[illegible]
						↑	
						[illegible]	

AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT
3 gal	Distilled Water	2 each	Rental vehicles		
1 day	HNu PID	1 day	decon equipment		
1 day	ORS probe				
1 sk	ice				
3/4 bx	Surgical gloves				
1	steel measuring tape				

TIME	FIELD ACTIVITY DAILY LOG
0730	Arrive at rental agency to pick-up vehicles.
0815	Arrive back at IT warehouse - load gear, purchase ice for trip blank
0835	Leave Albuquerque - drive to Holloman Air Force Base.
1325	Arrive at HAFB - get base pass.
1340	Arrive at WWT area - unload gear, sampling prep.
1400	Begin calibrating equipment. Take HNu PID and fluid-level measurements at all 10 monitor wells.
1750	Leave HAFB. Drive to check in motel in Alamogordo Unload equipment. ~~STOP~~
1735 ~~1745~~	STOP

COMPLETE ONE SHEET FOR EACH SHIFT

30-8-85(12 SM)

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE-Holloman AFB DATE 011690

LOCATION Wastewater Treatment Lagoons JOB NUMBER 301251.02.05

WORK PERFORMED RCRA gw sampling at Wastewater Treatment Lagoons, HAFB, Alamogordo, NM

PREPARED BY: A. Houska SUPERVISOR D. Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc	A. Houska	0650	0740	—	1615	1630	
APSc	M. Lyon	0650	0740	—	1615	1630	
Tech	J. Boyd	0650	0740	—	1615	1630	

AMT./HRS.	MATERIAL/EQUIPMENT	AMT./HRS.	MATERIAL/EQUIPMENT	AMT./HRS.	MATERIAL/EQUIPMENT
3/4 sks	Vermiculite	1 day	pH Meter	8 sets	Sampling containers
3/4 box	Surgical gloves	1 day	Scond meter		
5 pair	Nitrile gloves	1 day	thermometer		
10 ea	tyvek suites (white)	8 sks	ice		
2 rolls	duct tape	2 each	rental vehicles		
1/2 rolls	visqueen	1 day	decon equipment		

TIME	FIELD ACTIVITY DAILY LOG
0650	Load gear, calibrate equipmt + depart for HAFB. Stop to purchase ice enroute.
0740	Arrive at MW-06. Sample prep, purge gw and collect samples.
0925	Arrive at S-4. Sample prep, purge gw and collect samples.
1030	Depart S-4.
1040	Arrive at MW-4. Sample prep, purge gw and collect samples.
1210	Leave MW-4. Drive to WWT area. Get supplies from shed
1245	Arrive at MW-3. Sample prep, purge gw and collect samples.
1402	Arrive at MW-2. Sample prep, purge gw and collect samples.
1545	Return to WWT area; recalibrate equipment + complete packaging coolers for shipment.
1605	Fed Express arrives on-site to ~~col~~ pick-up packages.
1615	IT off-site
1630	Arrive in Alamogordo; unload gear - STOP

COMPLETE ONE SHEET FOR EACH SHIFT

30-8-85(12 5M)

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE - Holloman AFB DATE 011790

LOCATION Wastewater Treatment Lagoons JOB NUMBER 301251.02.05.

WORK PERFORMED RCRA gw sampling at Wastewater Treatment Lagoons, HAFB, Alamogordo, NM.

PREPARED BY: A. Houska SUPERVISOR D. Meyer

CLASS.	NAME	START	ARRIVED JOB	TIME OUT	LEFT JOB	STOP	TOTAL
APSc	A Houska	0645	0710	—	1610	1630	9.45
APSc	M Lyon	0645	0710	—	1610	1630	9.45
Tech	J. Boyd	0645	0710	—	1610	1630	9.45

AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT	AMT./ HRS.	MATERIAL/EQUIPMENT
1 1/4 sks	vermiculite	1 day	pH Meter	5 sets	Sampling Containers
1 Bx	Surgical gloves	1 day	S cond. meter		
5 pair	Nitrile gloves	1 day	thermometer		
10 each	Tyvek suites	6 sks	ice		
1 roll	duct tape	2 ea	rental vehicles		
1/8 roll	visqueen	1 day	decont. equipment		

FIELD ACTIVITY DAILY LOG

TIME	
0645	Load gear, calibrate equipment + depart for HAFB. Stop to purchase ice enroute.
0710	Arrive at WWT area - pick up necessary equipment.
0720	Arrive at MW-8; sampling prep, purge gw and collect samples. COE QA sample set collected also at this well
0910	Leave MW-8. Move to S-2; sample prep, purge gw and collect samples
1020	S-2 completed, return to WWT area for gear.
1035	Arrive at MW-1. Sample prep, purge gw and collect samples. One duplicate set (MW-12) and one COE QA set also ~~comp~~ collected at this well.
1225	Off of MW-1. Return to WWT area for gear + package samples for shipment
1310	Arrive at MW-5. Sample prep, purge well and collect sample.
1430	Arrive at MW-7. Sample prep, purge well and collect samples

COMPLETE ONE SHEET FOR EACH SHIFT

30-8-85(12 5M)

INTERNATIONAL TECHNOLOGY CORPORATION

JOB LOG

COMPANY COE - Holloman AFB

DATE 01/17/90

LOCATION

JOB NUMBER 301251.02.05

WORK PERFORMED See page 1

PREPARED BY: A. Houska

SUPERVISOR D. Meyer

TIME	FIELD ACTIVITY DAILY LOG
1545	Complete sample packaging for shipment. Recalibrate equipment
	Load gear into vehicles. Clean-up WWT area shed.
1605	Federal Express on-site to pick-up coolers.
1610	IT, Fed Express leave WWT Area.
1630	Arrive at motel in Alamogordo. Unload equipment. STOP.

COMPLETE ONE SHEET FOR EACH SHIFT

30-6-86(12.5M)

APPENDIX B

FIELD DATA

IT Project No. 301251.02.05

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-010190
DATE SAMPLED	011790
TIME	1200 (1) *
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-1
WELL/BORING DIAMETER (in)	4
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	~~4042.08~~ 4053.42 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.81
Depth to Groundwater (ft)	11.24
CALCULATIONS	
Thickness of Groundwater (ft)	6.57
Well Volume (gallons)	4.21
Purge Volume (gallons) for five casing volumes	21.37 → 22.0
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0.00 ppm.
  Date 011590 ; Time 1406
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA.

Time for MW-120190 = 1300.
Samples MW-010190, MW-120190 (environmental dupl.), and GMW-010190 (for COE) collected at [illegible] well. Parameters were alternated between the three samples beginning with [illegible] all bottles of the same parameter were filled in a sample set before [illegible] sample sets. A new bucket of gw was collected if sample sets were changed.

Well No. MW-1
Date 011 90
IT Project No. 301251.
COE-HAFB

ph Meter check against 7.00 buffer: Reading 6.95

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1113	4	17.0	6.58	58,600	[illegible]
1117	8	18.0	6.53	59,800	
1123	12	18.5	6.53	60,200	
1129	16	18.5	6.51	60,600	
1136	20	18.0	6.52	60,700	
1140	22	17.0	6.55	60,800	

Reading after sample collection: (4 replicates)

1159	18.0	6.57	59,500
1203	18.0	6.58	59,800
1207	18.0	6.58	59,700
1211	18.0	6.56	60,400

Additional Comments:

1-2°C warmer than downgradient wells

IT Project No. 301251.02.05

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	S-020190
DATE SAMPLED	011790
TIME	1000 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	S-2
WELL/BORING DIAMETER (in)	2
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4040.56 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	20.24
Depth to Groundwater (ft)	9.06
CALCULATIONS	
Thickness of Groundwater (ft)	11.18
Well Volume (gallons)	1.82
Purge Volume (gallons) for five casing volumes	9.09 → 10.0
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.3 ppm; Well borehole= 0.0 ppm.
  Date 011590 ; Time 1428
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA.

Well No. S-2
Date [illegible]
IT Project No. 301131
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.08 RECAL PH SCORE [illegible]

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0938	2	14.5	6.93	5,500	slightly turbid ~~[illegible]~~ slight [illegible]
0943	4	14.5	6.97	5,400	slight turbid
0947	6	15.0	6.78	5,500	"
0951	8	14.5	7.02	5,500	"
0955	10	14.5	7.07	5,500	

Reading after sample collection: (4 replicates)

1005	14.5	7.10	5,700
1009	14.5	7.09	5,700
1013	14.5	7.06	5,800
1017	15.0	7.07	5,800

Additional Comments:

IT Project No. 301251.02.05

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-020190
DATE SAMPLED	011690
TIME	1530 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-2
WELL/BORING DIAMETER (in)	4
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4039.78 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.76
Depth to Groundwater (ft)	5.3
CALCULATIONS	
Thickness of Groundwater (ft)	12.73
Well Volume (gallons)	8.28
Purge Volume (gallons) for five casing volumes	41.40 → 40
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.2 ppm; Well borehole= 0.00 ppm.
  Date 011590; Time 1526
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA.

Well No. MW-2
Date [illegible]
IT Project No. 301251.[illegible]
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.07

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1422	7	15.0	7.27	5,300	clear slight sour [illegible]
1429	14	15.0	7.25	5,300	"
1435	21	15.5	7.25	5,400	"
1441	28	15.5	7.23	5,300	"
1447	35	15.0	7.21	5,200	"
1452	42	15.5	7.20	5,200	"
					"

Reading after sample collection: (4 replicates)

1501	15.0	7.20	5,200	clear - odor of sour [illegible]
1506	15.0	7.19	5,200	"
1511	16.0	7.19	5,400	"
1516	16.0	7.19	6,200	"

Additional Comments:

IT Project No. 301251.02.05

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-030190
DATE SAMPLED	011690
TIME	1410 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-3
WELL/BORING DIAMETER (in)	4
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4037.38 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.71
Depth to Groundwater (ft)	2.43
CALCULATIONS	
Thickness of Groundwater (ft)	9.23
Well Volume (gallons)	6.00
Purge Volume (gallons) for five casing volumes	30.02
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

° HNu PID Background= 0.2 ppm; Well borehole= 0.35 ppm.
Date 011590 ; Time 1639

° See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.

° See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA .

Well No. MW-2
Date [illegible]
IT Project No. 301251.[illegible]
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.05 Recalib pH signal = 7.05

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1302	5	15.5	6.98	16,300	clear - no odor
1307	10	16.0	7.00	15,900	"
1313	15	16.0	7.02	15,700	"
1319	20	16.0	7.04	15,500	"
1325	25	17.0	7.03	15,500	"
1331	30	16.5	7.05	15,400	"

Reading after sample collection: (4 replicates)

1340	17.0	7.06	15,700
1344	17.0	7.02	15,900
1348	17.0	7.01	16,000
1352	16.5	7.04	15,900

Additional Comments:

IT Project No. 301251.02.05

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-040190
DATE SAMPLED	011690
TIME	1145 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-4
WELL/BORING DIAMETER (in)	4
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4030.30 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.76
Depth to Groundwater (ft)	5.53
CALCULATIONS	
Thickness of Groundwater (ft)	12.23
Well Volume (gallons)	7.96
Purge Volume (gallons) for five casing volumes	39.78
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.3 ppm; Well borehole= 0.0 ppm.
  Date 011590 ; Time 1657
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA.

Well No. MW-4
Date [illegible]
IT Project No. 301251...
COE-HAFB

ph Meter check against 7.00 buffer: Reading 6.97

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1103	5	14.0	6.77	11,200	clear · ~~slight~~ sewer odor
1109	10	15.0	6.76	11,500	" " "
1114	15	15.0	6.79	11,900	" " "
1119	20	15.0	6.77	12,100	" " "
1124	25	15.5	6.76	12,200	" " "
1130	30	15.5	6.75	12,100	" " "
1135	35	15.5	6.75	12,000	clear · slight odor
1140	40	15.5	6.76	12,000	

Reading after sample collection: (4 replicates)

1149	15.5	6.75	11,900
1153	16.0	6.73	12,100
1157	16.0	6.73	12,300
1201	16.0	6.74	12,500

Additional Comments:

IT Project No. 301251.02.05

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-050190
DATE SAMPLED	011790
TIME	1400 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-5
WELL/BORING DIAMETER (in)	4
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4039.30 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	5.21
Depth to Groundwater (ft)	17.73
CALCULATIONS	
Thickness of Groundwater (ft)	12.52
Well Volume (gallons)	3.14
Purge Volume (gallons) for five casing volumes	46.72 → [illegible]
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.3 ppm; Well borehole= 0.0 ppm.
  Date 011590; Time 1446
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA.

Well No. MW-5
Date [illegible]
IT Project No. 301251.02
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.03 Recal pH slope - 97

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1329	7	15.0	7.11	14,900	Clear - sewer odor
1336	14	15.5	6.96	15,300	" "
1343	21	15.5	6.90	15,300	" "
1349	28	15.5	6.85	15,300	"
1355	35	15.5	6.85	15,500	"
1400	41	15.5	6.83	15,600	"

Reading after sample collection: (4 replicates)

1409	15.5	6.82	15,400
1413	15.5	6.80	15,400
1417	15.5	6.81	15,300
1421	16.0	6.82	15,300

Additional Comments:

IT Project No. 301251.02.05

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-060190
DATE SAMPLED	011690
TIME	0840 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-6
WELL/BORING DIAMETER (in)	4
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4030 1.21 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.75
Depth to Groundwater (ft)	7.36
CALCULATIONS	
Thickness of Groundwater (ft)	10.39
Well Volume (gallons)	6.76
Purge Volume (gallons) for five casing volumes	33.7 → 34
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.2 ppm; Well borehole= 0.0 ppm.
  Date 011590; Time 1631
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA.

Well No. MW-[illegible]
Date [illegible]
IT Project No. 301251.[illegible]
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.07

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0815	5	16.0	7.31	93,700	Clear, no odor
0833	10	16.0	7.30	94,800	" " "
0824	15	15.5	7.05	93,300	" " "
0835	20	15.5	6.94	94,900	" " "
0842	25	16.0	6.92	94,800	" " "
0847	30	16.0	6.91	94,300	" "
0851	34	15.0	6.90	95,800	" "

Reading after sample collection: (4 replicates)

0901	16.0	6.88	94,300
0905	16.0	6.89	93,600
0909	16.0	6.87	95,800
0913	16.0	6.87	95,400

Additional Comments:

IT Project No. 301251.02.05

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-070190
DATE SAMPLED	011790
TIME	1530 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-7
WELL/BORING DIAMETER (in)	4
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4039.88 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.70
Depth to Groundwater (ft)	5.83
CALCULATIONS	
Thickness of Groundwater (ft)	11.87
Well Volume (gallons)	7.72
Purge Volume (gallons) for five casing volumes	38.61 → 39
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (µmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.2 ppm; Well borehole= 0.00 ppm.
  Date 011590 ; Time 1458
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA .

Well No. MW-7
Date [illegible]
IT Project No. 301251.[illegible]
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.01 Recal pH Slope = 96.9

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
1449	7	15.0	6.75	6,600	Clear slight odor
1456	14	16.0	6.78	6,700	"
1502	21	16.0	6.79	6,600	"
1508	28	16.0	6.79	6,500	
1514	35	16.5	6.78	6,600	
1518	39	16.0	6.78	6,500	

Reading after sample collection: (4 replicates)

1525	15.5	6.80 (6.80)	6,400
1529	16.0	6.78	6,400
1533	16.0	6.77	6,300
1536	15.5	6.78	6,300

Additional Comments:

IT Project No. 301251.02,(5

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	MW-080190
DATE SAMPLED	011790
TIME	0930
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	MW-8
WELL/BORING DIAMETER (in)	4
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4040.50 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	17.73
Depth to Groundwater (ft)	5.92
CALCULATIONS	
Thickness of Groundwater (ft)	11.81
Well Volume (gallons)	7.63
Purge Volume (gallons) for five casing volumes	38.41 → 3[illegible]
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.4 ppm; Well borehole= 0.00 ppm.
  Date 011590 ; Time 1516
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA.

Well No. MW-3
Date 011790
IT Project No. 301251...
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.00

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0802	7	14.0	7.08	7,700	clear, no odor
0810	14	15.0	6.97	10,500	"
0818	21	15.5	6.99	10,000	"
0825	28	15.0	6.99	9,900	"
0833	35	15.0	7.00	9,600	
0836	39	15.0	6.99	10,100	

Reading after sample collection: (4 replicates)

0852	15.0	6.99	9,600
0856	16.0	6.96	10,000
0900	15.5	6.97	9,700
0904	15.5	6.97	9,400

Additional Comments:

IT Project No. 301251.02.05.

GROUNDWATER FIELD DATA SHEET
COE-HOLLOMAN AIR FORCE BASE
WASTEWATER TREATMENT LAGOONS

Parameter Description	Value
SAMPLE CONTROL NUMBER	S-040190
DATE SAMPLED	011690
TIME	1000 (1)
SAMPLER'S INITIALS	AH, ML, JB
WELL/BORING LOCATION	S-4
WELL/BORING DIAMETER (in)	2
ELEVATION OF TOP OF WELL CASING REFERENCED TO MEAN SEA LEVEL (MSL)	4034.46 FAMSL
WATER-LEVEL MEASUREMENT	----
Total Depth (ft)	14.24
Depth to Groundwater (ft)	9.19
CALCULATIONS	
Thickness of Groundwater (ft)	5.05
Well Volume (gallons)	0.82
Purge Volume (gallons) for five casing volumes	4.11 → 5.0
NUMBER OF SAMPLE BOTTLES AND TYPE COLLECTED	See field notebook
pH	See page 2
Conductance (μmhos)	See page 2
Temperature (°C)	See page 2

COMMENTS:

- HNu PID Background= 0.3 ppm; Well borehole= 0.2 ppm.
  Date 011590 ; Time 1620
- See field notebook for equipment type and calibration data; equipment calibrated at beginning and end of each field day.
- See field notebook for decontamination procedure.

(1) Coliform Bacteria sample collection time = NA.

Well No. S-4
Date 011690
IT Project No. 301251...
COE-HAFB

ph Meter check against 7.00 buffer: Reading 7.07

PURGING DATA:

TIME	VOLUME PURGED (GAL)	TEMP (C°)	pH	SC (umHos/cm)	COMMENTS
0945	1	15.0	6.49	63,000	cloudy - no odor
0949	2	15.5	6.77	62,800	" "
0953	3	15.5	6.98	63,600	" "
0957	4	15.5	6.96	63,100	clearing "
1001	5	15.0	7.01	63,500	

Reading after sample collection: (4 replicates)

1010	16.0	7.01	63,600	Slightly turbid
1014	16.0	7.02	64,100	
1018	16.0	7.02	64,500	
1022	15.5	7.02	64,900	

Additional Comments:

Recalib. pH meter slope 15.5

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IT CORPORATION

WATER LEVEL INDICATOR CALIBRATION

* Pre-measurement calibration

EQUIPMENT NUMBER SIN 06-01535

EQUIPMENT NAME ORS Interface Probe

DATE 1/15/90 DATE LAST CALIBRATED unknown

~~CALIBRATION PERIOD~~ Time = 1355. Calibrated against steel tape to 40.0 feet.

Interface Probe MARKER (FT.)	CALIBRATED READING (FT) Steel tape	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT)	MARKER (FT.)	CALIBRATED READING (FT)
0	NA								
5	5.0	105		205		305		405	
10	10.0	110		210		310		410	
15	15.0	115		215		315		415	
20	20.0	120		220		320		420	
25	25.0	125		225		325		425	
30	30.0	130		230		330		430	
35	35.0	135		235		335		435	
40	40.0	140		240		340		440	
45		145		245		345		445	
50		150		250		350		450	
55		155		255		355		455	
60		160		260		360		460	
65		165		265		365		465	
70		170		270		370		470	
75		175		275		375		475	
80		180		280		380		480	
85		185		285		385		485	
90		190		290		390		490	
95		195		295		395		495	
100		200		300		400		500	

NOTE: ACCEPTANCE IS ± 0.1 FEET

SIGNED Ann Houseke

IT CORPORATION

WATER LEVEL INDICATOR CALIBRATION

* After field-use calibration

EQUIPMENT NUMBER 06-01535

EQUIPMENT NAME ORS Interface Probe

DATE 1/15/90 DATE LAST CALIBRATED 1/15/90

~~CALIBRATION~~ PERIOD Time = 1705

Interface Probe MARKER (FT.)	CALIBRATED READING (FT)	MARKER (FT.)	CALIBRATED READING (FT.)	MARKER (FT)	CALIBRATED READING (FT.)	MARKER (FT.)	CALIBRATED READING (FT)	MARKER (FT)	CALIBRATED READING (FT)
0	NA								
5		105		205		305		405	
10		110		210		310		410	
15		115		215		315		415	
20		120		220		320		420	
25		125		225		325		425	
30		130		230		330		430	
35		135		235		335		435	
40		140		240		340		440	
45		145		245		345		445	
50		150		250		350		450	
55		155		255		355		455	
60		160		260		360		460	
65		165		265		365		465	
70		170		270		370		470	
75		175		275		375		475	
80		180		280		380		480	
85		185		285		385		485	
90		190		290		390		490	
95		195		295		395		495	
100		200		300		400		500	

NOTE: ACCEPTANCE IS ± 0.1 FEET

SIGNED Ann Horska

APPENDIX C

SAMPLE CHAIN-OF-CUSTODY DOCUMENTATION

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 62443

C/C Control No. 146011

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214442

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-060190	Monitor well MW-6	011690; 0840	Ground water	Amber glass	OK @ 3°C [illegible] 1-16-90	
↓	↓	↓	↓	CPE	↓	
				Amber glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [illegible], IT Corp, 011690; 1550

   Received By: [illegible] ITAS 1-17-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 449601

00081

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 62443
C/C Control No. 146011

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/16/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-060190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
		1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By S Hari ITAS Date/Time 1-17-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44960

00076

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 62444

C/C Control No. 146012

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214442

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S-040190	Monitor well S-4	011690; 1000	Ground water	Amber Glass	OK @ 3°C 1-16-90	
↓	↓	↓	↓	CPE		
↓	↓	↓	↓	Amber Glass		
↓	↓	↓	↓	CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp, 011690; 1551

   Received By: S Hari ITAS 1-17-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44960

00082

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 62444
C/C Control No. 146012

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM, 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/16/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave., NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505)262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-040190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
		1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By S Harri ITAS Date/Time 1-17-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44960

00077

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 62445

C/C Control No. 146010

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214442

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-040190	Monitor well MW-4	011690, 1145	Ground water	Amber glass	OK @ 3°C [illegible] 1-16-90	
↓	↓	↓	↓	CPE	↓	
↓	↓	↓	↓	Amber glass	↓	
↓	↓	↓	↓	CPE	↓	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska; 011690; JTCorp; 1552

   Received By: S Blair ITAS 1-17-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00080

ITNA 44960

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 62445
C/C Control No. 146010

PROJECT NAME: COE-Holloman AFb
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/16/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-040190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
↓	↓	1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By S. Hari ITAS Date/Time 1-17-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44960

00075

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 110688

C/C Control No. 115075

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214442

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-030190	Monitor well MW-3	011690; 1410	Groundwater	Amber glass	OK @ 4°C [illegible] 1-16-90	
↓	↓	↓	↓	CPE		
				Amber glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska; IT Corp; 011690; 1600

   Received By: [illegible] ITAS 1-17-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00079

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44960

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 110688
C/C Control No. 115075

PROJECT NAME: COE-Holloman AFb
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/16/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-030190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
		1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By S Harris ITAS Date/Time 1-17-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44960

00074

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 110686

C/C Control No. 115077

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330214442

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-020190	Monitor well MW-2	011690; 1530	Groundwater	Amber glass	OK @ 4°C SPA 1-16-90	
↓	↓	↓	↓	CPE	↓	
				Amber glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska; IT Corp; 011690; 1601

   Received By: S Hain ITAS 1-17-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 44960

00078

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 110686
C/C Control No. 115077

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/16/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-020190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
		1 l	; HNO_3	T. MEtals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By S Hari ITAS Date/Time 1-17-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

ITNA 44960

00073

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 110683

C/C Control No. 146004

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 5346357822

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-080190	Monitor well MW-8	011790, 0830	Ground water	Amber glass	OK, SaK, 1-18-90	
↓	↓	↓	↓	CPE	Cooler temp 3°C	
				Amber glass	↓	
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp; 011790; 1505

   Received By: Sa Kennedy, ITAS, 1-18-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

00077

ITNA 4496

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 111471

C/C Control No. 114679

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Cincinnati

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 4330 2|4~~442~~ 0MH |25

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-060190	Monitor well MW-6	011690 ; 0840	Groundwater	Amber glass; Septa Cap		
MW-040190	MW-4	1145				
S-040190	S-4	1000				
MW-110190	MW-11	0730				
MW-030190	MW-3	1410				
MW-020190	MW-2	1530				

RECEIVED

FEB 1; 1990

IT CORP. - ALBUQUERQUE

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska; IT Corp; 011690; 1550

   Received By: Glenn Keilhog PEI 1-17-90

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

X0-01-101

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111471
C/C Control No. 114679

PROJECT NAME	COE-Holloman AFB	DATE SAMPLES SHIPPED	01/16/90
PROJECT NUMBER	301251.02.05	LAB DESTINATION	ITAS-Cincinnati
PROJECT MANAGER	Dann Meyer	LABORATORY CONTACT	Craig Caldwell
BILL TO	International Technology Corporation 5301 Central Ave, NE, Suite 700 Albuquerque, NM 87108	SEND LAB REPORT TO	International Technology Corp. 5301 Central Ave, NE, Suite 700 Albuquerque, NM 87108
PURCHASE ORDER NO.	90-099	DATE REPORT REQUIRED	02/09/90
		PROJECT CONTACT	Dann Meyer
		PROJECT CONTACT PHONE NO.	(505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-060190	Ground water	250 ml x 4	ice	POX x4	See attached sheets
MW-040190	↓	↓ ↓	↓	↓ ↓	for specific anlaytical
S-040190	↓	↓ ↓	↓	↓ ↓	requirements.
MW-110190	↓	250 ml x 1	↓	POX x 1	
MW-030190	↓	250 ml x 4	↓	POX x 4	
MW-020190	↓	250 ml x 4	↓	↓ ↓	

RECEIVED
FEB 1 1990
IT CORP.-ALBUQUERQUE

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By Glenna Keilholz **Date/Time** 1-17-90

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

R.F.A. **REQUEST FOR ANALYSIS**

R/A Control No. 166747

C/C Control No.

PROJECT NAME: Same as 166746

PROJECT NUMBER:

PROJECT MANAGER:

BILL TO:

DATE SAMPLES SHIPPED: 1/22/90

LAB DESTINATION: Same as RFA 166746

LABORATORY CONTACT:

SEND LAB REPORT TO: 35787

ITAC ~~35788~~

PURCHASE ORDER NO.: ITC-90121
JTN 805242

DATE REPORT REQUIRED: 1-24-90

PROJECT CONTACT:

PROJECT CONTACT PHONE NO.:

Sample No	~~Sample Type~~ Cincinnati Lab No Sample type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-060190	X0-01-181-01A	H2O	none	POX	Analyze in Quad
MW-040190	02A				
S-040190	03A				
MW-110190	04A				Analyze singly
MW-030190	05A				Analyze in Quad
MW-020190	06A				
	Sampled 1/16/90 - Holding	time expires		1/30/90 Rec'd	2°C

RECEIVED
FEB 16 1990
IT CORP.-ALBUQUERQUE

TURNAROUND TIME REQUIRED (Rush must be approved by the Project Manager)

Normal ____ Rush ✓ ~~(Subject to rush surcharge)~~ Waived

POSSIBLE HAZARD IDENTIFICATION (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ✓ Flammable ____ Skin Irritant ? brine Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab ✓

FOR LAB USE ONLY

Received By D. Kennebrew Date/Time 1-23-90 / 9:30

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 110683
C/C Control No. 146004

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/17/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-080190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
↓	↓	1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
↓	↓	1 l	; H_2SO_4	Phenolics	requirements.
↓	↓	1 l	↓	Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 1-18-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00078

ITN 44961

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 110684

C/C Control No. 146005

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 5346 357822

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
S-020190	Monitor well S-2	011790; 1000	Ground water	Amber glass	OK, Sak, 1-18-90	
↓	↓	↓	↓	CPE	cooler temp 1°C	
↓	↓	↓	↓	Amber glass	↓	
↓	↓	↓	↓	CPE	↓	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: BioloGical

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp, 011790, 1510

   Received By: Sa Kennedy, ITAS, 1-18-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

180001

WHITE - To accompany samples
YELLOW - Field copy

ITAA 4496-6

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 110684
C/C Control No. 146005

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/17/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
ALBUQUERQUE, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
S-020190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
↓	↓	1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ Flammable ____ Skin Irritant ____ Highly Toxic ____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ Disposal by Lab X

FOR LAB USE ONLY

Received By SA Kennedy Date/Time 1-18-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00082

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 62442
C/C Control No. 146008

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/17/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-010190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
		1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By SA Kennedy Date/Time 1-18-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00071

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 62441

C/C Control No. 115076

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 5346357822

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-120190	Monitor well MW-12	011790, 1300	Groundwater	Amber glass	OK, sak, 1-18-90	
↓	↓	↓	↓	CPE	Cooler temp 3°C	
				Amber glass	↓	
↓	↓	↓	↓	CPE		

Special Instructions: If sample is received damaged, or seal is broken, cotnact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 011790; 1559

   Received By: Sa Kennedy, ITAS, 1-18-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00079

WHITE To accompany samples
YELLOW Field copy

ITNA 44966

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 62441
C/C Control No. 115076

PROJECT NAME: COE-Holloman AFb
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/17/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-12019D	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
		1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By SA Kennedy Date/Time 1-18-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00080

INA 4491

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 62446

C/C Control No. 146007

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express ~~4330214442~~ 5346357822

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-050190	Monitor well MW-5	011790 ; 1400	Groundwater	Amber glass	OK, Sak 1-18-90	
↓	↓	↓	↓	CPE	Cooler temp. 2°c	
↓	↓	↓	↓	Amber glass	↓	
↓	↓	↓	↓	CPE	↓	

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska, IT Corp, 011790; 1600

   Received By: SA Kennedy, ITAS, 1-18-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00073

WHITE To accompany samples
YELLOW - Field copy

ITNA 44966

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 62446
C/C Control No. 146007

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/17/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-050190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
		1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
		1 l	; H_2SO_4	Phenolics	requirements.
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By Sa Kennedy Date/Time 1-18-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00074

No 4496

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 110682

C/C Control No. 146006

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Knoxville

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 5346357822

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-070190	Monitor well MW-7	011790; 1530	Ground water	Amber glass	OK, Sak, 1-18-90	
				CPE	cooler temp 2°C	
				Amber glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M. Houska; IT Corp; 011790; 1601

   Received By: SA Kennedy, ITAS, 1-18-90 0900

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

00076

WHITE - To accompany samples
YELLOW - Field copy

ITNA 4491.1

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 110682
C/C Control No. 146006

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-098

DATE SAMPLES SHIPPED: 01/17/90
LAB DESTINATION: ITAS-Knoxville
LABORATORY CONTACT: Mary Tyler
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-07D190	Ground water	250 ml	Ice; H_2SO_4	TOC x 4	See attached sheets
↓	↓	1 l	; HNO_3	T. Metals (Fe, Mn, Na)	for specific analytical
↓	↓	1 l	;H_2SO_4	Phenolics	requirements.
↓	↓	1 l	↓	Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other Biological (Please Specify)

SAMPLE DISPOSAL (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab X

FOR LAB USE ONLY

Received By SA Kennedy Date/Time 1-18-90 0900

WHITE - Original, to accompany samples
YELLOW - Field copy

00075

ITNA 4496

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 111473

C/C Control No. 114684

PROJECT NAME/NUMBER COE-Holloman AFB/301251.02.05

LAB DESTINATION ITAS-Cincinnati

SAMPLE TEAM MEMBERS A. Houska, M. Lyon

CARRIER/WAYBILL NO. Federal Express 5346357763

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MW-080190	Monitor well MW-8	011719	Groundwater	Amber glass	Samples were received cold & in good condition. Air bill was returned	
S-020190	S-2					
MW-010190	MW-1					
MW-120190	MW-12					
MW-050190	MW-5					
MW-070190	MW-7					

RECEIVED

FEB 1 5 1990

IT CORP.-ALBUQUERQUE

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Houska, IT Corp, 011790, 1600

   Received By: [illegible] 1/18/[illegible]

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111473
C/C Control No. 114684

PROJECT NAME: COE-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO. 90-099

DATE SAMPLES SHIPPED: 01/17/90
LAB DESTINATION: ITAS-Cincinnati
LABORATORY CONTACT: Craig Caldwell
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO. (505) 262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-080190	Ground water	250 ml x 4	ice	POX x 4	See attached sheets for specific analytical requirements.
S-020190	↓	↓	↓	↓	
MW-010190	↓	↓	↓	↓	
MW-120190	↓	↓	↓	↓	
MW-050190	↓	↓	↓	↓	
MW-070190	↓	↓	↓	↓	

RECEIVED
FEB 16 1990
IT CORP.-ALBUQUERQUE

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By [illegible] **Date/Time** _____

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 166748
C/C Control No.

PROJECT NAME: Same as RFA 166746
PROJECT NUMBER:
PROJECT MANAGER:
BILL TO:

DATE SAMPLES SHIPPED: 1/22/90
LAB DESTINATION: Same as RFA 166746
LABORATORY CONTACT:
SEND LAB REPORT TO:

ITAC 35783

PURCHASE ORDER NO.: ITC-90121
JTN 805242

DATE REPORT REQUIRED:
PROJECT CONTACT:
PROJECT CONTACT PHONE NO.:

Cincinnati lab No Sample type

Sample No	~~Sample Type~~	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MW-080190	X0-01-192-01A	H_2O	none	POX	Analyze in quad
S-020190	02A				
MW-010190	03A				
MW-120190	04A				
MW-050190	05A				
MW-070190	06A				
	Sampled 1/17/90 - Holding time expires			1/31/90	

RECEIVED
FEB 15 1990
IT CORP.-ALBUQUERQUE

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal ____ Rush ✓ (~~Subject to rush surcharge~~) Waived

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard ✓ Flammable ____ Skin Irritant ? Brine Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client ____ Disposal by Lab ✓

FOR LAB USE ONLY
Received By: D. Kennebrew Date/Time: 1-23-90 / 930

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. [illegible]

C/C Control No. 146014

PROJECT NAME/NUMBER [illegible]

LAB DESTINATION USACE-Missouri River Div. Lab.

SAMPLE TEAM MEMBERS [illegible]

CARRIER/WAYBILL NO. Federal Express 5346351844

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-080190	[illegible] MW8	011790; 0830	Groundwater	Amber glass		
↓	↓	↓	↓	Amber glass		
				CPE		
				Amber glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately

Possible Sample Hazards: Biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Hovicka; IT Corp; 011790; 1550

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 118694

C/C Control No. _____

PROJECT NAME [illegible]

PROJECT NUMBER [illegible]

PROJECT MANAGER Dan Meyer

BILL TO International Technology Corporation
[illegible] Central Ave, NE, Suite 700
Albuquerque, NM 87108

PURCHASE ORDER NO. NA

DATE SAMPLES SHIPPED [illegible]

LAB DESTINATION [illegible]

LABORATORY CONTACT [illegible]

SEND LAB REPORT TO International Technology Corp.
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108

DATE REPORT REQUIRED 02/09/90

PROJECT CONTACT Dann Meyer

PROJECT CONTACT PHONE NO. (505)262-2800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-080190	Ground water	250 ml	ice; H_2SO_4	TOC x 4	See attached sheets
		250 ml x 4		POX x 4	for specific analytical
		1 l	HNO_3	T. MEtals (Fe, Mn, Na)	requirements.
		1 l	H_2SO_4	Phenolics	
		1 l		Wet chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard _____ **Flammable** _____ **Skin Irritant** _____ **Highly Toxic** _____ **Other** Biological
(Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By _____ **Date/Time** _____

WHITE - Original, to accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 11413

C/C Control No. 146015

PROJECT NAME/NUMBER Chisholm [illegible] 0012.01.02.05

LAB DESTINATION USACE-Missouri River Div. Lab.

SAMPLE TEAM MEMBERS A. Hanska, H. Lyon

CARRIER/WAYBILL NO. Federal Express 5346357844

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
QMW-010190	Monitor well MW-1	011790, 1200	Groundwater	Amber glass		
↓	↓	↓	↓	Amber glass		
				CPE		
				Amber glass		
				CPE		

Special Instructions: If sample is received damaged, or seal is broken, contact project manager immediately.

Possible Sample Hazards: biological

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Ann M Hanska, ITCorp, 011790, 1555

   Received By:

2. Relinquished By:

   Received By:

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 111475
C/C Control No. 146015

PROJECT NAME: Cor-Holloman AFB
PROJECT NUMBER: 301251.02.05
PROJECT MANAGER: Dann Meyer
BILL TO: International Technology Corporation
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
PURCHASE ORDER NO.: NA

DATE SAMPLES SHIPPED: 01/17/90
LAB DESTINATION: USACE-Missouri River Div. Lab.
LABORATORY CONTACT: Dr. Joe Solsky
SEND LAB REPORT TO: International Technology Corp.
5301 Central Ave, NE, Suite 700
Albuquerque, NM 87108
DATE REPORT REQUIRED: 02/09/90
PROJECT CONTACT: Dann Meyer
PROJECT CONTACT PHONE NO.: (505) 262-3800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
QMW-010190	Groundwater	250 ml	ice, H_2SO_4	TOC x4	See attached sheets
		250 ml x 4		POX x 4	for specific analytical
		1 l	HNO_3	T. MEtals (Fe, Mn, Na)	requirements.
		1 l	H_2SO_4	Phenolics	
		1 l		Wet Chem (chloride, sulfate)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal X **Rush** ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard ____ **Flammable** ____ **Skin Irritant** ____ **Highly Toxic** ____ **Other** Biological (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client ____ **Disposal by Lab** X

FOR LAB USE ONLY

Received By ____ **Date/Time** ____

WHITE - Original, to accompany samples
YELLOW - Field copy

APPENDIX D

CERTIFICATES OF ANALYSES

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

January 30, 1990

Job Number: ITNA 44960

P.O. Number: 301251.02.05

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	01/17/90
Number of Samples:	Five (5)
Sample Type:	Water

I. Introduction

On 01/17/90, five (5) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for total organic carbon (TOC) in quadruplicate by chemical wet oxidation/infrared detection based on EPA SW-846 method 9060.

The samples were analyzed for phenols by colorimetric determination based on EPA SW-846 method 9065.

The samples were analyzed for the requested anions by ion chromatography using EPA method 300.0.

Reviewed and Approved:

Alyce Moore
Laboratory Manager

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III. Quality Control

Routine laboratory level I QC was followed.

The TOC analyses were performed on 01/22 and 01/23/90. No problems were encountered.

The phenol analyses were performed on 01/24/90. No problems were encountered.

The anion analyses were performed on 01/25/90. No problems were encountered.

International Technology
January 30, 1990

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44960

TOTAL ORGANIC CARBON ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
MW-020190	KK2168	4
MW-020190	KK2168	4
MW-020190	KK2168	4
MW-020190	KK2168	4
MW-030190	KK2169	8
MW-030190	KK2169	8
MW-030190	KK2169	8
MW-030190	KK2169	8
MW-040190	KK2170	6
MW-040190	KK2170	6
MW-040190	KK2170	6
MW-040190	KK2170	6
MW-060190	KK2171	4
MW-060190	KK2171	4
MW-060190	KK2171	4
MW-060190	KK2171	4
S-040190	KK2172	1
S-040190	KK2172	1
S-040190	KK2172	1
S-040190	KK2172	1
Method Blank	D0370/D0374	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 01/22 and 01/23/90

International Technology
January 30, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44960

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Chloride	Sulfate
Method Blank	P0847	0.5 U	1.5 U
MW-020190	KK2178	920	2,200
MW-030190	KK2179	5,200	4,200
MW-040190	KK2180	2,000	3,600
MW-060190	KK2181	33,000	4,400
S-040190	KK2182	36,000	5,800
Date Analyzed:		01/25/90	01/25/90

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 30, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44960

PHENOLS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
Method Blank	P0844	0.01 U
MW-020190	KK2173	0.01 U
MW-030190	KK2174	0.01 U
MW-040190	KK2175	0.01 U
MW-060190	KK2176	0.01 U
S-040190	KK2177	0.01 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 01/24/90

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

January 25, 1990

Job Number: ITNA 44960

P.O. Number: 301251.02.05

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	01/17/90
Number of Samples:	Five (5)
Sample Type:	Water

I. Introduction

On 01/17/90, five (5) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that CLP data are not blank corrected.

The samples were analyzed for the requested metals by inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

III. Quality Control

The samples were digested on 01/22/90 for ICP. The requested metals were analyzed by ICP on 01/23/90. All run QC was acceptable. A duplicate/spike pair was prepared using sample number MW-020190. Spike recovery (accuracy) results were outside control limits for manganese. A post digestion spike was analyzed and reported as required by CLP protocol. Duplicate RPD (precision) results were within control limits for all requested parameters. No problems were encountered.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA44960 SAS No.: _____ SDG No.: MW-020190

SOW No.: 7/87

EPA Sample No.	Lab Sample ID.
MW-020190 OS	KK2183 OS
MW-020190 D	KK2184 D
MW-020190 S	KK2185 S
MW-030190	KK2186
MW-040190	KK2187
MW-060190	KK2188
S-040190	KK2189

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

METALS Lab Manager: _____

Date: _____

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply
X - Detection limits higher than normal due to sample matrix interferences.

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-020190

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: IT-STU Case No.: MNA44960 SAS No.: _____ SDG No.: MW-020190

Matrix (soil/water): WATER Lab Sample ID: KK2183 OS

Level (low/med): _____ Date Received: 01/17/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	277			P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	714		NE	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	524000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-030190

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA4496 SAS No.: _____ SDG No.: MW-020190

Matrix (soil/water): WATER Lab Sample ID: KK2186

Level (low/med): _____ Date Received: 01/17/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	465			P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	1220		NE	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	2,010,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: Colorless Clarity Before: Clear Texture: _____

Color After: Colorless Clarity After: Clear Artifacts: _____

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-040190

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA44960 SAS No.: _____ SDG No.: MW-020190

Matrix (soil/water): WATER Lab Sample ID: KK2187

Level (low/med): _____ Date Received: 01/17/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	189			P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	3164		NE	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	1,450,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: Colorless Clarity Before: Clear Texture: _____

Color After: Colorless Clarity After: Clear Artifacts: _____

Comments:

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00006

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-010190

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44960 SAS No.: _____ SDG No.: MW-020190

Matrix (soil/water): WATER Lab Sample ID: KK2188

Level (low/med): _____ Date Received: 01/17/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				P
7440-38-2	Arsenic				P
7440-39-3	Barium				F
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	26	B		P
7439-92-1	Lead				P
7439-95-4	Magnesium				F
7439-96-5	Manganese	579			P
7439-97-6	Mercury			NE	P
7440-02-0	Nickel				V
7440-09-7	Potassium				P
7782-49-2	Selenium				P
7440-22-4	Silver				F
7440-23-5	Sodium	13,600,000			P
7440-28-0	Thallium				P
7440-62-2	Vanadium				F
7440-66-6	Zinc				P
	Cyanide				P

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

00007

EPA SAMPLE NO.

S-040190

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: TNA44960 SAS No.: _____ SDG No.: MW-020190

Matrix (soil/water): WATER Lab Sample ID: KK2189

Level (low/med): _____ Date Received: 01/17/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	422			P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	14	B	NE	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	9,120,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

00008

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ICP ONLY

Lab Name: ITAS-KNOXVILLE Contract: Coe-Holloman AFB

Lab Code: IT-STU Case No.: ITNA44960 SAS No.: _____ SDG No.: MW-022190

Initial Calibration Source: NBS

Continuing Calibration Source: NBS

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40,000			40,000					P
Antimony	4,000			4,000					P
Arsenic	4,000			4,000					P
Barium	4,000			4,000					P
Beryllium	4,000			4,000					P
Cadmium	4,000			4,000					P
Calcium	40,000			40,000					P
Chromium	4,000			4,000					P
Cobalt	4,000			4,000					P
Copper	4,000			4,000					P
Iron	40,000	43500	108.8	40,000	42500	106.2	40400	101.0	P
Lead	4,000			4,000					P
Magnesium	40,000			40,000					P
Manganese	4,000	3680	92.0	4,000	3710	92.8	3620	90.5	P
Mercury	N/A			N/A					
Nickel	4,000			4,000					P
Potassium	40,000			40,000					P
Selenium	4,000			4,000					P
Silver	4,000			4,000					P
Sodium	40,000	40300	100.8	40,000	40400	101.0	38200	95.5	P
Thallium	4,000			4,000					P
Vanadium	4,000			4,000					P
Zinc	4,000			4,000					P
Cyanide									

1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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00009

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ICP ONLY

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA44960 SAS No.: _____ SDG No.: HW-020190

Initial Calibration Source: NBS

Continuing Calibration Source: NBS

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Found	%R(1)	M
Aluminum	40,000			40,000					P
Antimony	4,000			4,000					P
Arsenic	4,000			4,000					P
Barium	4,000			4,000					P
Beryllium	4,000			4,000					P
Cadmium	4,000			4,000					P
Calcium	40,000			40,000					P
Chromium	4,000			4,000					P
Cobalt	4,000			4,000					P
Copper	4,000			4,000					P
Iron	40,000			40,000	39800	99.5			P
Lead	4,000			4,000					P
Magnesium	40,000			40,000					P
Manganese	4,000			4,000	3680	92.0			P
Mercury	N/A			N/A					
Nickel	4,000			4,000					P
Potassium	40,000			40,000					P
Selenium	4,000			4,000					P
Silver	4,000			4,000					P
Sodium	40,000			40,000	38100	95.2			P
Thallium	4,000			4,000					P
Vanadium	4,000			4,000					P
Zinc	4,000			4,000					P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

2B
CRDL STANDARD FOR AA AND ICP

00010

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44960 SAS No.: _____ SDG No.: HW-02019

AA CRDL Standard Source: NBS

ICP CRDL Standard Source: NBS

Concentration Units: ug/L

Analyte	CRDL Standard for AA True	Found	%R	CRDL Standard for ICP True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony				120	106	88.3	100	83.3
Arsenic	20			* 60	87	145.0	83	138.3
Barium								
Beryllium				10	11	110.0	10	100.0
Cadmium				10	10	100.0	5	50.0
Calcium								
Chromium				20	19	95.0	19	95.0
Cobalt				100	100	100.0	103	103.0
Copper				50	50	100.0	55	110.0
Iron								
Lead	10			* 60	65	108.3	69	115.0
Magnesium								
Manganese				30	31	103.3	32	106.7
Mercury	0.4							
Nickel				80	71	88.8	70	87.5
Potassium								
Selenium	10			* 120	115	95.8	115	95.8
Silver				20	25	125.0	24	120.0
Sodium								
Thallium	20			* 60	51	85.0	45	75.0
Vanadium				100	99	99.0	98	98.0
Zinc				40	45	112.5	44	110.0

*Two times the CRDL is below the instrument detection limit.
Starred elements are at two times the IDL.

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3
BLANKS

00011

Lab Name: ITAS-KNOXVILLE Contract: Case-Holloman AFB

Lab Code: IT-STU Case No.: ITNA44960 SAS No.: _____ SDG No.: MW-020190

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): ug/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	P PBW 01587 F PBW ____ Preparation Blank	C	M
Aluminum											P
Antimony											P
Arsenic											P
Barium											P
Beryllium											P
Cadmium											P
Calcium											P
Chromium											P
Cobalt											P
Copper											P
Iron	10	U	10	U	10	U	10	U	13	B	P
Lead											P
Magnesium											P
Manganese	2	U	2	U	2	U	2	U	2	U	P
Mercury									NR		CV
Nickel											P
Potassium											P
Selenium											P
Silver											P
Sodium	200	U	200	U	200	U	200	U	200	U	P
Thallium											P
Vanadium											P
Zinc											P
Cyanide											CN

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4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS - KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No: ITNA44960 SAS No.: _____ SDG No.: MW-020190

ICP ID Number: JA1100 ICS Source: SPEX

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	493000	483000	461000	469000		427000	431000	
Antimony								
Arsenic								
Barium		485		462	95.3		446	92.0
Beryllium		478		477	99.8		424	88.7
Cadmium		902		899	99.7		898	99.6
Calcium	483000	493000	485000	485000		437000	442000	
Chromium		463		423	91.4		417	90.1
Cobalt		416		430	103.4		428	102.9
Copper		450		410	91.1		421	93.6
Iron	190000	195000	190000	193000		174000	178000	
Lead		881		898	101.9		984	111.7
Magnesium	470000	490000	484000	482000		431000	432000	
Manganese		442		417	98.8		420	950
Mercury								
Nickel		862		831	96.4		825	95.7
Potassium								
Selenium								
Silver		927		941	101.5		941	101.5
Sodium								
Thallium								
Vanadium		443		456	102.9		455	102.7
Zinc		1000		882	88.2		858	85.8

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00013

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: Gse Holloman AFB MW-020190

Lab Code: IT-STU Case No.: TNA44960 SAS No.: _____ SDG No.: MW-02019

Matrix (soil/water): WATER ICAP ONLY Level (low/med): _____

LAB SAMPLE ID KK2185 S

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum						2000			P
Antimony						500			P
Arsenic						2000			P
Barium						2000			P
Beryllium						50			P
Cadmium						50			P
Calcium						NR			P
Chromium						200			P
Cobalt						500			P
Copper						250			P
Iron	75-125	1030		277		1000	75.3		P
Lead						500			P
Magnesium						NR			P
Manganese	75-125	1040		714		500	65.2	Q	P
Mercury						N/A			CV
Nickel						500			P
Potassium						NR			P
Selenium						2000			P
Silver						50			P
Sodium						NR			P
Thallium						2000			P
Vanadium						500			P
Zinc						500			P
Cyanide									

Comments:

U.S. EPA - CLP

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: Coe Hollowman AFB MW-020190

Lab Code: IT-STU Case No.: ITNA4496D SAS No.: _____ SDG No.: MW-02019

Matrix (soil/water): WATER Level (low/med): _____

00014

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									
Antimony									
Arsenic									
Barium									
Beryllium									
Cadmium									
Calcium									
Chromium									
Cobalt									
Copper									
Iron									
Lead									
Magnesium									
Manganese		1030		714		500	63.2		P
Mercury									
Nickel									
Potassium									
Selenium									
Silver									
Sodium									
Thallium									
Vanadium									
Zinc									
Cyanide									

Comments:

U.S. EPA - CLP

00015

6
DUPLICATES
ICAP ONLY

EPA SAMPLE NO.

Lab Name: ITAS-KNOXVILLE Contract: Coe-Holloman AFB MW-020190

Lab Code: IT-STU Case No.: ITNA 44960 SAS No.: _____ SDG No.: MW-02019

Matrix (soil/water): WATER Level (low/med): _____

% Solids for Sample: 0 % Solids for Duplicate: 0

LAB SAMPLE ID KK 2183 OS LAB SAMPLE ID KK 2184 D

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	difference	Q	M
Aluminum								P
Antimony								P
Arsenic								P
Barium								P
Beryllium								P
Cadmium								P
Calcium								P
Chromium								P
Cobalt								P
Copper								P
Iron	±100ug/l	277		262		15		P
Lead								P
Magnesium								P
Manganese	±20%RPD	714		714		0		P
Mercury								V
Nickel								P
Potassium								P
Selenium								P
Silver								P
Sodium	±20%RPD	524000		508000		3.1		P
Thallium								P
Vanadium								P
Zinc								P
Cyanide								

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7

00016

LABORATORY CONTROL SAMPLE

GFAA & CVAA ONLY

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: MNA44960 SAS No.: _____ SDG No.: MW-02019

Solid LCS Source: SPEX

Aqueous LCS Source: SPEX

Analyte	LCSW C1328 Aqueous (ug/L) True	Found	%R	LCSS Solid (mg/kg)* True	Found	C	Limits		%R
Aluminum	20,000	19400	97.0	2,000			1600	2400	
Antimony	4000	3800	95.0	400			320	480	
Arsenic	4000	3910	97.8	400			320	480	
Barium	4000	3800	95.0	400			320	480	
Beryllium	4000	4100	102.5	400			320	480	
Cadmium	4000	4180	104.5	400			320	480	
Calcium	20,000	20800	104.0	2,000			1600	2400	
Chromium	4000	3860	96.5	400			320	480	
Cobalt	4000	3860	96.5	400			320	480	
Copper	4000	3550	88.8	400			320	480	
Iron	20,000	21200	106.0	2,000			1600	2400	
Lead	4000	3720	93.0	400			320	480	
Magnesium	20,000	20300	101.5	2,000			1600	2400	
Manganese	4000	3450	86.2	400			320	480	
Mercury	NR	NR	NR	NR	NR		NR	NR	NR
Nickel	4000	3650	91.2	400			320	480	
Potassium	20,000	19500	97.5	2,000			1600	2400	
Selenium	4000	3720	93.0	400			320	480	
Silver	4000	4020	100.5	400			320	480	
Sodium	20,000	20800	104.0	2,000			1600	2400	
Thallium	4000	3880	97.0	400			320	480	
Vanadium	4000	3690	92.2	400			320	480	
Zinc	4000	3770	94.2	400			320	480	
Cyanide									

* 100ml/1.00g Conversion

ACCEPTANCE LIMITS: 80.0-120.0% except Silver and Antimony

NR = NOT REQUIRED

U.S. EPA - CLP

8

STANDARD ADDITION RESULTS

00017

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA44960 SAS No.: _____ SDG No.: MW-020190

Concentration Units: ug/L

EPA Sample No.	An	Dil	0 ADD CON	1 ADD CON	1 ADD CON	2 ADD CON	2 ADD CON	3 ADD CON	3 ADD CON	Final Conc.	r	Q

NOT APPLICABLE

STANDARD ADDITION RESULTS ARE CALCULATED USING THE SAMPLE CONCENTRATIONS AND NOT THE SAMPLE ABSORBANCES.

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9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

MW-020190

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44960 SAS No.: _____ SDG No.: MW-020190

Matrix (soil/water): WATER Level (low/med): _____

00018

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium							
Cobalt							
Copper							
Iron	277						
Lead							
Magnesium							
Manganese	714		801		12.2	E	P
Mercury							
Nickel							
Potassium							
Selenium							
Silver							
Sodium	524000		572000		9.2		P
Thallium							
Vanadium							
Zinc							

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10
HOLDING TIMES

Lab Name: ITAS-KNOXVILLE Contract: COE-HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA44960 SAS No.: _____ SDG No.: MW-020192

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time

NOT REQUIRED

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00020

11

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: SAS No.: _____ SDG No.: MW-020190

ICP ID Number: JA1100_____ Date: 01/90

Flame AA ID Number : _____

Furnace AA ID Number : _____

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

FORM XI - IN

U.S. EPA - CLP

12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00021

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No.: ITNA44960 SAS No.: _____ SDG No.: MW-220

ICP ID Number: JA1100 Date: 11/89

Analyte	Wave-length (nm)	Interelement Correction Factors for: Al	Ca	Fe	Mg	As
Aluminum	308.2					
Antimony	206.8					
Arsenic	193.6	.0088		.0013		
Barium	493.4					
Beryllium	313.0					
Cadmium	228.8					.005556
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3	.000068				
Magnesium	279.0					
Manganese	357.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0	.00027				
Silver	328.0					
Sodium	588.9					
Thallium	190.8			.00509		
Vanadium	292.4					
Zinc	213.8					

Comments:

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00022

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No.: ITNA44960 SAS No.: _____ SDG No.: MW-[illegible]

ICP ID Number: JA1100 Date: 11/29

Analyte	Wave-length (nm)	Interelement Correction Factors for: Ba	Be	Cd	Co	Cr
Aluminum	308.2					
Antimony	206.8					.00552
Arsenic	193.6	.000666			.00052	
Barium	498.4					
Beryllium	313.0					.00028
Cadmium	228.8		.00433			
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3					
Magnesium	279.0					
Manganese	257.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0					
Silver	328.0			.0001086		
Sodium	588.9					
Thallium	190.8				.00183	
Vanadium	292.4					
Zinc	213.8			.00258		

Comments:

U.S. EPA - CLP

12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00023

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No.: MNA44960 SAS No.: _____ SDG No.: MW-0201

ICP ID Number: JA100 Date: 11/89

Analyte	Wave-length (nm)	Interelement Correction Factors for: Mo	Ni	V	_	_
Aluminum	308.2			.00196		
Antimony	206.8					
Arsenic	193.6			.01282		
Barium	493.4					
Beryllium	313.0		.00012	.00623		
Cadmium	228.8					
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3					
Magnesium	279.0					
Manganese	357.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0					
Silver	328.0	.0001577		.00459		
Sodium	588.9					
Thallium	190.8			.00196		
Vanadium	292.4					
Zinc	213.8		.00326			

Comments:

U.S. EPA - CLP

13

ICP LINEAR RANGES (QUARTERLY)

00024

Lab Name: ITAS_KNOXVILLE_____ Contract: COE HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: MNA 44946 SAS No.: _____ SDG No.: MW-C2019

ICP ID Number: JA1100_____ Date: 01/90

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	P
Antimony	6.00	15000.0	P
Arsenic	6.00	15000.0	P
Barium	6.00	15000.0	P
Beryllium	6.00	15000.0	P
Cadmium	6.00	15000.0	P
Calcium	6.00	500000.0	P
Chromium	6.00	15000.0	P
Cobalt	6.00	15000.0	P
Copper	6.00	40000.0	P
Iron	6.00	500000.0	P
Lead	6.00	40000.0	P
Magnesium	6.00	500000.0	P
Manganese	6.00	40000.0	P
Mercury			NR
Nickel	6.00	15000.0	P
Potassium	6.00	500000.0	P
Selenium	6.00	15000.0	P
Silver	6.00	15000.0	P
Sodium	6.00	900000.0	P
Thallium	6.00	15000.0	P
Vanadium	6.00	12000.0	P
Zinc	6.00	40000.0	P

Comments:

FORM XIII - IN

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

January 30, 1990

Job Number: ITNA 44966

P.O. Number: 301251.02.05

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	01/18/90
Number of Samples:	Six (6)
Sample Type:	Water

I. Introduction

On 01/18/90, six (6) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from International Technology of Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical results before it is reported.

The samples were analyzed for total organic carbon (TOC) in quadruplicate by chemical wet oxidation/infrared detection based on EPA SW-846 method 9060.

The samples were analyzed for phenols by colorimetric determination based on EPA SW-846 method 9065.

The samples were analyzed for the requested anions by ion chromatography using EPA method 300.0.

Reviewed and Approved:

Alyce Moore
Laboratory Manager

RECEIVED
FEB 05 1990
IT CORP.-ALBUQUERQUE

III. Quality Control

Routine laboratory level I QC was followed.

The TOC analyses were performed on 01/23 and 01/24/90. No problems were encountered.

The phenol analyses were performed on 01/24/90. No problems were encountered.

The anion analyses were performed on 01/26/90. No problems were encountered.

International Technology
January 30, 1990

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: COE-Holloman AFB

Job Number: ITNA 44966

TOTAL ORGANIC CARBON ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
MW-010190	KK2205	2
MW-010190	KK2205	1
MW-010190	KK2205	1
MW-010190	KK2205	1
MW-050190	KK2206	5
MW-050190	KK2206	5
MW-050190	KK2206	5
MW-050190	KK2206	5
MW-070190	KK2207	3
MW-070190	KK2207	3
MW-070190	KK2207	3
MW-070190	KK2207	3
MW-080190	KK2208	4
MW-080190	KK2208	4
MW-080190	KK2208	4
MW-080190	KK2208	4
MW-120190	KK2209	1 U
MW-120190	KK2209	1 U
MW-120190	KK2209	1 U
MW-120190	KK2209	1 U
S-020190	KK2210	5
S-020190	KK2210	5
S-020190	KK2210	5
S-020190	KK2210	5
Method Blank	D0374/D0375	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 01/23 and 01/24/90

International Technology
January 30, 1990

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44966

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Chloride	Sulfate
Method Blank	P0850	0.5 U	1.5 U
MW-010190	KK2211	32,000	1,700
MW-050190	KK2212	4,200	2,200
MW-070190	KK2213	1,200	2,200
MW-080190	KK2214	2,800	3,300
MW-120190	KK2215	60,000	4,200
S-020190	KK2216	1,400	2,600
Date Analyzed:		01/26/90	01/26/90

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

International Technology
January 30, 1990

Client Project ID: COE-Holloman AFB

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: ITNA 44966

PHENOLS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID	Lab Sample ID	Result
Method Blank	P0844	0.01 U
MW-010190	KK2223	0.01 U
MW-050190	KK2224	0.01 U
MW-070190	KK2225	0.01 U
MW-080190	KK2226	0.01 U
MW-120190	KK2227	0.01 U
S-020190	KK2228	0.01 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 01/24/90

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology
5301 Central Ave. NE, Suite 700
Albuquerque, NM 87108
ATTN: Dann Meyer

January 25, 1990

Job Number: ITNA 44966

P.O. Number: 301251.02.05

This is the Certificate of Analysis for the following samples:

Client Project ID:	COE-Holloman AFB
Date Received by Lab:	01/18/90
Number of Samples:	Six (6)
Sample Type:	Water

I. Introduction

On 01/18/90, six (6) water samples arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Albuquerque, New Mexico in support of the COE Holloman AFB project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that CLP data are not blank corrected.

The samples were analyzed for the requested metals by inductively coupled plasma spectroscopy (ICP) in accordance with the EPA CLP 7/87 Statement of Work.

III. Quality Control

The samples were digested on 01/22/90 for ICP. The requested metals were analyzed by ICP on 01/23/90. All run QC was acceptable. Associated QC samples were analyzed with ITAS project ITNA 44960, sample MW-020190. No problems were encountered.

Reviewed and Approved:

Alyce Moore

Alyce Moore
Laboratory Manager

U.S. EPA - CLP

00001

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: ITAS-KNOXVILLE Contract: Coe-Holloman AFB

Lab Code: IT-STU Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-010190

SOW No.: 7/87

EPA Sample No.	Lab Sample ID.
MW-010190	KK2217
MW-050190	KK2218
MW-070190	KK2219
MW-080190	KK2220
MW-120190	KK2221
S-020190	KK2222

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

METALS Lab Manager: _____

Date: _____

Data were reported with qualifiers as follows:

"C" Qualifiers

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

"Q" Qualifiers

* - Duplicate analysis outside control limits.
N - Spiked sample recovery outside control limits.
W - Post-digestion spike for GFAA was out of control limits (85-115%), while sample absorbance was less than 50% of spike absorbance.
S - The reported value was determined by method of standard additions.

"M" Qualifiers

P - Analysis performed by ICP.
V - Analysis performed by CVAA.
F - Analysis performed by GFAA.
C - Cyanide analysis by manual distillation/colorimetric determination.

Miscellaneous

D - Duplicate.
S - Spike.
NR - Not required.
G - Native analyte > 4 times spike added, therefore, acceptance criteria do not apply
X - Detection limits higher than normal due to sample matrix interferences.

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-010190

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-010190

Matrix (soil/water): WATER Lab Sample ID: KK2217

Level (low/med): _____ Date Received: 01/18/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	426			P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	28		E	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	7,000,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: Colorless Clarity Before: Clear Texture: _____

Color After: Colorless Clarity After: Clear Artifacts: _____

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-050190

Lab Name: ITAS-KNOXVILLE Contract: Cde Holloman AFB

Lab Code: ITSTU Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-010190

Matrix (soil/water): WATER Lab Sample ID: KK2218

Level (low/med): _____ Date Received: 01/18/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	453			P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	2080		E	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	4580,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: Colorless Clarity Before: Clear Texture: _____

Color After: Colorless Clarity After: Clear Artifacts: _____

Comments:

U.S. EPA - CLP

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-070190

Lab Name: TMAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: TMSTU Case No.: MNA44966 SAS No.: _____ SDG No.: MW-010190

Matrix (soil/water): WATER Lab Sample ID: KK2219

Level (low/med): _____ Date Received: 01/18/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	138			P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	828		F	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	552000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

00006

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-080190

Lab Name: TMAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: TM-STU Case No.: MNA44966 SAS No.: _____ SDG No.: MW-010190

Matrix (soil/water): WATER Lab Sample ID: KK2220

Level (low/med): _____ Date Received: 01/18/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	666	B		P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	469		E	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	1430000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: Colorless Clarity Before: Clear Texture: _____

Color After: Colorless Clarity After: Clear Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW-120190

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-010190

Matrix (soil/water): WATER Lab Sample ID: KK2221

Level (low/med): _____ Date Received: 01/18/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				
7440-36-0	Antimony				P
7440-38-2	Arsenic				P
7440-39-3	Barium				F
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	617			P
7439-92-1	Lead				P
7439-95-4	Magnesium				F
7439-96-5	Manganese	30		E	P
7439-97-6	Mercury				P
7440-02-0	Nickel				V
7440-09-7	Potassium				P
7782-49-2	Selenium				P
7440-22-4	Silver				F
7440-23-5	Sodium	7,380,000			P
7440-28-0	Thallium				P
7440-62-2	Vanadium				F
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

00008

EPA SAMPLE NO.

S-020190

Lab Name: ITAS-KNOXVILLE Contract: Coe Hollomon MB

Lab Code: IT-STU Case No.: HNA44966 SAS No.: _____ SDG No.: HW-010190

Matrix (soil/water): WATER Lab Sample ID: HK2222

Level (low/med): _____ Date Received: 01/18/90

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				P
7440-36-0	Antimony				P
7440-38-2	Arsenic				F
7440-39-3	Barium				P
7440-41-7	Beryllium				P
7440-43-9	Cadmium				P
7440-70-2	Calcium				P
7440-47-3	Chromium				P
7440-48-4	Cobalt				P
7440-50-8	Copper				P
7439-89-6	Iron	705			P
7439-92-1	Lead				F
7439-95-4	Magnesium				P
7439-96-5	Manganese	109		E	P
7439-97-6	Mercury				V
7440-02-0	Nickel				P
7440-09-7	Potassium				P
7782-49-2	Selenium				F
7440-22-4	Silver				P
7440-23-5	Sodium	707,000			P
7440-28-0	Thallium				F
7440-62-2	Vanadium				P
7440-66-6	Zinc				P
	Cyanide				

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments:

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00009

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ICP ONLY

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-010190

Initial Calibration Source: NBS

Continuing Calibration Source: NBS

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	40,000			40,000					P
Antimony	4,000			4,000					P
Arsenic	4,000			4,000					P
Barium	4,000			4,000					P
Beryllium	4,000			4,000					P
Cadmium	4,000			4,000					P
Calcium	40,000			40,000					P
Chromium	4,000			4,000					P
Cobalt	4,000			4,000					P
Copper	4,000			4,000					P
Iron	40,000	43500	108.8	40,000	42500	106.2	40400	101.0	P
Lead	4,000			4,000					P
Magnesium	40,000			40,000					P
Manganese	4,000	3680	92.0	4,000	3710	92.8	3620	90.5	P
Mercury	N/A			N/A					
Nickel	4,000			4,000					P
Potassium	40,000			40,000					P
Selenium	4,000			4,000					P
Silver	4,000			4,000					P
Sodium	40,000	40300	100.8	40,000	40400	101.0	38200	95.5	P
Thallium	4,000			4,000					P
Vanadium	4,000			4,000					P
Zinc	4,000			4,000					P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

ICP ONLY

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44966 SAS No.: _____ SDG No.: MW-010190

Initial Calibration Source: NBS

Continuing Calibration Source: NBS

Concentration Units: ug/L

Analyte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
Aluminum	40,000			40,000					P
Antimony	4,000			4,000					P
Arsenic	4,000			4,000					P
Barium	4,000			4,000					P
Beryllium	4,000			4,000					P
Cadmium	4,000			4,000					P
Calcium	40,000			40,000					P
Chromium	4,000			4,000					P
Cobalt	4,000			4,000					P
Copper	4,000			4,000					P
Iron	40,000			40,000	39800	99.5			P
Lead	4,000			4,000					P
Magnesium	40,000			40,000					P
Manganese	4,000			4,000	3680	92.0			P
Mercury	N/A			N/A					
Nickel	4,000			4,000					P
Potassium	40,000			40,000					P
Selenium	4,000			4,000					P
Silver	4,000			4,000					P
Sodium	40,000			40,000	38100	95.2			P
Thallium	4,000			4,000					P
Vanadium	4,000			4,000					P
Zinc	4,000			4,000					P
Cyanide									

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

2B

CRDL STANDARD FOR AA AND ICP

00011

Lab Name: ITAS-KNOXVILLE Contract: Cos Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44966 SAS No.: _____ SDG No.: MW-01019

AA CRDL Standard Source: NBS

ICP CRDL Standard Source: NBS

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
					Initial		Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony				120	106	88.3	100	83.3
Arsenic	20			* 60	87	145.0	83	138.3
Barium								
Beryllium				10	11	110.0	10	100.0
Cadmium				10	10	100.0	5	50.0
Calcium								
Chromium				20	19	95.0	19	95.0
Cobalt				100	100	100.0	103	103.0
Copper				50	50	100.0	55	110.0
Iron								
Lead	10			* 60	65	108.3	69	115.0
Magnesium								
Manganese				30	31	103.3	32	106.7
Mercury	0.4							
Nickel				80	71	88.8	70	87.5
Potassium								
Selenium	10			* 120	115	95.8	115	95.8
Silver				20	25	125.0	24	120.0
Sodium								
Thallium	20			* 60	51	85.0	45	75.0
Vanadium				100	99	99.0	98	98.0
Zinc				40	45	112.5	44	110.0

*Two times the CRDL is below the instrument detection limit.
Starred elements are at two times the IDL.

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3
BLANKS

00012

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA44966 SAS No.: _____ SDG No.: HW-010190

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	P PBW C1327 F PBW ____ Preparation Blank	C	M
Aluminum											P
Antimony											P
Arsenic											P
Barium											P
Beryllium											P
Cadmium											P
Calcium											P
Chromium											P
Cobalt											P
Copper											P
Iron	10	U	10	U	10	U	10	U	13	B	P
Lead											P
Magnesium											P
Manganese	2	U	2	U	2	U	2	U	2	U	P
Mercury									NR		CV
Nickel											P
Potassium											P
Selenium											P
Silver											P
Sodium	200	U	200	U	200	U	200	U	200	U	P
Thallium											P
Vanadium											P
Zinc											P
Cyanide											CN

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4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS-KNOXVILLE Contract: Cos Holloman AFB

Lab Code: IT STU Case No: ITNA449 SAS No.: _____ SDG No.: MW-0[illegible]

ICP ID Number: JA1100 ICS Source: SPEX

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	493000	483000	466000	469000		427000	431000	
Antimony								
Arsenic								
Barium		485		462	95.3		446	92.0
Beryllium		478		477	99.8		424	88.7
Cadmium		902		899	99.7		898	99.6
Calcium	483000	493000	485000	485000		437000	442000	
Chromium		463		423	91.4		417	90.1
Cobalt		416		430	103.4		428	102.9
Copper		450		410	91.1		421	93.6
Iron	190000	195000	190000	193000		174000	178000	
Lead		881		898	101.9		984	111.7
Magnesium	470000	490000	484000	482000		431000	432000	
Manganese		442		417	98.8		420	95.0
Mercury								
Nickel		862		831	96.4		825	95.7
Potassium								
Selenium								
Silver		927		941	101.5		941	101.5
Sodium								
Thallium								
Vanadium		443		456	102.9		455	102.7
Zinc		1000		882	88.2		858	85.8

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7

LABORATORY CONTROL SAMPLE

00014

GFAA & CVAA ONLY

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA4496 SAS No.: _____ SDG No.: MW-0101

Solid LCS Source: SPEX

Aqueous LCS Source: SPEX

Analyte	LCSW C1328 Aqueous (ug/L) True	Found	%R	LCSS Solid (mg/kg)* True	Found	C	Limits		%R
Aluminum	20,000	19400	97.0	2,000			1600	2400	
Antimony	4000	3800	95.0	400			320	480	
Arsenic	4000	3910	97.8	400			320	480	
Barium	4000	3800	95.0	400			320	480	
Beryllium	4000	4100	102.5	400			320	480	
Cadmium	4000	4180	104.5	400			320	480	
Calcium	20,000	20800	104.0	2,000			1600	2400	
Chromium	4000	3860	96.5	400			320	480	
Cobalt	4000	3860	96.5	400			320	480	
Copper	4000	3550	88.8	400			320	480	
Iron	20,000	21200	106.0	2,000			1600	2400	
Lead	4000	3720	93.0	400			320	480	
Magnesium	20,000	20300	101.5	2,000			1600	2400	
Manganese	4000	3450	86.2	400			320	480	
Mercury	NR	NR	NR	NR	NR		NR	NR	NR
Nickel	4000	3650	91.2	400			320	480	
Potassium	20,000	19500	97.5	2,000			1600	2400	
Selenium	4000	3720	93.0	400			320	480	
Silver	4000	4020	100.5	400			320	480	
Sodium	20,000	20800	104.0	2,000			1600	2400	
Thallium	4000	3880	97.0	400			320	480	
Vanadium	4000	3690	92.2	400			320	480	
Zinc	4000	3770	94.2	400			320	480	
Cyanide									

* 100ml/1.00g Conversion

ACCEPTANCE LIMITS: 80.0-120.0% except Silver and Antimony

NR = NOT REQUIRED

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8

STANDARD ADDITION RESULTS

00015

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman AFB

Lab Code: IT-STU Case No.: ITNA 44966 SAS No.: _____ SDG No.: HW-010190

Concentration Units: ug/L

EPA Sample No.	An	Dil	0 ADD CON	1 ADD CON	1 ADD CON	2 ADD CON	2 ADD CON	3 ADD CON	3 ADD CON	Final Conc.	r	Q

NOT APPLICABLE

STANDARD ADDITION RESULTS ARE CALCULATED USING THE SAMPLE CONCENTRATIONS AND NOT THE SAMPLE ABSORBANCES.

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9

ICP SERIAL DILUTIONS

00016

EPA SAMPLE NO.

MW-070190

Lab Name: ITAS-KNOXVILLE Contract: Coe Holloman

Lab Code: IT-STU Case No.: ITNA 44946 SAS No.: _____ SDG No.: MW010190

Matrix (soil/water): WATER Level (low/med): _____

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum							
Antimony							
Arsenic							
Barium							
Beryllium							
Cadmium							
Calcium							
Chromium							
Cobalt							
Copper							
Iron							
Lead							
Magnesium							
Manganese	828		920		11.1	E	P
Mercury							
Nickel							
Potassium							
Selenium							
Silver							
Sodium	552000		575000		4.2		P
Thallium							
Vanadium							
Zinc							

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10
HOLDING TIMES

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT-STU Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-01019

EPA Sample No.	Matrix	Date Received	Mercury Prep Date	Mercury Holding Time	Cyanide Prep Date	Cyanide Holding Time

NOT REQUIRED

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: ITAS_KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: ITSTU Case No.: ITNA449666 SAS No.: SDG No.: MW-010190

ICP ID Number: JA1100 Date: 1/90

Flame AA ID Number :

Furnace AA ID Number :

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	40.0	P
Antimony	206.80		60	30.0	P
Arsenic	193.60		10	30.0	P
Barium	493.40		200	2.0	P
Beryllium	313.00		5	1.0	P
Cadmium	228.80		5	5.0	P
Calcium	317.90		5000	30.0	P
Chromium	267.70		10	10.0	P
Cobalt	228.60		50	20.0	P
Copper	324.70		25	10.0	P
Iron	259.90		100	10.0	P
Lead	220.30		5	30.0	P
Magnesium	279.00		5000	30.0	P
Manganese	257.60		15	2.0	P
Mercury			0.2		NR
Nickel	231.60		40	20.0	P
Potassium	766.00		5000	1000.0	P
Selenium	196.00		5	60.0	P
Silver	328.00		10	5.0	P
Sodium	588.90		5000	200.0	P
Thallium	190.80		10	30.0	P
Vanadium	292.40		50	10.0	P
Zinc	213.80		20	5.0	P

Comments:

FORM XI - IN

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12A

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY) 00019

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No.: ITNA 449660 SAS No.: _____ SDG No.: HW-010F

ICP ID Number: JA1100 Date: 11/89

Analyte	Wave-length (nm)	Interelement Correction Factors for: Al	Ca	Fe	Mg	As
Aluminum	308.2					
Antimony	206.8					
Arsenic	193.6	.0088		.0013		
Barium	493.4					
Beryllium	313.0					
Cadmium	228.8					.00556
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3	.00068				
Magnesium	279.0					
Manganese	257.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0	.00027				
Silver	328.0					
Sodium	588.9					
Thallium	190.8			.00509		
Vanadium	292.4					
Zinc	213.8					

Comments:

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12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00020

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-010

ICP ID Number: JA1100 Date: 11/29

Analyte	Wave-length (nm)	Interelement Correction Factors for: Ba	Be	Cd	Co	Cr
Aluminum	308.2					
Antimony	206.8					.00558
Arsenic	193.6	.000666			.00052	
Barium	493.4					
Beryllium	313.0					.00028
Cadmium	228.8		.00433			
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3					
Magnesium	279.0					
Manganese	257.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0					
Silver	328.0			.0001026		
Sodium	588.9					
Thallium	190.8				.00183	
Vanadium	292.4					
Zinc	213.8			.00238		

Comments:

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12B

ICP INTERELEMENT CORRECTION FACTORS (QUARTERLY)

00021

Lab Name: ITAS-KNOXVILLE Contract: COE HOLLOMAN AFB

Lab Code: IT STU Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-010A

ICP ID Number: JA1100 Date: 11/89

Analyte	Wave-length (nm)	Interelement Correction Factors for: Mo	Ni	V	_	_
Aluminum	308.2			.00196		
Antimony	206.8					
Arsenic	193.6			.01282		
Barium	493.4					
Beryllium	313.0		.00012	.00623		
Cadmium	228.8					
Calcium	317.9					
Chromium	267.7					
Cobalt	228.6					
Copper	324.7					
Iron	259.9					
Lead	220.3					
Magnesium	279.0					
Manganese	357.6					
Mercury						
Nickel	231.6					
Potassium	766.4					
Selenium	196.0					
Silver	328.0	.0001577		.00459		
Sodium	588.9					
Thallium	190.8			.00196		
Vanadium	292.4					
Zinc	213.8		.00926			

Comments:

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00022

13

ICP LINEAR RANGES (QUARTERLY)

Lab Name: ITAS_KNOXVILLE_____ Contract: COE HOLLOMAN AFB

Lab Code: ITSTU_____ Case No.: ITNA44966 SAS No.: _____ SDG No.: MW-010190

ICP ID Number: JA1100_____ Date: 1/90

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Aluminum	6.00	500000.0	P
Antimony	6.00	15000.0	P
Arsenic	6.00	15000.0	P
Barium	6.00	15000.0	P
Beryllium	6.00	15000.0	P
Cadmium	6.00	15000.0	P
Calcium	6.00	500000.0	P
Chromium	6.00	15000.0	P
Cobalt	6.00	15000.0	P
Copper	6.00	40000.0	P
Iron	6.00	500000.0	P
Lead	6.00	40000.0	P
Magnesium	6.00	500000.0	P
Manganese	6.00	40000.0	P
Mercury			NR
Nickel	6.00	15000.0	P
Potassium	6.00	500000.0	P
Selenium	6.00	15000.0	P
Silver	6.00	15000.0	P
Sodium	6.00	900000.0	P
Thallium	6.00	15000.0	P
Vanadium	6.00	12000.0	P
Zinc	6.00	40000.0	P

Comments:

FORM XIII - IN

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INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED
FEB 16 1990
IT CORP.-ALBUQUERQUE

CERTIFICATE OF ANALYSIS

IT Corporation
5301 Central Avenue NE
Suite 700
Albuquerque, New Mexico 87108
Attn: Mr. Dann Meyer

Date: February 15, 1990

Job Number PN 3003-375

P.O. Number: 90-090

This is the Certificate of Analysis for the following samples:

Client Project ID:	Holloman AFB
Date Received by Lab:	December 14, 1989, January 17 and January 18, 1990
Work Order:	T9-12-123, X0-01-181 and X0-01-192
Number of Samples:	16
Sample Type:	Water

I. Introduction

Sixteen water samples arrived at ITAS Cincinnati from December 14, 1989 to January 18, 1990. The samples were sent for analytical work in support of monitoring work at the Holloman AFB. The samples were labeled as follows:

Water # MW-011289	Water # MW-060190	Water # MW-080190
Water # MW-121289	Water # MW-040190	Water # S -020190
Water # MW-081289	Water # S -040190	Water # MW-010190
Water # S-021289	Water # MW-110190	Water # MW-120190
	Water # MW-030190	Water # MW-050190
	Water # MW-020190	Water # MW-070190

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information, the analytical results, and the appropriate detection limits. The analyses requested include purgeable organic halides by EPA SW846 Method 9021; arsenic by gaseous hydride atomic absorption using EPA SW846 Method 7061; and selenium by gaseous hydride atomic absorption using EPA SW846 Method 7741. The POX analyses were performed at the ITAS Oak Ridge laboratory. The metals were analyzed at ITAS Cincinnati.

Reviewed and Approved by:

Craig H. Caldwell
Laboratory Manager
CHC126 T9-12-123

III. Quality Control

Immediately following the analytical data for the samples can be found the QA/QC information that pertains to these samples. The purpose of this information is to demonstrate that the data enclosed is scientifically valid and defensible. This QA/QC data is used to assess the laboratory's performance during the analysis of the samples it accompanies. All quantitations were performed from within the calibrated range of the analytical instrument.

IV. Comments

Twelve of the samples for POC were analyzed in quadruplicate as the request for analyses received with the samples specified.

Client: Holloman AFB
Work Order: T9-12-123, X0-01-181 and X0-01-192
CHC127

IT ANALYTICAL SERVICES
CINCINNATI, OH

Client ID	Lab No.	POX, mg/L
Water # MW-011289	123-01	ND
		ND
		ND
		ND
Water # MW-121289	123-02	ND
Water # MW-081289	123-03	ND
Water # S-021289	123-04	ND
		ND
		ND
		ND

Detection Limit = 0.010 mg/L

ND = Not Detected

Client: Holloman AFB
Work Order: T9-12-123, X0-01-181 and X0-01-192
CHC128

IT ANALYTICAL SERVICES
CINCINNATI, OH

Client ID	Lab No.	POX, mg/L
Water # MW-060190	181-01	ND
		ND
		ND
		ND
Water # MW-040190	181-02	ND
		ND
		ND
		ND
Water # S-040190	181-03	ND
		ND
		ND
		ND
Water # MW-110190	181-04	ND
Water # MW-030190	181-05	ND
		ND
		ND
		ND
Water # MW-020190	181-06	ND
		ND
		ND
		ND

Detection Limit = 0.010 mg/L

ND = Not Detected

Client: Holloman AFB
Work Order: T9-12-123, X0-01-181 and X0-01-192
CHC129

IT ANALYTICAL SERVICES
CINCINNATI, OH

Client ID	Lab No.	POX, mg/L
Water # MW-080190	192-01	ND
		ND
		ND
		ND
Water # S-020190	192-02	ND
		ND
		ND
		ND
Water # MW-010190	192-03	ND
		ND
		ND
		ND
Water # MW-120190	192-04	ND
		ND
		ND
		ND
Water # MW-050190	192-05	ND
		ND
		ND
		ND
Water # MW-070190	192-06	ND

Detection Limit = 0.010 mg/L

ND = Not Detected

Client: Holloman AFB
Work Order: T9-12-123, X0-01-181 and X0-01-192
CHC130

IT ANALYTICAL SERVICES
CINCINNATI, OH

Sample ID	Lab No.	Arsenic ug/L	Selenium ug/L
Water # MW-011289	123-01	9.3	2.8
Water # MW-121289	123-02	9.9	4.6
Water # MW-081289	123-03	1.6	0.35
Water # S-021289	123-04	1.5	ND
Detection Limit		0.3	0.3

ND = Not Detected

Quality Control Results
Standard Reference Solutions

Analyte	Theoretical Value, mg/L	Percent Recovery
Arsenic	0.0075	98.1
Selenium	0.0075	91.3

All recoveries are within acceptable limits.

APPENDIX E

A-E DAILY QUALITY CONTROL REPORTS

Project No 301251 02.0

Date: 012590

Sheet No.: 016

Page 1 of 1

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 5th Round. Begin Detection Monitoring: Annual and Semi-Annual Parameters Wastewater Treatment Lagoons.

Weather: Warm, slightly cloudy, high temperature of ~65 F Slight breeze from west.

Work Performed: At 10 monitor wells (RCRA): ① Monitor background and wellbore headspace with HNu Photoionization Detector for presence of volatile organic compounds; ② Measure depth to fluids and total well depth using an ORS interface probe. - No immissible phases detected in any monitor wells. All down-hole equipment deconned between monitor wells.

Sampling Performed: NA

Problems and Corrective Actions: NA

Quality Control Activities Initiated: Field Equipment was calibrated before and after use. POX trip blank was maintained on ice under chain of custody procedures.

Signature: Ann M Houska, IT Corp. - ABQ.

Project No. 301251.02.05

Date: 011690

Sheet No.: 017

Page 1 of 1

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 5th Round. Begin Detection Monitoring (RCRA): Annual and Semi-Annual Parameters. Wastewater Treatment Lagoons.

Weather: Dark clouds present throughout day. Low temp. of ~35°F. High ~59°F. Minor showers throughout day. Slight winds.

Work Performed: Equipment Calibration; Purge (5 casing volumes) and Sample 5 monitor wells; Package samples for shipment. Note - reduced parameters from "background monitoring". Four replicates of pH, S. Conductance, TOX and POX measured/collected at each (10) monitor well.

Sampling Performed: Monitor Wells: MW-6, S-4, MW-4, MW-3 and MW-2.

Problems and Corrective Actions: NA

Quality Control Activities Initiated: Field equipment calibrated daily before + after field use. A POX trip blank, provided by ITAS-Cinc. was present in field + returned to ITAS-Cinc along with other POX samples. All samples were maintained under Chain of Custody procedures.

Signature: Ann M Houska, 1Lt-ABQ

Project No 301251 02-05

Date: 011790

Sheet No.: 013

Page 1 of 1

A-E DAILY QUALITY CONTROL REPORT FOR GROUNDWATER MONITORING
HOLLOMAN AFB, NEW MEXICO

Task/Site No.: 5th Round – Begin Detection Monitoring (RCRA): Annual and Semi-Annual Parameters. Wastewater Treatment Lagoons.

Weather: Sunny, Clear. Low temperature ~ 30°F, high of ~ 60°F. Slight breeze from west.

Work Performed: Equipment Calibration; Purge (5 casing volumes) and sample 5 monitor wells; Package samples for shipment

Sampling Performed: Monitor Wells: MW-8; S-2; MW-1; MW-5 and MW-7. QA samples collected for COE-Missouri River Div Lab. analysis at MW-8 and MW-1. One environmental duplicate collected at MW-1.

Problems and Corrective Actions: NA

Quality Control Activities Initiated: Field equipment calibrated daily before + after field use. An environmental duplicate was collected at MW-1. Two COE-QA samples were collected for analysis by COE-Missouri River Div. Lab. at MW-8 and MW-1. All samples were maintained under Chain of Custody procedures.

Signature: Ann Hruska, IT-ABQ

RADIAN
CORPORATION

DCN 90-269-004-01-01

8501 Mo-Pac Blvd.
P.O. Box 201088
Austin, TX 78720-1088
(512)454-4797

SUMMARY REPORT FOR ADDITIONAL SAMPLES COLLECTED DURING THE FIRST QUARTER OF GROUNDWATER SAMPLING AT HOLLOMAN AIR FORCE BASE, NM

Under contract with:

Department of the Army
Omaha District, Corps of Engineers
Executive Building
1624 Douglas, Room 608
Omaha, Nebraska 68102

Prepared for:

Headquarters, Tactical Air Command
HQ, TAC/DEEV
Langley AFB, Virginia 23665

Prepared by:

Radian Corporation
8501 Mo-Pac Boulevard
P.O. Box 201088
Austin, Texas 78720-1088

May 1990

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APPENDIX A--Analytical Data

APPENDIX B--Quality Control Results

1.0 INTRODUCTION

Radian Corporation, under contract No. DACA45-86-D-0052 with the Omaha District, U.S. Army Corps of Engineers (USACE), developed and implemented a Groundwater Monitoring Plan (GWMP, Radian, July 1989) for the sewage lagoons at Holloman Air Force Base. Field activities conducted during July and August 1989 included installation of the detection monitoring well network, completion of the first quarter of groundwater sampling and analysis, and documentation of field activities and analytical results.

At the request of the USACE Project Manager, Radian collected additional samples from each monitoring well for a more detailed analysis to document existing groundwater conditions at the sewage lagoon site. Groundwater samples were analyzed to determine the presence or absence of selected compounds suspected to have been discharged to the sewage lagoon system in the past. Samples were analyzed by the following methods in accordance with SW-846 protocol (U.S. EPA, September 1986):

- EPA Method 8240 for volatile organic compounds by gas chromatography/mass spectroscopy (GC/MS);
- EPA Method 8270 for semivolatile organic compounds by GC/MS;
- Metals by inductively coupled plasma emission spectroscopy (ICPES) and atomic absorption spectroscopy (AAS);
- EPA Method 8080 for pesticides and polychlorinated biphenyls (PCBs) by gas chromatography/electron capture detection (GC/ECD); and
- EPA Method 8150 for herbicides by GC/ECD.

This report documents results of the additional sampling. Section 2 presents a summary of the laboratory data. Section 3 presents a discussion of

2.0 SUMMARY OF ANALYTICAL RESULTS

This section presents a summary of the analytical results by test method. Raw data are contained in Appendix A.

EPA Method 8240

The following volatile organic compounds were detected in the groundwater samples:

- Methylene chloride at concentrations ranging from 1.1 to 3.4 ppb;
- Acetone at concentrations ranging from 3.2 to 4.5 ppb; and
- Chlorobenzene at a concentration of 2.9 ppb.

Methylene chloride and acetone were detected in the reagent blanks and/or detected at values less than the detection limit. Analysis of the QC data (see Section 3.1) suggests that the presence of these compounds is a result of laboratory contamination. Chlorobenzene was detected in one sample at a value less than the detection limit.

EPA Method 8270

The following semivolatile organic compounds were detected in the groundwater samples:

- Di-n-butylphthalate at concentrations ranging from 1.4 to 11 ppb;
- Bis(2-ethylhexyl)phthalate at concentrations of 2.1 and 2.3 ppb;
- Diethylphthalate at a concentration of 1.1 ppb; and
- Phenol at concentrations of 1.1 and 1.6 ppb.

The phthalate compounds were present in the reagent blanks or at levels below the detection limit. Analysis of the QC data (see Section 3.2) suggests that the presence of these compounds is a result of laboratory

TABLE 2-1. RESULTS OF EPA METHOD 8080 ANALYSES

Well ID	PCB-1260 (μg/L)	Detection Limit (μg/L)
MW-2	1.1 C	0.80
MW-3	1.0 C	0.80
MW-4	10 C	1.9
MW-4 (duplicate)	11 C	1.8
MW-7	0.88 C	0.80
MW-8	1.0 C	0.80

Notes:

μg/L equivalent to parts per billion (ppb).

C indicates confirmed on second column.

3.0 SUMMARY OF QUALITY CONTROL ACTIVITIES

This section presents a detailed description of quality control procedures implemented to ensure data reliability. Quality control results are summarized in tables contained in Appendix B. Quality control activities included field and reagent blank analyses, field and laboratory duplicate analyses, surrogate spike analyses, and matrix spike analyses.

3.1 Volatile Organic Analyses

Groundwater samples were analyzed for volatile organic compounds by SW-846 Method 8240. Quality control activities included field and trip blank analyses, laboratory blank analyses, surrogate spike analyses, matrix spike analyses, field duplicate analyses, and matrix spike duplicate analyses. The presence of low levels of methylene chloride in field samples is probably due to laboratory contamination. No other major problems were noted with these analyses.

Results for field and trip blank analyses are presented in Table B-1. Methylene chloride was detected in the field blank analyzed with these samples. The concentration was 3.1 μg/L, slightly above the detection limit of 2.8 μg/L. Methylene chloride was also detected in two of the three reagent blanks analyzed with these samples. Nothing was detected in the trip blank. The low levels of methylene chloride detected in the field samples are probable due to laboratory contamination. No other problems were noted with these analyses.

Results for reagent blanks analyzed by Method 8240 are presented in Table B-2. In two of the three reagent blanks, methylene chloride was detected at 1.6 μg/L and 2-hexanone was detected at 3.9 μg/L and 1.5 μg/L. These values are below the detection limits of 2.8 μg/L and 36 μg/L, respectively. Acetone was detected at 3.5 μg/L in one of three reagent blanks. This value is below the detection limit of 7.5 μg/L. No other problems were noted with these analyses.

Both compounds were detected, at comparable concentrations, in the two reagent blanks analyzed with these samples. Results for reagent blanks are presented in Table B-8. These blank results suggest that field sample concentrations are probably due to laboratory contamination.

Surrogate spike recoveries for Method 8270 are presented in Table B-9. Of the fourteen samples analyzed, the mean recovery for the six surrogate compounds is within acceptance criteria. Two of the individual recoveries for 2-fluorophenol and phenol-d_5 were above the acceptance criteria specified in the method. These recoveries do not suggest any trends or bias in the data. No major problems were noted.

Matrix spike results for Method 8270 are presented in Table B-10. Three recoveries of the eleven surrogate compounds spiked into two samples were outside of acceptance criteria. Recoveries for 4-nitrophenol (124 and 147 percent) were above the acceptance criteria of 10 - 80 percent recovery. Recovery for 2,4-dinitrotoluene (102 percent) was slightly above the acceptance criteria of 24 - 96 percent recovery. High recoveries for three of twenty-two compounds does not suggest any trends or biases in the field data.

Results for field duplicate samples are presented in Table B-11. Nothing was detected in either sample at greater than five times the detection limit. Therefore, no conclusions can be drawn using this data.

Matrix spike duplicate results are presented in Table B-12. Variability, as measured by RPD, was within acceptance criteria for all eleven matrix spike compounds. No problems were noted with this data.

3.3 Metals Analyses

Groundwater samples were digested using EPA Method 3005 and analyzed by inductively coupled plasma emission spectroscopy (ICPES) or by atomic absorption spectroscopy (AAS). Method 3005 is a digestion method for recoverable metals. Arsenic, mercury, lead, and selenium were analyzed by AAS. All other metals were analyzed by ICPES. Arsenic, potassium, lead, selenium, and

Matrix spike duplicate results are presented in Table B-17. Variability as measured by RPD was within acceptance criteria for all metals except for potassium.

3.4 Pesticide and PCB Analyses

Groundwater samples were analyzed for pesticides and PCBs by SW-846 Method 8080. Quality control activities included analysis of reagent blanks, field blanks, surrogate spikes, and field replicates. Matrix spike samples and matrix spike duplicate samples were not analyzed. Precision was based on field replicate results. Accuracy was based on surrogate results. There were no problems associated with these analyses.

Reagent blank results are presented in Table B-18. Nothing was detected in either reagent blank. No problems were noted with these analyses.

Field blank results are presented in Table B-19. Nothing was detected in the field blank. There were no problems with these analyses.

Surrogate spike results are presented in Table B-20. All recoveries were within acceptance criteria for these analyses. The mean percent recovery was 91 percent;, the standard deviation was 20 percent. There were no problems with these analyses.

Field replicate results are presented in Table B-22. Two samples from well MW-4 and three samples from well MW-2 were analyzed. PCB-1260 was detected in both samples from MW-4. Repeatability as measured by relative percent difference (RPD) was 10 percent, which is within the acceptance criteria of <50 percent. PCB-1260 was detected at 1.1 μg/L in one of three samples from well MW-2. This level is slightly above the detection limit of 0.8 μg/L. PCB-1260 was not present above the detection limit of 0.8 μg/L in two replicate samples for MW-2. Concentratinos near the detection limit are more likely to be variable and, in general, repeatability for this analysis is considered good.

APPENDIX A

Analytical Data

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-214

Received: 08/19/89 09/08/89 12:49:20

REPORT TO: Radian Corporation
8501 MoPac Blvd
Austin, TEXAS 78766

ATTEN: Karen Achord

CLIENT: HOLLOMAN AFB SAMPLES: 14
COMPANY: Radian Corporation
FACILITY: 8501 MoPac Blvd.
Austin, TEXAS 78766

WORK ID: SEWAGE LAGOONS; CN, REC. METALS
TAKEN: 8/17, 18/89
TRANS: Fedex 2301177071, 060, 104, 093
TYPE: Groundwater
P.O. #: 269-001-01-20
INVOICE: under separate cover

PREPARED BY: Radian Analytical Services
10395 Old Placerville Road
Sacramento,
California 95827

ATTEN:
PHONE: 916-362-5332

CERTIFIED BY: Paul N Hale

CONTACT: KLACHORD

Rec. Metals to be digested by EPA Method 3005

SAMPLE IDENTIFICATION

01	MW-3-1 H20
02	MW-1-1a H20
03	MW-4-1a H20
04	MW-4-1b H20
05	MW-5-1a H20
06	MW-7-1 H20
07	MW-8-1 H20
08	MW-6-1 H20
09	MW-2-1a H20
09	MW-2-1b MS H20
09	MW-2-1c MSD H20
09	MW-2-1a H20
09	MW-2-1b MS H20
09	MW-2-1c MSD H20
10	S-2-1a H20
11	S-2-1b H20
12	S-4-1 H20
13	REAGENT BLANK H20
14	REAGENT BLANK H20

TEST CODES and NAMES used on this report

301SWS	Digestion by Method 3010
302SWS	Digestion by Method 3020
AG EM	Silver by EM-EPA 200.7
AL EM	Aluminum, ICPES, EPA-200.7
AS GF	Arsenic, low level-EPA206.2
BA EM	Barium, ICPES, EPA-200.7
BE EM	Beryllium, ICPES, -EPA 200.7
CA EM	Calcium, ICPES, EPA-200.7
CD EM	Cadmium by EM-EPA 200.7
CN TOT	Total Cyanide
CO EM	Cobalt, ICPES, EPA-200.7
CR EM	Chromium by EM-EPA 200.7
CU EM	Copper by EM-EPA 200.7
FE EM	Iron, ICPES, EPA-200.7
HG CV	Mercury COLD VAP. EPA-245.1
K EM	Potassium by ICPES(E200.7)
MG EM	Magnesium, ICPES, EPA-200.7
MN EM	Manganese, ICPES, EPA-200.7
NA EM	Sodium , ICPES, EPA-200.7
NI EM	Nickel by EM-EPA 200.7
PB GF	Lead, low level, EPA-239.2
SB EM	Antimony by EM-EPA 200.7
SE GF	Selenium, low lev. EPA-270.2
TL EM	Thallium by EM-EPA 200.7
V EM	Vanadium, ICPES, EPA-200.7
ZN EM	Zinc by EM-EPA 200.7

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)	Sample 04 (entered units)	Sample 05 (entered units)
HG_CV mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
K_EM mg/L	34 *	<300	52 *	56 *	<30
MG_EM mg/L	1100	3800	710	700	540
MN_EM mg/L	2.5	0.28 *	0.65	0.65	2.9
NA_EM mg/L	3200	9500	1700	1700	1700
NI_EM mg/L	<0.15	<1.5	<0.15	<0.15	<0.15
PB_GF mg/L	<0.002	<0.002	<0.002	<0.002	<0.002
SB_EM mg/L	<0.34	<3.4	<0.34	<0.34	<0.34
SE_GF mg/L	<0.040	<0.12	<0.008	<0.004	<0.004
TL_EM mg/L	<0.51	<5.1	<0.51	<0.51	<0.51
V_EM mg/Kg	<0.080 mg/L	<0.80 mg/L	<0.080 mg/L	<0.080 mg/L	<0.080 mg/L
ZN_EM mg/L	0.092 *	<0.20	0.070 *	0.070 *	0.086 *

RADIAN CORPORATION

Received: 08/19/89

RAS Sacramento REPORT
Results By Test

Work Order # S9-08-214
Continued From Above

TEST CODE default units	Sample 06 (entered units)	Sample 07 (entered units)	Sample 08 (entered units)	Sample 09 (entered units)	Sample 10 (entered units)
				84 Q % RECOVERY	
BA_EM mg/L	0.047 *	0.049 *	0.29 *	0.037 *	<0.20
				99 % RECOVERY	
				101 % RECOVERY	
BE_EM mg/L	<0.010	<0.010	<0.10	<0.010	<0.10
				99 % RECOVERY	
				102 % RECOVERY	
CA_EM mg/L	740 B	740 B	2400 B	730 B	680 B
				96 % RECOVERY	
				180 Q % RECOVERY	
CD_EM mg/L	<0.040	<0.040	<0.40	<0.040	<0.40
				98 % RECOVERY	
				97 % RECOVERY	
CN_TOT mg/L	<0.02	<0.02	<0.02	<0.02	<0.02

TEST CODE default units	Sample 06 (entered units)	Sample 07 (entered units)	Sample 08 (entered units)	Sample 09 (entered units)	Sample 10 (entered units)
HG_CV mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
				106 % RECOVERY	
				103 % RECOVERY	
K_EM mg/L	<30	48 *	<300	<30	<300
				110 % RECOVERY	
				58 Q % RECOVERY	
MG_EM mg/L	300	600	7000	260	550
				94 % RECOVERY	
				76 Q % RECOVERY	
MN_EM mg/L	1.3	0.63	1.4	1.2	<0.20
				101 % RECOVERY	
				104 % RECOVERY	
NA_EM mg/L	710	1600	19000	650	1700
				87 % RECOVERY	

TEST CODE default units	Sample 06 (entered units)	Sample 07 (entered units)	Sample 08 (entered units)	Sample 09 (entered units)	Sample 10 (entered units)
				78 Q % RECOVERY	
				75 Q % RECOVERY	
V_EM mg/Kg	<0.080 mg/L	<0.080 mg/L	<0.80 mg/L	<0.080 mg/L	<0.80 mg/L
				97 % RECOVERY	
				99 % RECOVERY	
ZN_EM mg/L	0.048 *	0.076 *	0.45 *	0.057 *	0.26 *
				98 % RECOVERY	
				98 % RECOVERY	

TEST CODE default units	Sample 11 (entered units)	Sample 12 (entered units)	Sample 13 (entered units)	Sample 14 (entered units)
301SWS Date Completed	08/21/89 DATE COMPLETED	08/21/89 DATE COMPLETED	08/21/89 DATE COMPLETED	
302SWS Date Completed	08/21/89 DATE COMPLETED	08/21/89 DATE COMPLETED	08/21/89 DATE COMPLETED	
AG_EM mg/L	<0.70	<0.70	<0.007	

TEST CODE default units	Sample 11 (entered units)	Sample 12 (entered units)	Sample 13 (entered units)	Sample 14 (entered units)
MN_EM mg/L	<0.20	<0.20	<0.002	
NA_EM mg/L	<2.9	12000	<0.029	
NI_EM mg/L	<1.5	<1.5	<0.015	
PB_GF mg/L	<0.002	<0.02	<0.002	
SB_EM mg/L	<3.4	<3.4	<0.034	
SE_GF mg/L	<0.004	<0.004	<0.004	
TL_EM mg/L	<5.1	<5.1	<0.051	
V_EM mg/Kg	<0.80 mg/L	<0.80 mg/L	<0.008 mg/L	
ZN_EM mg/L	<0.20	0.34 *	<0.002	

SAMPLE Sample Id	Test: 301SWS Date Completed	Test: 302SWS Date Completed	Test: AG EM mg/L	Test: AL EM mg/L	Test: AS GF mg/L
13 REAGENT BLANK H	08/21/89 DATE COMPLETED	08/21/89 DATE COMPLETED	<0.007	<0.053	<0.004

SAMPLE Sample Id	Test: BA EM mg/L	Test: BE EM mg/L	Test: CA EM mg/L	Test: CD EM mg/L	Test: CN TOT mg/L
01 MW-3-1 H2O	0.035 *	<0.010	880 B	<0.040	<0.02
02 MW-1-1a H2O	<0.20	<0.10	3900 B	<0.40	<0.02
03 MW-4-1a H2O	0.040 *	<0.010	780 B	<0.040	<0.02
04 MW-4-1b H2O	0.039 *	<0.010	780 B	<0.040	<0.02
05 MW-5-1a H2O	0.049 *	<0.010	960 B	<0.040	<0.02
06 MW-7-1 H2O	0.047 *	<0.010	740 B	<0.040	<0.02
07 MW-8-1 H2O	0.049 *	<0.010	740 B	<0.040	<0.02
08 MW-6-1 H2O	0.29 *	<0.10	2400 B	<0.40	<0.02
09 MW-2-1a H2O	0.037 *	<0.010	730 B	<0.040	<0.02
	99 % RECOVERY	99 % RECOVERY	96 % RECOVERY	98 % RECOVERY	88 % RECOVERY

SAMPLE Sample Id	Test: CD EM mg/Kg	Test: CR EM mg/L	Test: CU EM mg/L	Test: FE EM mg/L	Test: HG CV mg/L
06 MW-7-1 H2O	<0.070 mg/L	<0.070	0.070 *	0.49 B	<0.0002
07 MW-8-1 H2O	<0.070 mg/L	<0.070	0.067 *	0.31 *B	<0.0002
08 MW-6-1 H2O	<0.70 mg/L	<0.70	0.64 *	1.1 *B	<0.0002
09 MW-2-1a H2O	<0.070 mg/L	<0.070	<0.060	0.14 *B	<0.0002
	100 % RECOVERY	100 % RECOVERY	100 % RECOVERY	108 % RECOVERY	106 % RECOVERY
	102 % RECOVERY	102 % RECOVERY	102 % RECOVERY	104 % RECOVERY	103 % RECOVERY
10 S-2-1a H2O	<0.70 mg/L	<0.70	<0.60	2.5 *B	<0.0002
11 S-2-1b H2O	<0.70 mg/L	<0.70	<0.60	<0.70 B	<0.0002
12 S-4-1 H2O	<0.70 mg/L	<0.70	<0.60	2.2 *B	<0.0002
13 REAGENT BLANK H	<0.007 mg/L	<0.007	<0.006	0.008 *	<0.0002

SAMPLE Sample Id	Test: K EM mg/L	Test: MG EM mg/L	Test: MN EM mg/L	Test: NA EM mg/L	Test: NI EM mg/L
01 MW-3-1 H2O	34 *	1100	2.5	3200	<0.15

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-214

Received: 08/19/89 Results By Test

SAMPLE Sample Id	Test: PB GF mg/L	Test: SB EM mg/L	Test: SE GF mg/L	Test: TL EM mg/L	Test: V EM mg/Kg
01 MW-3-1 H2O	<0.002	<0.34	<0.040	<0.51	<0.080 mg/L
02 MW-1-1a H2O	<0.002	<3.4	<0.12	<5.1	<0.80 mg/L
03 MW-4-1a H2O	<0.002	<0.34	<0.008	<0.51	<0.080 mg/L
04 MW-4-1b H2O	<0.002	<0.34	<0.004	<0.51	<0.080 mg/L
05 MW-5-1a H2O	<0.002	<0.34	<0.004	<0.51	<0.080 mg/L
06 MW-7-1 H2O	<0.002	<0.34	<0.004	<0.51	<0.080 mg/L
07 MW-8-1 H2O	<0.002	<0.34	<0.004	<0.51	<0.080 mg/L
08 MW-6-1 H2O	<0.04	<3.4	<0.32	<5.1	<0.80 mg/L
09 MW-2-1a H2O	<0.002	<0.34	<0.020	<0.51	<0.080 mg/L
	42 Q % RECOVERY	93 % RECOVERY	0 Q % RECOVERY	78 Q % RECOVERY	97 % RECOVERY
	42 Q % RECOVERY	102 % RECOVERY	0 Q % RECOVERY	75 Q % RECOVERY	99 % RECOVERY
10 S-2-1a H2O	<0.002	<3.4	<0.004	<5.1	<0.80 mg/L
11 S-2-1b H2O	<0.002	<3.4	<0.004	<5.1	<0.80 mg/L
12 S-4-1 H2O	<0.02	<3.4	<0.004	<5.1	<0.80 mg/L

SAMPLE Sample Id	Test: ZN EM mg/L
	98
	% RECOVERY
10 S-2-1a H2O	0.26 *
11 S-2-1b H2O	<0.20
12 S-4-1 H2O	0.34 *
13 REAGENT BLANK H	<0.002

V_EM <0.80 mg/L ZN_EM <0.20 mg/L

SAMPLE ID MW-4-1a H2O SAMPLE # 03 FRACTIONS: A,B
Date & Time Collected 08/17/89 Category

301SWS 08/21/89 DATE COMPLETED 302SWS 08/21/89 DATE COMPLETED AG_EM <0.070 mg/L AL_EM <0.45 mg/L AS_GF <0.004 mg/L BA_EM 0.040 * mg/L

BE_EM <0.010 mg/L CA_EM 780 B mg/L CD_EM <0.040 mg/L CN_TOT <0.02 mg/L CO_EM <0.070 mg/L CR_EM <0.070 mg/L

CU_EM 0.11 * mg/L FE_EM 0.36 B mg/L HG_CV <0.0002 mg/L K_EM 52 * mg/L MG_EM 710 mg/L MN_EM 0.65 mg/L

NA_EM 1700 mg/L NI_EM <0.15 mg/L PB_GF <0.002 mg/L SB_EM <0.34 mg/L SE_GF <0.008 mg/L TL_EM <0.51 mg/L

V_EM <0.080 mg/L ZN_EM 0.070 * mg/L

SAMPLE ID MW-4-1b H2O SAMPLE # 04 FRACTIONS: A,B
Date & Time Collected 08/17/89 Category

301SWS 08/21/89 DATE COMPLETED 302SWS 08/21/89 DATE COMPLETED AG_EM <0.070 mg/L AL_EM <0.45 mg/L AS_GF <0.004 mg/L BA_EM 0.039 * mg/L

BE_EM <0.010 mg/L CA_EM 780 B mg/L CD_EM <0.040 mg/L CN_TOT <0.02 mg/L CO_EM <0.070 mg/L CR_EM <0.070 mg/L

SAMPLE ID MW-7-1 H2O SAMPLE # 06 FRACTIONS: A,B
Date & Time Collected 08/17/89 Category

301SWS 08/21/89 DATE COMPLETED	302SWS 08/21/89 DATE COMPLETED	AG_EM <0.070 mg/L	AL_EM 0.71 * mg/L	AS_GF <0.004 mg/L	BA_EM 0.047 * mg/L
BE_EM <0.010 mg/L	CA_EM 740 B mg/L	CD_EM <0.040 mg/L	CN_TOT <0.02 mg/L	CO_EM <0.070 mg/L	CR_EM <0.070 mg/L
CU_EM 0.070 * mg/L	FE_EM 0.49 B mg/L	HG_CV <0.0002 mg/L	K_EM <30 mg/L	MG_EM 300 mg/L	MN_EM 1.3 mg/L
NA_EM 710 mg/L	NI_EM <0.15 mg/L	PB_GF <0.002 mg/L	SB_EM <0.34 mg/L	SE_GF <0.004 mg/L	TL_EM <0.51 mg/L
V_EM <0.080 mg/L	ZN_EM 0.048 * mg/L				

SAMPLE ID MW-8-1 H2O SAMPLE # 07 FRACTIONS: A,B
Date & Time Collected 08/17/89 Category

301SWS 08/21/89 DATE COMPLETED	302SWS 08/21/89 DATE COMPLETED	AG_EM <0.070 mg/L	AL_EM <0.45 mg/L	AS_GF <0.004 mg/L	BA_EM 0.049 * mg/L
BE_EM <0.010 mg/L	CA_EM 740 B mg/L	CD_EM <0.040 mg/L	CN_TOT <0.02 mg/L	CO_EM <0.070 mg/L	CR_EM <0.070 mg/L
CU_EM 0.067 * mg/L	FE_EM 0.31 *B mg/L	HG_CV <0.0002 mg/L	K_EM 48 * mg/L	MG_EM 600 mg/L	MN_EM 0.63 mg/L
NA_EM 1600 mg/L	NI_EM <0.15 mg/L	PB_GF <0.002 mg/L	SB_EM <0.34 mg/L	SE_GF <0.004 mg/L	TL_EM <0.51 mg/L

Received: 08/19/89

Results by Sample

SAMPLE ID MW-2-1b MS H20 SAMPLE # 09 FRACTIONS: B

Date & Time Collected 08/18/89 Category

CN_TOT 88
% RECOVERY

SAMPLE ID MW-2-1c MSD H20 SAMPLE # 09 FRACTIONS: C

Date & Time Collected 08/18/89 Category

CN_TOT 91
% RECOVERY

SAMPLE ID MW-2-1a H20 SAMPLE # 09 FRACTIONS: D,E

Date & Time Collected 08/18/89 Category

301SWS 08/21/89 DATE COMPLETED	302SWS 08/21/89 DATE COMPLETED	AG_EM <0.070 mg/L	AL_EM <0.45 mg/L	AS_GF <0.004 mg/L	BA_EM 0.037 * mg/L
BE_EM <0.010 mg/L	CA_EM 730 B mg/L	CD_EM <0.040 mg/L	CO_EM <0.070 mg/L	CR_EM <0.070 mg/L	CU_EM <0.060 mg/L
FE_EM 0.14 *B mg/L	HG_CV <0.0002 mg/L	K_EM <30 mg/L	MG_EM 260 mg/L	MN_EM 1.2 mg/L	NA_EM 650 mg/L
NI_EM <0.15 mg/L	PB_GF <0.002 mg/L	SB_EM <0.34 mg/L	SE_GF <0.020 mg/L	TL_EM <0.51 mg/L	V_EM <0.080 mg/L
ZN_EM 0.057 * mg/L					

ZN_EM 98
% RECOVERY

SAMPLE ID S-2-1a H2O SAMPLE # 10 FRACTIONS: A,B,C
Date & Time Collected 08/18/89 Category

301SWS	08/21/89 DATE COMPLETED	302SWS	08/21/89 DATE COMPLETED	AG_EM	<0.70 mg/L	AL_EM	<4.5 mg/L	AS_GF	<0.004 mg/L	BA_EM	<0.20 mg/L
BE_EM	<0.10 mg/L	CA_EM	680 B mg/L	CD_EM	<0.40 mg/L	CN_TOT	<0.02 mg/L	CO_EM	<0.70 mg/L	CR_EM	<0.70 mg/L
CU_EM	<0.60 mg/L	FE_EM	2.5 *B mg/L	HG_CV	<0.0002 mg/L	K_EM	<300 mg/L	MG_EM	550 mg/L	MN_EM	<0.20 mg/L
NA_EM	1700 mg/L	NI_EM	<1.5 mg/L	PB_GF	<0.002 mg/L	SB_EM	<3.4 mg/L	SE_GF	<0.004 mg/L	TL_EM	<5.1 mg/L
V_EM	<0.80 mg/L	ZN_EM	0.26 * mg/L								

SAMPLE ID S-2-1b H2O SAMPLE # 11 FRACTIONS: A,B,C
Date & Time Collected 08/18/89 Category

301SWS	08/21/89 DATE COMPLETED	302SWS	08/21/89 DATE COMPLETED	AG_EM	<0.70 mg/L	AL_EM	<4.5 mg/L	AS_GF	<0.004 mg/L	BA_EM	<0.20 mg/L
BE_EM	<0.10 mg/L	CA_EM	<1.2 B mg/L	CD_EM	<0.40 mg/L	CN_TOT	<0.02 mg/L	CO_EM	<0.70 mg/L	CR_EM	<0.70 mg/L

SAMPLE ID REAGENT BLANK H2O SAMPLE # 13 FRACTIONS: A
Date & Time Collected not specified Category

301SWS	08/21/89	302SWS	08/21/89	AG_EM	<0.007	AL_EM	<0.053	AS_GF	<0.004	BA_EM	<0.002
DATE COMPLETED		DATE COMPLETED			mg/L		mg/L		mg/L		mg/L
BE_EM	<0.001	CA_EM	0.016 *	CD_EM	<0.004	CO_EM	<0.007	CR_EM	<0.007	CU_EM	<0.006
	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
FE_EM	0.008 *	HG_CV	<0.0002	K_EM	<3.0	MG_EM	<0.030	MN_EM	<0.002	NA_EM	<0.029
	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
NI_EM	<0.015	PB_GF	<0.002	SB_EM	<0.034	SE_GF	<0.004	TL_EM	<0.051	V_EM	<0.008
	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L
ZN_EM	<0.002										
	mg/L										

SAMPLE ID REAGENT BLANK H2O SAMPLE # 14 FRACTIONS: A
Date & Time Collected not specified Category

CN_TOT	<0.02
	mg/L

Appendix A

Comments, Notes and Definitions

Radian Work Order: S9-08-214

*

The asterisk(*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.

B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.

C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.

D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

Radian Work Order: S9-08-214

ND
This flag (or <) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added (spiked) to the sample for this analysis.

N\A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

Radian Work Order: S9-08-214

TERMS USED IN THIS REPORT:
Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion); liquids/water
	ug/Kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million); liquids/water
	mg/Kg	milligrams per kilogram (parts per million); soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-210

Received: 08/19/89

Results By Test

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)	Sample 04 (entered units)	Sample 05 (entered units)
EX_BNA Date Completed	08/24/89 DATE COMPLETED	08/24/89 DATE COMPLETED	08/24/89 DATE COMPLETED	08/24/89 DATE COMPLETED	08/24/89 DATE COMPLETED
VOA_S Date Completed	08/24/89	08/24/89	08/24/89	08/24/89	08/24/89

TEST CODE default units	Sample 06 (entered units)	Sample 07 (entered units)	Sample 08 (entered units)	Sample 10 (entered units)
EX_BNA Date Completed	08/24/89 DATE COMPLETED	08/24/89	08/24/89	08/24/89
VOA_S Date Completed	08/24/89	08/24/89	08/24/89	

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-210

Received: 08/19/89

Results by Sample

SAMPLE ID MW-3-1 H2O SAMPLE # 01 FRACTIONS: A,B,C

Date & Time Collected 08/17/89 Category

EX_BNA 08/24/89 VOA_S 08/24/89

DATE COMPLETED Date Completed

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-210

Received: 08/19/89 Results by Sample

SAMPLE ID MW-3-1 H2O FRACTION 01A TEST CODE MSNS V NAME NHSL Volatile Organics

Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 0821001A

INSTRMT F4 INJECTD 08/25/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID MW-3-1 H2O FRACTION 01A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
309	1,2-dichloroethane-d4	82	%	76 TO 114
410	toluene-d8	106	%	88 TO 110
549	BFB	100	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID MW-3-1 H2O FRACTION 01C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1317	84-74-2	di-n-butylphthalate	1.4 BJ	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

SAMPLE ID MW-1-1a H20 SAMPLE # 02 FRACTIONS: A,B,C
Date & Time Collected 08/17/89 Category

EX_BNA 08/24/89 VOA_S 08/24/89
DATE COMPLETED Date Completed

Received: 08/19/89

Results by Sample

SAMPLE ID MW-1-1a H2O FRACTION 02A TEST CODE MSNS V NAME NHSL Volatile Organics

Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 0321002A

INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
288	silanol, trimethyl	8

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID MW-1-1a H2O FRACTION 02A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/17/87 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
310	1,2-dichloroethane-d4	98	%	76 TO 114
411	toluene-d8	103	%	88 TO 110
550	BFB	95	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID MW-1-1a H20 FRACTION 02C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
1065	84-66-2	diethylphthalate	1.1 J	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1318	84-74-2	di-n-butylphthalate	3.8 +B	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

Received: 08/19/89

Results by Sample

SAMPLE ID MW-4-1a H20 SAMPLE # 03 FRACTIONS: A,B,C

Date & Time Collected 08/17/89 Category

EX_BNA 08/24/89 VOA_S 08/24/89

DATE COMPLETED Date Completed

SAMPLE ID MW-4-1a H2O FRACTION 03A TEST CODE MSNS V NAME NHSL Volatile Organics
Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 0921003A
INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID MW-4-1a H2O FRACTION 03A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
309	1,2-dichloroethane-d4	97	%	76 TO 114
410	toluene-d8	102	%	88 TO 110
549	BFB	96	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID MW-4-1a H20 FRACTION 03C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1323	84-74-2	di-n-butylphthalate	4.6 *B	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

Received: 08/19/89

Results by Sample

SAMPLE ID MW-4-1b H20 SAMPLE # 04 FRACTIONS: A,B,C

Date & Time Collected 08/17/89 Category

EX_BNA 08/24/89 VOA_S 08/24/89

DATE COMPLETED Date Completed

RAS Sacramento REPORT

Work Order # S9-08-210

Received: 08/19/89

Results by Sample

SAMPLE ID MW-4-1b H2O FRACTION 04A TEST CODE MSNS V NAME NHSL Volatile Organics

Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 0821004A

INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID MW-4-1b H2O FRACTION 04A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
309	1,2-dichloroethane-d4	101	%	76 TO 114
409	toluene-d8	103	%	88 TO 110
548	BFB	96	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID MW-4-1b H2O FRACTION Q4C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1318	84-74-2	di-n-butylphthalate	4.1 *	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

KAJIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-210

Received: 08/19/89

Results by Sample

SAMPLE ID MW-5-1a H2O SAMPLE # 05 FRACTIONS: A,B,C

Date & Time Collected 08/17/89 Category

EX_BNA 08/24/89 VOA_S 08/24/89

DATE COMPLETED Date Completed

SAMPLE ID MW-5-1a H2O FRACTION 05A TEST CODE MSNS V NAME NHSL Volatile Organics
Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 0821005A
INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
238	pentane, 3-methyl	62
264	unknown	17

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID MW-5-1a H20 FRACTION 05A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
485	108-90-7	chlorobenzene	2.9 J	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
313	1,2-dichloroethane-d4	113	%	76 TO 114
411	toluene-d8	128 Q	%	88 TO 110
549	BFB	97	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID MW-5-1a H20 FRACTION 05C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1319	84-74-2	di-n-butylphthalate	3.4 *B	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

Received: 08/19/89

Results by Sample

SAMPLE ID MW-7-1 H2O SAMPLE # 06 FRACTIONS: A,B,C

Date & Time Collected 08/17/89 Category

EX_BNA 08/24/89 VOA_S 08/24/89

DATE COMPLETED Date Completed

RAS Sacramento REPORT

Work Order # S9-08-210

Received: 08/19/89

Results by Sample

SAMPLE ID MW-7-1 H20 FRACTION Q6A TEST CODE MSNS V NAME NHSL Volatile Organics

Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 0821006A

INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID MW-7-1 H2O FRACTION 06A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4 methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
310	1,2-dichloroethane-d4	97	%	76 TO 114
410	toluene-d8	126 Q	%	88 TO 110
549	BFB	96	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID MW-7-1 H2O FRACTION 06C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1317	84-74-2	di-n-butylphthalate	4.1 *B	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

SAMPLE ID MW-8-1 H2O SAMPLE # 07 FRACTIONS: A,B,C
Date & Time Collected 08/17/89 Category

EX_BNA 08/24/89 VOA_S 08/24/89
Date Completed Date Completed

SAMPLE ID MW-8-1 H2O FRACTION 07A TEST CODE MSNS V NAME NHSL Volatile Organics
Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 0821007A
INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID MW-8-1 H2O FRACTION Q7A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
309	1,2-dichloroethane-d4	96	%	76 TO 114
410	toluene-d8	103	%	88 TO 110
549	BFB	95	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

KAJAN CORPORATION

Received: 08/19/89

RAS Sacramento REPORT
Results by Sample

Work Order # S9-08-210
Continued From Above

SAMPLE ID MW-8-1 H20 FRACTION 07C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.1
	88-06-2	2,4,6-trichlorophenol	ND	2.8
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	51
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.6
	99-09-2	3-nitroaniline	ND	51
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	43
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.8
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.3
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	51
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.7
	85-01-8	phenanthrene	ND	5.5
	120-12-7	anthracene	ND	1.9
1317	84-74-2	di-n-butylphthalate	2.9 *	2.6
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	45
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.6
	91-94-1	3,3'-dichlorobenzidine	ND	17

Received: 08/19/89

Results by Sample

SAMPLE ID MW-6-1 H2O SAMPLE # 08 FRACTIONS: A,B,C

Date & Time Collected 08/17/89 Category

EX_BNA 08/24/89 VOA_S 08/24/89

Date Completed Date Completed

SAMPLE ID MW-6-1 H2O FRACTION Q8A TEST CODE MSNS V NAME NHSL Volatile Organics
Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 08210098
INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
63	silane, fluorotrimethyl	7
287	silane, trimethyl	11

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID MW-6-1 H2O FRACTION 08A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
308	1,2-dichloroethane-d4	102	%	76 TO 114
410	toluene-d8	103	%	88 TO 110
549	BFB	96	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID MW-6-1 H20 FRACTION 08C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/17/89 Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3 5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3 6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1319	84-74-2	di-n-butylphthalate	2.2 BJ	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

SAMPLE ID REAGENT BLANK H2O FRACTION 09A TEST CODE MSNS V NAME NHSL Volatile Organics
Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 0921009A
INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID REAGENT BLANK H2O FRACTION 09A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected not specified Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
453	591-78-6	2-hexanone	1.5 J	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
309	1,2-dichloroethane-d4	81	%	76 TO 114
410	toluene-d8	103	%	88 TO 110
549	BFB	100	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID REAGENT BLANK H2O FRACTION 10A TEST CODE MSNS S NAME NHSL Semivolatile Organics
Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED EH

ANALYST SAL EXTRCTD 08/23/89 FILE # 0821010A
INSTRMT F2 INJECTD 09/06/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Tentatively identified based on NBS Library.
(3) Semiquantitative analysis.

SAMPLE ID REAGENT BLANK H2O FRACTION 10A TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected not specified Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1318	84-74-2	di-n-butylphthalate	5.9 *	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

SAMPLE ID TRIP BLANK H2O FRACTION 11A TEST CODE MSNS V NAME NHSL Volatile Organics
Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED LAK

ANALYST RY EXTRCTD FILE # 08210011A
INSTRMT F4 INJECTD 08/27/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID TRIP BLANK H2O FRACTION 11A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected not specified Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
298	1,2-dichloroethane-d4	98	%	76 TO 114
405	toluene-d8	100	%	88 TO 110
548	BFB	95	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

Appendix A

Comments, Notes and Definitions

Radian Work Order: S9-08-210

*

The asterisk(*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.

B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.

C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.

D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

Radian Work Order: S9-08-210

ND
This flag (or <) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added (spiked) to the sample for this analysis.

N\A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

Radian Work Order: S9-08-210

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion); liquids/water
	ug/Kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million); liquids/water
	mg/Kg	milligrams per kilogram (parts per million); soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN CORPORATION

RAS Sacramento REPORT

Work Order # S9-08-211

Received: 08/19/89

Results By Test

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)	Sample 04 (entered units)	Sample 06 (entered units)
EX_BNA Date Completed	08/24/89	08/24/89	08/24/89	08/24/89	08/24/89
	08/24/89				
	08/24/89				
VOA_S Date Completed	08/25/89	08/25/89	08/25/89	08/25/89	

Received: 08/19/89

Results by Sample

SAMPLE ID MW-2-1a H2O

SAMPLE # 01 FRACTIONS: A,B

Date & Time Collected 08/18/89 Category

VOA S 08/25/89
Date Completed

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-211

Received: 08/19/89 Results by Sample

SAMPLE ID MW-2-1a H20 FRACTION 01A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE HSL COMPOUNDS (1)

VERIFIED EH

ANALYST RY EXTRCTD FILE # 0821101A

INSTRMT F4 INJECTD 08/27/89 REAGENT BLANK #0821903A UNITS ug/L

LEVEL L MATRIX W FACTOR 1.000

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	74-87-3	chloromethane	ND	5.0
	74-83-9	bromomethane	ND	5.0
	75-01-4	vinyl chloride	ND	5.0
	75-00-3	chloroethane	ND	5.0
	75-09-2	methylene chloride	ND	2.8
	67-64-1	acetone	ND	7.5
	75-15-0	carbon disulfide	ND	1.7
	75-35-4	1,1-dichloroethene	ND	4.7
	75-34-3	1,1-dichloroethane	ND	2.8
	540-59-0	1,2-dichloroethene (total)	ND	1.6
	67-66-3	chloroform	ND	1.6
	107-06-2	1,2-dichloroethane	ND	2.8
	78-93-3	2-butanone	ND	25
	71-55-6	1,1,1-trichloroethane	ND	3.8
	56-23-5	carbon tetrachloride	ND	2.8
	108-05-4	vinyl acetate	ND	6.9
	75-27-4	bromodichloromethane	ND	2.2
	78-87-5	1,2-dichloropropane	ND	6.0
	10061-01-5	cis-1,3-dichloropropene	ND	5.0
	79-01-6	trichloroethene	ND	1.9
	124-48-1	dibromochloromethane	ND	3.1
	79-00-5	1,1,2-trichloroethane	ND	5.0
	71-43-2	benzene	ND	4.4
	10061-02-6	trans-1,3-dichloropropene	ND	5.0
	110-75-8	2-chloroethylvinylether	ND	5.0

SAMPLE ID MW-2-1b MS H2O FRACTION 01C TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE HSL COMPOUNDS (1)

VERIFIED EH

ANALYST RY EXTRCTD FILE # 0821101C
INSTRMT F4 INJECTD 08/27/89 REAGENT BLANK #0821903A UNITS% RECOV.

LEVEL L MATRIX W FACTOR 2.000

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	74-87-3	chloromethane	NA	10
	74-83-9	bromomethane	NA	10
	75-01-4	vinyl chloride	NA	10
	75-00-3	chloroethane	NA	10
	75-09-2	methylene chloride	NA	5.6
	67-64-1	acetone	NA	15
	75-15-0	carbon disulfide	NA	3.4
135	75-35-4	1,1-dichloroethene	110	9.4
	75-34-3	1,1-dichloroethane	NA	5.6
	540-59-0	1,2-dichloroethene (total)	NA	3.2
	67-66-3	chloroform	NA	3.2
	107-06-2	1,2-dichloroethane	NA	5.6
	78-93-3	2-butanone	NA	50
	71-55-6	1,1,1-trichloroethane	NA	7.6
	56-23-5	carbon tetrachloride	NA	5.6
	108-05-4	vinyl acetate	NA	14
	75-27-4	bromodichloromethane	NA	4.4
	78-87-5	1,2-dichloropropane	NA	12
	10061-01-5	cis-1,3-dichloropropene	NA	10
346	79-01-6	trichloroethene	90	3.8
	124-48-1	dibromochloromethane	NA	6.2
	79-00-5	1,1,2-trichloroethane	NA	10
309	71-43-2	benzene	91	8.8
	10061-02-6	trans-1,3-dichloropropene	NA	10
	110-75-8	2-chloroethylvinylether	NA	10

Received: 08/19/89 Results by Sample

SAMPLE ID MW-2-1c MSD H2O FRACTION 01E TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE HSL COMPOUNDS (1)

VERIFIED EH

ANALYST RY EXTRCTD FILE # 0821101E

INSTRMT F4 INJECTD 08/27/89 REAGENT BLANK #0821903A UNITS% RECOV.

LEVEL L MATRIX W FACTOR 2.000

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	74-87-3	chloromethane	NA	10
	74-83-9	bromomethane	NA	10
	75-01-4	vinyl chloride	NA	10
	75-00-3	chloroethane	NA	10
	75-09-2	methylene chloride	NA	5.6
	67-64-1	acetone	NA	15
	75-15-0	carbon disulfide	NA	3.4
138	75-35-4	1,1-dichloroethene	110	9.4
	75-34-3	1,1-dichloroethane	NA	5.6
	540-59-0	1,2-dichloroethene (total)	NA	3.2
	67-66-3	chloroform	NA	3.2
	107-06-2	1,2-dichloroethane	NA	5.6
	78-93-3	2-butanone	NA	50
	71-55-6	1,1,1-trichloroethane	NA	7.6
	56-23-5	carbon tetrachloride	NA	5.6
	108-05-4	vinyl acetate	NA	14
	75-27-4	bromodichloromethane	NA	4.4
	78-87-5	1,2-dichloropropane	NA	12
	10061-01-5	cis-1,3-dichloropropene	NA	10
346	79-01-6	trichloroethene	90	3.8
	124-48-1	dibromochloromethane	NA	6.2
	79-00-5	1,1,2-trichloroethane	NA	10
310	71-43-2	benzene	92	8.8
	10061-02-6	trans-1,3-dichloropropene	NA	10
	110-75-8	2-chloroethylvinylether	NA	10

Received: 08/19/89

Results by Sample

SAMPLE ID MW-2-1a H2O

SAMPLE # 01 FRACTIONS: G

Date & Time Collected 08/18/89 Category

EX_BNA 08/24/89
Date Completed

Received: 08/19/89

Results by Sample

SAMPLE ID MW-2-1a H2O FRACTION 01G TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE HSL COMPOUNDS (1)

ANALYST EH EXTRCTD 08/24/89 FILE # 0821101G VERIFIED EH

INSTRMT F2 INJECTD 09/01/89 FACTOR 1.000 UNITS ug/L

LEVEL L MATRIX W BLANK 0821106A

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	62-75-9	n-nitrosodimethylamine	ND	10
	108-95-2	phenol	ND	1.5
	62-53-3	aniline	ND	10
	111-44-4	bis(2-chloroethyl)ether	ND	5.7
	95-57-8	2-chlorophenol	ND	3.3
	541-73-1	1,3-dichlorobenzene	ND	1.9
	106-46-7	1,4-dichlorobenzene	ND	4.4
	100-51-6	benzyl alcohol	ND	10
	95-50-1	1,2-dichlorobenzene	ND	1.9
	95-48-7	2-methylphenol	ND	10
	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
	106-44-5	4-methylphenol	ND	10
	621-64-7	n-nitroso-di-n-propylamine	ND	10
	67-72-1	hexachloroethane	ND	1.6
	98-95-3	nitrobenzene	ND	1.9
	78-59-1	isophorone	ND	2.2
	88-75-5	2-nitrophenol	ND	3.6
	105-67-9	2,4-dimethylphenol	ND	2.7
	65-85-0	benzoic acid	ND	50
	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
	120-83-2	2,4-dichlorophenol	ND	2.7
	120-82-1	1,2,4-trichlorobenzene	ND	1.9
	91-20-3	naphthalene	ND	1.6
	106-47-8	4-chloroaniline	ND	10
	87-68-3	hexachlorobutadiene	ND	0.90
	59-50-7	4-chloro-3-methylphenol	ND	3.0

SAMPLE ID MW-2-1a H20 FRACTION 01G TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

	56-55-3	benzo(a)anthracene	ND	7.8
1648	117-81-7	bis(2-ethylhexyl)phthalate	4.8 *B	2.5

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	218-01-9	chrysene	ND	2.5
	117-84-0	di-n-octyl phthalate	ND	2.5
	205-99-2	benzo(b)fluoranthene	ND	4.8
	207-08-9	benzo(k)fluoranthene	ND	2.5
	50-32-8	benzo(a)pyrene	ND	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	ND	3.7
	53-70-3	dibenz(a,h)anthracene	ND	2.5
	191-24-2	benzo(g,h,i)perylene	ND	4.1

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
355	2-fluorophenol	57	%	21 - 100
485	d5-phenol	43	%	10 - 94
611	d5-nitrobenzene	88	%	35 - 114
884	2-fluorobiphenyl	84	%	43 - 116
1109	2,4,6-tribromophenol	56	%	10 - 123
1468	d14-terphenyl	81	%	33 - 141

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Detected as diphenylamine

Received: 08/19/89

Results by Sample

SAMPLE ID MW-2-1b MS H2O FRACTION 01H TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE HSL COMPOUNDS (1)

ANALYST EH EXTRCTD 08/24/89 FILE # 0821101H VERIFIED EH

INSTRMT F2 INJECTD 09/01/89 FACTOR 1.000 UNITS % RECOV.

LEVELL MATRIXW BLANK0821106A

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	62-75-9	n-nitrosodimethylamine	NA	10
478	108-95-2	phenol	65	1.5
	62-53-3	aniline	NA	10
	111-44-4	bis(2-chloroethyl)ether	NA	5.7
494	95-57-8	2-chlorophenol	70	3.3
	541-73-1	1,3-dichlorobenzene	NA	1.9
523	106-46-7	1,4-dichlorobenzene	72	4.4
	100-51-6	benzyl alcohol	NA	10
	95-50-1	1,2-dichlorobenzene	NA	1.9
	95-48-7	2-methylphenol	NA	10
	108-60-1	bis(2-chloroisopropyl)ether	NA	5.7
	106-44-5	4-methylphenol	NA	10
591	621-64-7	n-nitroso-di-n-propylamine	59	10
	67-72-1	hexachloroethane	NA	1.6
	98-95-3	nitrobenzene	NA	1.9
	78-59-1	isophorone	NA	2.2
	88-75-5	2-nitrophenol	NA	3.6
	105-67-9	2,4-dimethylphenol	NA	2.7
	65-85-0	benzoic acid	NA	50
	111-91-1	bis(2-chloroethoxy)methane	NA	5.3
	120-83-2	2,4-dichlorophenol	NA	2.7
708	120-82-1	1,2,4-trichlorobenzene	81	1.9
	91-20-3	naphthalene	NA	1.6
	106-47-8	4-chloroaniline	NA	10
	87-68-3	hexachlorobutadiene	NA	0.90
806	59-50-7	4-chloro-3-methylphenol	63	3.0

SAMPLE ID MW-2-1b MS H2O FRACTION Q1H TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

	56-55-3	benzo(a)anthracene	NA	7.8
	117-81-7	bis(2-ethylhexyl)phthalate	NA	2.5

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	218-01-9	chrysene	NA	2.5
	117-84-0	di-n-octyl phthalate	NA	2.5
	205-99-2	benzo(b)fluoranthene	NA	4.8
	207-08-9	benzo(k)fluoranthene	NA	2.5
	50-32-8	benzo(a)pyrene	NA	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	NA	3.7
	53-70-3	dibenz(a,h)anthracene	NA	2.5
	191-24-2	benzo(g,h,i)perylene	NA	4.1

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
335	2-fluorophenol	94	%	21 - 100
476	d5-phenol	64	%	10 - 94
608	d5-nitrobenzene	94	%	35 - 114
884	2-fluorobiphenyl	79	%	43 - 116
1109	2,4,6-tribromophenol	61	%	10 - 123
1468	d14-terphenyl	82	%	33 - 141

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Detected as diphenylamine

Received: 08/19/89

Results by Sample

SAMPLE ID MW-2-1c MSD H20 FRACTION 01I TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE HSL COMPOUNDS (1)

ANALYST EH EXTRCTD 08/24/89 FILE # 0821101I VERIFIED EH

INSTRMT F2 INJECTD 09/01/89 FACTOR 1.000 UNITS % RECOV.

LEVELL MATRIXW BLANK0821106A

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	62-75-9	n-nitrosodimethylamine	NA	10
487	108-95-2	phenol	64	1.5
	62-53-3	aniline	NA	10
	111-44-4	bis(2-chloroethyl)ether	NA	5.7
502	95-57-8	2-chlorophenol	78	3.3
	541-73-1	1,3-dichlorobenzene	NA	1.9
530	106-46-7	1,4-dichlorobenzene	74	4.4
	100-51-6	benzyl alcohol	NA	10
	95-50-1	1,2-dichlorobenzene	NA	1.9
	95-48-7	2-methylphenol	NA	10
	108-60-1	bis(2-chloroisopropyl)ether	NA	5.7
	106-44-5	4-methylphenol	NA	10
595	621-64-7	n-nitroso-di-n-propylamine	64	10
	67-72-1	hexachloroethane	NA	1.6
	98-95-3	nitrobenzene	NA	1.9
	78-59-1	isophorone	NA	2.2
	88-75-5	2-nitrophenol	NA	3.6
	105-67-9	2,4-dimethylphenol	NA	2.7
	65-85-0	benzoic acid	NA	50
	111-91-1	bis(2-chloroethoxy)methane	NA	5.3
	120-83-2	2,4-dichlorophenol	NA	2.7
710	120-82-1	1,2,4-trichlorobenzene	84	1.9
	91-20-3	naphthalene	NA	1.6
	106-47-8	4-chloroaniline	NA	10
	87-68-3	hexachlorobutadiene	NA	0.90
806	59-50-7	4-chloro-3-methylphenol	67	3.0

SAMPLE ID MW-2-1c MSD H20 FRACTION 01I TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

	56-55-3	benzo(a)anthracene	NA	7.8
	117-81-7	bis(2-ethylhexyl)phthalate	NA	2.5

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	218-01-9	chrysene	NA	2.5
	117-84-0	di-n-octyl phthalate	NA	2.5
	205-99-2	benzo(b)fluoranthene	NA	4.8
	207-08-9	benzo(k)fluoranthene	NA	2.5
	50-32-8	benzo(a)pyrene	NA	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	NA	3.7
	53-70-3	dibenz(a,h)anthracene	NA	2.5
	191-24-2	benzo(g,h,i)perylene	NA	4.1

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY	SURROGATE LIMITS
355	2-fluorophenol	88 %	21 - 100
485	d5-phenol	62 %	10 - 94
611	d5-nitrobenzene	89 %	35 - 114
883	2-fluorobiphenyl	89 %	43 - 116
1108	2,4,6-tribromophenol	66 %	10 - 123
1467	d14-terphenyl	81 %	33 - 141

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Detected as diphenylamine

Received: 08/19/89

Results by Sample

SAMPLE ID S-2-1a H20 FRACTION 02C TEST CODE MSNS S NAME NHSL Semivolatile Organics

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED EH

ANALYST EH EXTRCTD 08/24/89 FILE # 0821102C

INSTRMT F2 INJECTD 09/01/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
553	3-Pentanol, 3-ethyl	21
564	3-Pentanol, 3-ethyl or isomer	18

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Tentatively identified based on NBS Library.
(3) Semiquantitative analysis.

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-211

Received: 08/19/89 Results by Sample

SAMPLE ID S-2-1a H20 FRACTION 02A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE HSL COMPOUNDS (1)

VERIFIED EH

ANALYST RRM EXTRCTD FILE # 0821102A

INSTRMT F3 INJECTD 08/28/89 REAGENT BLANK #0826214A UNITS ug/L

LEVEL L MATRIX W FACTOR 1.000

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	74-87-3	chloromethane	ND	5.0
	74-83-9	bromomethane	ND	5.0
	75-01-4	vinyl chloride	ND	5.0
	75-00-3	chloroethane	ND	5.0
120	75-09-2	methylene chloride	3.4 *B	2.8
	67-64-1	acetone	ND	7.5
	75-15-0	carbon disulfide	ND	1.7
	75-35-4	1,1-dichloroethene	ND	4.7
	75-34-3	1,1-dichloroethane	ND	2.8
	540-59-0	1,2-dichloroethene (total)	ND	1.6
	67-66-3	chloroform	ND	1.6
	107-06-2	1,2-dichloroethane	ND	2.8
	78-93-3	2-butanone	ND	25
	71-55-6	1,1,1-trichloroethane	ND	3.8
	56-23-5	carbon tetrachloride	ND	2.8
	108-05-4	vinyl acetate	ND	6.9
	75-27-4	bromodichloromethane	ND	2.2
	78-87-5	1,2-dichloropropane	ND	6.0
	10061-01-5	cis-1,3-dichloropropene	ND	5.0
	79-01-6	trichloroethene	ND	1.9
	124-48-1	dibromochloromethane	ND	3.1
	79-00-5	1,1,2-trichloroethane	ND	5.0
	71-43-2	benzene	ND	4.4
	10061-02-6	trans-1,3-dichloropropene	ND	5.0
	110-75-8	2-chloroethylvinylether	ND	5.0

SAMPLE ID S-2-1a H2O FRACTION 02C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE HSL COMPOUNDS (1)

ANALYST EH EXTRCTD 08/24/89 FILE # 0821102C VERIFIED EH
INSTRMT F2 INJECTD 09/01/89 FACTOR 1.000 UNITS ug/L

LEVEL L MATRIX W BLANK 0821106A

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	62-75-9	n-nitrosodimethylamine	ND	10
	108-95-2	phenol	ND	1.5
	62-53-3	aniline	ND	10
	111-44-4	bis(2-chloroethyl)ether	ND	5.7
	95-57-8	2-chlorophenol	ND	3.3
	541-73-1	1,3-dichlorobenzene	ND	1.9
	106-46-7	1,4-dichlorobenzene	ND	4.4
	100-51-6	benzyl alcohol	ND	10
	95-50-1	1,2-dichlorobenzene	ND	1.9
	95-48-7	2-methylphenol	ND	10
	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
	106-44-5	4-methylphenol	ND	10
	621-64-7	n-nitroso-di-n-propylamine	ND	10
	67-72-1	hexachloroethane	ND	1.6
	98-95-3	nitrobenzene	ND	1.9
	78-59-1	isophorone	ND	2.2
	88-75-5	2-nitrophenol	ND	3.6
	105-67-9	2,4-dimethylphenol	ND	2.7
	65-85-0	benzoic acid	ND	50
	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
	120-83-2	2,4-dichlorophenol	ND	2.7
	120-82-1	1,2,4-trichlorobenzene	ND	1.9
	91-20-3	naphthalene	ND	1.6
	106-47-8	4-chloroaniline	ND	10
	87-68-3	hexachlorobutadiene	ND	0.90
	59-50-7	4-chloro-3-methylphenol	ND	3.0

SAMPLE ID S-2-1a H2O FRACTION 02C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

	56-55-3	benzo(a)anthracene	ND	7.8
1648	117-81-7	bis(2-ethylhexyl)phthalate	3.0 *B	2.5

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	218-01-9	chrysene	ND	2.5
	117-84-0	di-n-octyl phthalate	ND	2.5
	205-99-2	benzo(b)fluoranthene	ND	4.8
	207-08-9	benzo(k)fluoranthene	ND	2.5
	50-32-8	benzo(a)pyrene	ND	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	ND	3.7
	53-70-3	dibenz(a,h)anthracene	ND	2.5
	191-24-2	benzo(g,h,i)perylene	ND	4.1

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY	SURROGATE LIMITS
361	2-fluorophenol	130 Q %	21 - 100
489	d5-phenol	87 %	10 - 94
613	d5-nitrobenzene	85 %	35 - 114
884	2-fluorobiphenyl	79 %	43 - 116
1108	2,4,6-tribromophenol	101 %	10 - 123
1468	d14-terphenyl	86 %	33 - 141

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Detected as diphenylamine

SAMPLE ID S-2-1b H2O FRACTION 03C TEST CODE MSNS S NAME NHSL Semivolatile Organics
Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED EH

ANALYST EH EXTRCTD 08/24/89 FILE # 0821103C
INSTRMT F2 INJECTD 08/31/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Tentatively identified based on NBS Library.
(3) Semiquantitative analysis.

Received: 08/19/89

Results by Sample

SAMPLE ID S-2-1b H20 FRACTION 03A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE HSL COMPOUNDS (1)

VERIFIED EH

ANALYST RRM EXTRCTD FILE # 0821103A

INSTRMT F3 INJECTD 08/28/89 REAGENT BLANK #0826214A UNITS ug/L

LEVEL L MATRIX W FACTOR 1.000

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	74-87-3	chloromethane	ND	5.0
	74-83-9	bromomethane	ND	5.0
	75-01-4	vinyl chloride	ND	5.0
	75-00-3	chloroethane	ND	5.0
117	75-09-2	methylene chloride	3.1 *B	2.8
	67-64-1	acetone	ND	7.5
	75-15-0	carbon disulfide	ND	1.7
	75-35-4	1,1-dichloroethene	ND	4.7
	75-34-3	1,1-dichloroethane	ND	2.8
	540-59-0	1,2-dichloroethene (total)	ND	1.6
	67-66-3	chloroform	ND	1.6
	107-06-2	1,2-dichloroethane	ND	2.8
	78-93-3	2-butanone	ND	25
	71-55-6	1,1,1-trichloroethane	ND	3.8
	56-23-5	carbon tetrachloride	ND	2.8
	108-05-4	vinyl acetate	ND	6.9
	75-27-4	bromodichloromethane	ND	2.2
	78-87-5	1,2-dichloropropane	ND	6.0
	10061-01-5	cis-1,3-dichloropropene	ND	5.0
	79-01-6	trichloroethene	ND	1.9
	124-48-1	dibromochloromethane	ND	3.1
	79-00-5	1,1,2-trichloroethane	ND	5.0
	71-43-2	benzene	ND	4.4
	10061-02-6	trans-1,3-dichloropropene	ND	5.0
	110-75-8	2-chloroethylvinylether	ND	5.0

SAMPLE ID S-2-1b H20 FRACTION 03C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE HSL COMPOUNDS (1)

ANALYST EH EXTRCTD 08/24/89 FILE # 0821103C VERIFIED EH
INSTRMT F2 INJECTD 08/31/89 FACTOR 1.010 UNITS ug/L

LEVELL MATRIXW BLANK0821106A

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	62-75-9	n-nitrosodimethylamine	ND	10
	108-95-2	phenol	ND	1.5
	62-53-3	aniline	ND	10
	111-44-4	bis(2-chloroethyl)ether	ND	5.8
	95-57-8	2-chlorophenol	ND	3.3
	541-73-1	1,3-dichlorobenzene	ND	1.9
	106-46-7	1,4-dichlorobenzene	ND	4.4
	100-51-6	benzyl alcohol	ND	10
	95-50-1	1,2-dichlorobenzene	ND	1.9
	95-48-7	2-methylphenol	ND	10
	108-60-1	bis(2-chloroisopropyl)ether	ND	5.8
	106-44-5	4-methylphenol	ND	10
	621-64-7	n-nitroso-di-n-propylamine	ND	10
	67-72-1	hexachloroethane	ND	1.6
	98-95-3	nitrobenzene	ND	1.9
	78-59-1	isophorone	ND	2.2
	88-75-5	2-nitrophenol	ND	3.6
	105-67-9	2,4-dimethylphenol	ND	2.7
	65-85-0	benzoic acid	ND	51
	111-91-1	bis(2-chloroethoxy)methane	ND	5.4
	120-83-2	2,4-dichlorophenol	ND	2.7
	120-82-1	1,2,4-trichlorobenzene	ND	1.9
	91-20-3	naphthalene	ND	1.6
	106-47-8	4-chloroaniline	ND	10
	87-68-3	hexachlorobutadiene	ND	0.91
	59-50-7	4-chloro-3-methylphenol	ND	3.0

SAMPLE ID S-2-1b H20 FRACTION 03C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

	56-55-3	benzo(a)anthracene	ND	7.9
1648	117-81-7	bis(2-ethylhexyl)phthalate	2.1 BJ	2.5

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	218-01-9	chrysene	ND	2.5
	117-84-0	di-n-octyl phthalate	ND	2.5
	205-99-2	benzo(b)fluoranthene	ND	4.8
	207-08-9	benzo(k)fluoranthene	ND	2.5
	50-32-8	benzo(a)pyrene	ND	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	ND	3.7
	53-70-3	dibenz(a,h)anthracene	ND	2.5
	191-24-2	benzo(g,h,i)perylene	ND	4.1

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY	SURROGATE LIMITS
359	2-fluorophenol	122 Q %	21 - 100
488	d5-phenol	95 Q %	10 - 94
613	d5-nitrobenzene	87 %	35 - 114
884	2-fluorobiphenyl	77 %	43 - 116
1108	2,4,6-tribromophenol	89 %	10 - 123
1468	d14-terphenyl	95 %	33 - 141

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Detected as diphenylamine

Received: 08/19/89

Results by Sample

SAMPLE ID S-4-1 H20 FRACTION 04C TEST CODE MSNS S NAME NHSL Semivolatile Organics

Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED EH

ANALYST EH EXTRCTD 08/24/89 FILE # 0821104C

INSTRMT F2 INJECTD 08/31/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
551	3-Pentanol, 3-ethyl	12
562	3-Pentanol, 3-ethyl or isomer	7

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Tentatively identified based on NBS Library.
(3) Semiquantitative analysis.

SAMPLE ID S-4-1 H20 FRACTION 04A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE HSL COMPOUNDS (1)

VERIFIED EH

ANALYST RRM EXTRCTD FILE # 0821104A
INSTRMT F3 INJECTD 08/28/89 REAGENT BLANK #0826214A UNITS ug/L

LEVEL L MATRIX W FACTOR 1.000

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	74-87-3	chloromethane	ND	5.0
	74-83-9	bromomethane	ND	5.0
	75-01-4	vinyl chloride	ND	5.0
	75-00-3	chloroethane	ND	5.0
120	75-09-2	methylene chloride	3.0 *B	2.8
	67-64-1	acetone	ND	7.5
	75-15-0	carbon disulfide	ND	1.7
	75-35-4	1,1-dichloroethene	ND	4.7
	75-34-3	1,1-dichloroethane	ND	2.8
	540-59-0	1,2-dichloroethene (total)	ND	1.6
	67-66-3	chloroform	ND	1.6
	107-06-2	1,2-dichloroethane	ND	2.8
	78-93-3	2-butanone	ND	25
	71-55-6	1,1,1-trichloroethane	ND	3.8
	56-23-5	carbon tetrachloride	ND	2.8
	108-05-4	vinyl acetate	ND	6.9
	75-27-4	bromodichloromethane	ND	2.2
	78-87-5	1,2-dichloropropane	ND	6.0
	10061-01-5	cis-1,3-dichloropropene	ND	5.0
	79-01-6	trichloroethene	ND	1.9
	124-48-1	dibromochloromethane	ND	3.1
	79-00-5	1,1,2-trichloroethane	ND	5.0
	71-43-2	benzene	ND	4.4
	10061-02-6	trans-1,3-dichloropropene	ND	5.0
	110-75-8	2-chloroethylvinylether	ND	5.0

SAMPLE ID S-4-1 H20 FRACTION 04C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE HSL COMPOUNDS (1)

ANALYST EH EXTRCTD 08/24/89 FILE # 0821104C VERIFIED EH
INSTRMT F2 INJECTD 08/31/89 FACTOR 1.000 UNITS ug/L

LEVEL L MATRIX W BLANK 0821106A

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	62-75-9	n-nitrosodimethylamine	ND	10
	108-95-2	phenol	ND	1.5
	62-53-3	aniline	ND	10
	111-44-4	bis(2-chloroethyl)ether	ND	5.7
	95-57-8	2-chlorophenol	ND	3.3
	541-73-1	1,3-dichlorobenzene	ND	1.9
	106-46-7	1,4-dichlorobenzene	ND	4.4
	100-51-6	benzyl alcohol	ND	10
	95-50-1	1,2-dichlorobenzene	ND	1.9
	95-48-7	2-methylphenol	ND	10
	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
	106-44-5	4-methylphenol	ND	10
	621-64-7	n-nitroso-di-n-propylamine	ND	10
	67-72-1	hexachloroethane	ND	1.6
	98-95-3	nitrobenzene	ND	1.9
	78-59-1	isophorone	ND	2.2
	88-75-5	2-nitrophenol	ND	3.6
	105-67-9	2,4-dimethylphenol	ND	2.7
	65-85-0	benzoic acid	ND	50
	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
	120-83-2	2,4-dichlorophenol	ND	2.7
	120-82-1	1,2,4-trichlorobenzene	ND	1.9
	91-20-3	naphthalene	ND	1.6
	106-47-8	4-chloroaniline	ND	10
	87-68-3	hexachlorobutadiene	ND	0.90
	59-50-7	4-chloro-3-methylphenol	ND	3.0

SAMPLE ID S-4-1 H2O FRACTION 04C TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected 08/18/89 Category

	56-55-3	benzo(a)anthracene	ND	7.8
1647	117-81-7	bis(2-ethylhexyl)phthalate	2.3 BJ	2.5

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	218-01-9	chrysene	ND	2.5
	117-84-0	di-n-octyl phthalate	ND	2.5
	205-99-2	benzo(b)fluoranthene	ND	4.8
	207-08-9	benzo(k)fluoranthene	ND	2.5
	50-32-8	benzo(a)pyrene	ND	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	ND	3.7
	53-70-3	dibenz(a,h)anthracene	ND	2.5
	191-24-2	benzo(g,h,i)perylene	ND	4.1

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY	SURROGATE LIMITS
353	2-fluorophenol	98 %	21 - 100
485	d5-phenol	76 %	10 - 94
611	d5-nitrobenzene	82 %	35 - 114
884	2-fluorobiphenyl	79 %	43 - 116
1108	2,4,6-tribromophenol	85 %	10 - 123
1467	d14-terphenyl	87 %	33 - 141

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Detected as diphenylamine

SAMPLE ID REAGENT BLANK H2O FRACTION Q5B TEST CODE MSNS V NAME NHSL Volatile Organics
Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET
PURGEABLE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED EH

ANALYST RRM EXTRCTD FILE # 0826214A
INSTRMT F3 INJECTD 08/28/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
582	UNKNOWN	5.0

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) = Tentatively identified based on the NBS Library.
(3) = Semiquantitative analysis

SAMPLE ID REAGENT BLANK H2O FRACTION 05A TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected not specified Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
	591-78-6	2-hexanone	ND	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
310	1,2-dichloroethane-d4	112	%	76 TO 114
411	toluene-d8	101	%	88 TO 110
550	BFB	96	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID REAGENT BLANK H2O FRACTION 05B TEST CODE SW 624 NAME VOA/SW8240 3rd- (LIQUID)
Date & Time Collected not specified Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	75-25-2	bromoform	ND	4.7
418	591-78-6	2-hexanone	3.9 J	36
	108-10-1	4-methyl-2-pentanone	ND	46
	127-18-4	tetrachloroethene	ND	4.1
	79-34-5	1,1,2,2-tetrachloroethane	ND	6.9
	108-88-3	toluene	ND	6.0
	108-90-7	chlorobenzene	ND	6.0
	100-41-4	ethylbenzene	ND	7.2
	100-42-5	styrene	ND	3.0
	95-47-6	total xylenes	ND	4.6

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY		SURROGATE LIMITS
257	1,2-dichloroethane-d4	97	%	76 TO 114
371	toluene-d8	102	%	88 TO 110
517	BFB	100	%	86 TO 115

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID REAGENT BLANK H2O FRACTION 06A TEST CODE MSNS S NAME NHSL Semivolatile Organics
Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET
SEMIVOLATILE TENTATIVELY IDENTIFIED COMPOUNDS (1)

VERIFIED EH

ANALYST EH EXTRCTD 08/24/89 FILE # 0821106A
INSTRMT F2 INJECTD 08/31/89 UNITS ug/L

SCAN	COMPOUND(2)	RESULT(3)
	ND	

(1) See Appendix A for Glossary of Report and Data Flag Definitions
(2) Tentatively identified based on NBS Library.
(3) Semiquantitative analysis.

SAMPLE ID REAGENT BLANK H2O FRACTION 06A TEST CODE SW 625 NAME SemiVOA/SW8270 3rd(LIQUID)
Date & Time Collected not specified Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	91-57-6	2-methylnaphthalene	ND	10
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	95-95-4	2,4,5-trichlorophenol	ND	10
	91-58-7	2-chloronaphthalene	ND	1.9
	88-74-4	2-nitroaniline	ND	50
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	99-09-2	3-nitroaniline	ND	50
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42
	100-02-7	4-nitrophenol	ND	2.4
	132-64-9	dibenzofuran	ND	10
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	100-01-06	4-nitroaniline	ND	50
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine (2)	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
1316	84-74-2	di-n-butylphthalate	8.3 *	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17

FRACTION AND TEST CODES FOR WORK NOT REPORTED ELSEWHERE

01D	:	DUP624
01F	:	DUP624

Appendix A

Comments, Notes and Definitions

Notes and Definitions

Radian Work Order: S9-08-211

*

The asterisk(*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.

B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.

C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.

D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

Radian Work Order: S9-08-211

ND
This flag (or <) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added (spiked) to the sample for this analysis.

N\A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

Radian Work Order: S9-08-211

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion); liquids/water
	ug/Kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million); liquids/water
	mg/Kg	milligrams per kilogram (parts per million); soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-186

Received: 08/17/89

Results By Test

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)	Sample 04 (entered units)	Sample 05 (entered units)
EXHERB Date Completed	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED
EXPEST Date Completed	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED

TEST CODE default units	Sample 06 (entered units)	Sample 07 (entered units)
EXHERB Date Completed		08/22/89 DATE COMPLETED
EXPEST Date Completed	08/22/89 DATE COMPLETED	

Received: 08/17/89

Results by Sample

SAMPLE ID MW-3-1 H2O SAMPLE # 01 FRACTIONS: A,B

Date & Time Collected 08/16/89 Category

EXHERB 08/22/89 EXPEST 08/22/89

DATE COMPLETED DATE COMPLETED

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-186

Received: 08/17/89 Results by Sample

SAMPLE ID MW-3-1 H20 FRACTION 01A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/16/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 719080831 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 4 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.040	4
58-89-9	gamma-BHC (lindane)	ND	0.040	4
319-85-7	beta-BHC	ND	0.040	4
76-44-8	Heptachlor	ND	0.040	4
319-86-8	delta-BHC	ND	0.040	4
309-00-02	Aldrin	ND	0.040	4
1024-57-3	Heptachlor Epoxide	ND	0.040	4
959-98-8	Endosulfan I	ND	0.040	4
72-55-9	4,4'-DDE	ND	0.040	4
60-57-1	Dieldrin	ND	0.040	4
72-20-8	Endrin	ND	0.040	4
72-54-8	4,4'-DDD	ND	0.040	4
33213-65-9	Endosulfan II	ND	0.12	4
50-29-3	4,4'-DDT	ND	0.080	4
7421-93-4	Endrin Aldehyde	ND	0.080	4
1031-07-8	Endosulfan Sulphate	ND	0.20	4
53494-70-5	Endrin Ketone	ND	0.20	4
72-43-5	Methoxychlor	ND	0.20	4
57-74-9	Chlordane	ND	0.20	4
8001-35-2	Toxaphene	ND	2.0	4
12674-11-2	PCB-1016	ND	0.40	4
11104-28-2	PCB-1221	ND	0.80	4
11141-16-5	PCB-1232	ND	0.80	4
53469-21-9	PCB-1242	ND	0.40	4
12672-29-6	PCB-1248	ND	0.40	4
11097-69-1	PCB-1254	ND	0.80	4
11096-82-5	PCB-1260	1.0 C	0.80	4

SURROGATE 1770-80-5 Dibutylchlorendate 57 % Recovery

Received: 08/17/89

Results by Sample

SAMPLE ID MW-2-1a H2O

SAMPLE # 02 FRACTIONS: A,B

Date & Time Collected 08/16/89 Category

EXHERB 08/22/89 EXPEST 08/22/89

DATE COMPLETED DATE COMPLETED

SAMPLE ID MW-2-1a H20 FRACTION 02A TEST CODE 608 NAME E608-PEST/PCBs in WATER
Date & Time Collected 08/16/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 719090832 VERIFIED JD
INSTRMT 7 INJECTD 09/08/89 FACTOR 4 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.040	4
58-89-9	gamma-BHC (lindane)	ND	0.040	4
319-85-7	beta-BHC	ND	0.040	4
76-44-8	Heptachlor	ND	0.040	4
319-86-8	delta-BHC	ND	0.040	4
309-00-02	Aldrin	ND	0.040	4
1024-57-3	Heptachlor Epoxide	ND	0.040	4
959-98-8	Endosulfan I	ND	0.040	4
72-55-9	4,4'-DDE	ND	0.040	4
60-57-1	Dieldrin	ND	0.040	4
72-20-8	Endrin	ND	0.040	4
72-54-8	4,4'-DDD	ND	0.040	4
33213-65-9	Endosulfan II	ND	0.12	4
50-29-3	4,4'-DDT	ND	0.080	4
7421-93-4	Endrin Aldehyde	ND	0.080	4
1031-07-8	Endosulfan Sulphate	ND	0.20	4
53494-70-5	Endrin Ketone	ND	0.20	4
72-43-5	Methoxychlor	ND	0.20	4
57-74-9	Chlordane	ND	0.20	4
8001-35-2	Toxaphene	ND	2.0	4
12674-11-2	PCB-1016	ND	0.40	4
11104-28-2	PCB-1221	ND	0.80	4
11141-16-5	PCB-1232	ND	0.80	4
53469-21-9	PCB-1242	ND	0.40	4
12672-29-6	PCB-1248	ND	0.40	4
11097-69-1	PCB-1254	ND	0.80	4
11096-82-5	PCB-1260	1.1 C	0.80	4

SURROGATE 1770-80-5 Dibutylchlorendate 81 % Recovery

Received: 08/17/89

Results by Sample

SAMPLE ID MW-2-1b H2O

SAMPLE # 03 FRACTIONS: A,B

Date & Time Collected 08/16/89 Category

EXHERB 08/22/89 EXPEST 08/22/89

DATE COMPLETED DATE COMPLETED

SAMPLE ID MW-2-1b H20 FRACTION 03A TEST CODE 608 NAME E608-PEST/PCBs in WATER
Date & Time Collected 08/16/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 719090833 VERIFIED JD
INSTRMT 7 INJECTD 09/08/89 FACTOR 4 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.040	4
58-89-9	gamma-BHC (lindane)	ND	0.040	4
319-85-7	beta-BHC	ND	0.040	4
76-44-8	Heptachlor	ND	0.040	4
319-86-8	delta-BHC	ND	0.040	4
309-00-02	Aldrin	ND	0.040	4
1024-57-3	Heptachlor Epoxide	ND	0.040	4
959-98-8	Endosulfan I	ND	0.040	4
72-55-9	4,4'-DDE	ND	0.040	4
60-57-1	Dieldrin	ND	0.040	4
72-20-8	Endrin	ND	0.040	4
72-54-8	4,4'-DDD	ND	0.040	4
33213-65-9	Endosulfan II	ND	0.12	4
50-29-3	4,4'-DDT	ND	0.080	4
7421-93-4	Endrin Aldehyde	ND	0.080	4
1031-07-8	Endosulfan Sulphate	ND	0.20	4
53494-70-5	Endrin Ketone	ND	0.20	4
72-43-5	Methoxychlor	ND	0.20	4
57-74-9	Chlordane	ND	0.20	4
8001-35-2	Toxaphene	ND	2.0	4
12674-11-2	PCB-1016	ND	0.40	4
11104-28-2	PCB-1221	ND	0.80	4
11141-16-5	PCB-1232	ND	0.80	4
53469-21-9	PCB-1242	ND	0.40	4
12672-29-6	PCB-1248	ND	0.40	4
11097-69-1	PCB-1254	ND	0.80	4
11096-82-5	PCB-1260	ND	0.80	4

SURROGATE 1770-80-5 Dibutylchlorendate 79 % Recovery

Received: 08/17/89

Results by Sample

SAMPLE ID MW-2-1c H20 SAMPLE # 04 FRACTIONS: A,B

Date & Time Collected 08/16/89 Category

EXHERB 08/22/89 EXPEST 08/22/89

DATE COMPLETED DATE COMPLETED

SAMPLE ID MW-2-1c H20 FRACTION 04A TEST CODE 608 NAME E608-PEST/PCBs in WATER
Date & Time Collected 08/16/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 719090834 VERIFIED JD
INSTRMT 7 INJECTD 09/08/89 FACTOR 4 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.040	4
58-89-9	gamma-BHC (lindane)	ND	0.040	4
319-85-7	beta-BHC	ND	0.040	4
76-44-8	Heptachlor	ND	0.040	4
319-86-8	delta-BHC	ND	0.040	4
309-00-02	Aldrin	ND	0.040	4
1024-57-3	Heptachlor Epoxide	ND	0.040	4
959-98-8	Endosulfan I	ND	0.040	4
72-55-9	4,4'-DDE	ND	0.040	4
60-57-1	Dieldrin	ND	0.040	4
72-20-8	Endrin	ND	0.040	4
72-54-8	4,4'-DDD	ND	0.040	4
33213-65-9	Endosulfan II	ND	0.12	4
50-29-3	4,4'-DDT	ND	0.080	4
7421-93-4	Endrin Aldehyde	ND	0.080	4
1031-07-8	Endosulfan Sulphate	ND	0.20	4
53494-70-5	Endrin Ketone	ND	0.20	4
72-43-5	Methoxychlor	ND	0.20	4
57-74-9	Chlordane	ND	0.20	4
8001-35-2	Toxaphene	ND	2.0	4
12674-11-2	PCB-1016	ND	0.40	4
11104-28-2	PCB-1221	ND	0.80	4
11141-16-5	PCB-1232	ND	0.80	4
53469-21-9	PCB-1242	ND	0.40	4
12672-29-6	PCB-1248	ND	0.40	4
11097-69-1	PCB-1254	ND	0.80	4
11096-82-5	PCB-1260	ND	0.80	4

SURROGATE 1770-80-5 Dibutylchlorendate 83 % Recovery

SAMPLE ID MW-5-1a H2O SAMPLE # 05 FRACTIONS: A,B
Date & Time Collected 08/16/89 Category

EXHERB 08/22/89 EXPEST 08/22/89
DATE COMPLETED DATE COMPLETED

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-186

Received: 08/17/89 Results by Sample

SAMPLE ID MW-5-1a H20 FRACTION 05A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/16/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 719090835 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 5 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.050	5
58-89-9	gamma-BHC (lindane)	ND	0.050	5
319-85-7	beta-BHC	ND	0.050	5
76-44-8	Heptachlor	ND	0.050	5
319-86-8	delta-BHC	ND	0.050	5
309-00-02	Aldrin	ND	0.050	5
1024-57-3	Heptachlor Epoxide	ND	0.050	5
959-98-8	Endosulfan I	ND	0.050	5
72-55-9	4,4'-DDE	ND	0.050	5
60-57-1	Dieldrin	ND	0.050	5
72-20-8	Endrin	ND	0.050	5
72-54-8	4,4'-DDD	ND	0.050	5
33213-65-9	Endosulfan II	ND	0.15	5
50-29-3	4,4'-DDT	ND	0.10	5
7421-93-4	Endrin Aldehyde	ND	0.10	5
1031-07-8	Endosulfan Sulphate	ND	0.25	5
53494-70-5	Endrin Ketone	ND	0.25	5
72-43-5	Methoxychlor	ND	0.25	5
57-74-9	Chlordane	ND	0.25	5
8001-35-2	Toxaphene	ND	2.5	5
12674-11-2	PCB-1016	ND	0.50	5
11104-28-2	PCB-1221	ND	1.0	5
11141-16-5	PCB-1232	ND	1.0	5
53469-21-9	PCB-1242	ND	0.50	5
12672-29-6	PCB-1248	ND	0.50	5
11097-69-1	PCB-1254	ND	1.0	5
11096-82-5	PCB-1260	ND	1.0	5

SURROGATE 1770-80-5 Dibutylchlorendate 64 % Recovery

Received: 08/17/89

Results by Sample

SAMPLE ID REAGENT BLANK H2O

SAMPLE # 06 FRACTIONS: A

Date & Time Collected not specified Category

EXPEST 08/22/89
DATE COMPLETED

SAMPLE ID REAGENT BLANK H2O FRACTION 06A TEST CODE 608 NAME E608-PEST/PCBs in WATER
Date & Time Collected not specified Category

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID REAGENT BLANK H2O FRACTION 07A TEST CODE 509B NAME Herbicides in water
Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET
HERBICIDES (1)

VERIFIED JD

ANALYST AM EXTRCTD 08/22/89 FILE # 11909054
INSTRMT 1 INJECTD 09/05/89 FACTOR 1 UNITS ug/L

CAS #	COMPOUND	RESULT	DET. LIMIT	FACTOR
94-75-7	2,4-D	ND	0.50	1
93-72-1	2,4,5-TP (Silvex)	ND	0.10	1
93-76-5	2,4,5-T	NA	0.10	1
88-85-7	Dinoseb	NA	0.15	1

SURROGATE

2,4-Dichlorophenyl Acetic Acid 101 % Recovery

(1) See Appendix A for Glossary of Report and Data Flag Definitions

Appendix A

Comments, Notes and Definitions

Radian Work Order: S9-08-186

*

The asterisk(*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.

B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.

C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.

D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

Radian Work Order: S9-08-186

ND
This flag (or <) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added (spiked) to the sample for this analysis.

N\A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

Radian Work Order: S9-08-186

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level.. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion); liquids/water
	ug/Kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million); liquids/water
	mg/Kg	milligrams per kilogram (parts per million); soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-180

Received: 08/16/89

Results By Test

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)	Sample 04 (entered units)	Sample 05 (entered units)
EXHERB Date Completed	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED
EXPEST Date Completed	08/18/89	08/18/89	08/18/89	08/18/89	08/18/89

TEST CODE default units	Sample 06 (entered units)	Sample 07 (entered units)
EXHERB Date Completed		08/22/89 DATE COMPLETED
EXPEST Date Completed	08/18/89	

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-180

Received: 08/16/89

Results by Sample

SAMPLE ID MW1-1A H2O SAMPLE # 01 FRACTIONS: A,B

Date & Time Collected 08/15/89 Category

EXHERB 08/22/89 EXPEST 08/18/89

DATE COMPLETED Date Completed

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-180

Received: 08/16/89 Results by Sample

SAMPLE ID MW1-1A H2O FRACTION 01A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/15/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/18/89 FILE # 719090823 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 1 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.010	1
58-89-9	gamma-BHC (lindane)	ND	0.010	1
319-85-7	beta-BHC	ND	0.010	1
76-44-8	Heptachlor	ND	0.010	1
319-86-8	delta-BHC	ND	0.010	1
309-00-02	Aldrin	ND	0.010	1
1024-57-3	Heptachlor Epoxide	ND	0.010	1
959-98-8	Endosulfan I	ND	0.010	1
72-55-9	4,4'-DDE	ND	0.010	1
60-57-1	Dieldrin	ND	0.010	1
72-20-8	Endrin	ND	0.010	1
72-54-8	4,4'-DDD	ND	0.010	1
33213-65-9	Endosulfan II	ND	0.030	1
50-29-3	4,4'-DDT	ND	0.020	1
7421-93-4	Endrin Aldehyde	ND	0.020	1
1031-07-8	Endosulfan Sulphate	ND	0.050	1
53494-70-5	Endrin Ketone	ND	0.050	1
72-43-5	Methoxychlor	ND	0.050	1
57-74-9	Chlordane	ND	0.050	1
8001-35-2	Toxaphene	ND	0.50	1
12674-11-2	PCB-1016	ND	0.10	1
11104-28-2	PCB-1221	ND	0.20	1
11141-16-5	PCB-1232	ND	0.20	1
53469-21-9	PCB-1242	ND	0.10	1
12672-29-6	PCB-1248	ND	0.10	1
11097-69-1	PCB-1254	ND	0.20	1
11096-82-5	PCB-1260	ND	0.20	1

SURROGATE 1770-80-5 Dibutylchlorendate 91 % Recovery

Received: 08/16/89

Results by Sample

SAMPLE ID S-2-1A H2O

SAMPLE # 02 FRACTIONS: A,B

Date & Time Collected 08/15/89 Category

EXHERB 08/22/89 EXPEST 08/18/89

DATE COMPLETED Date Completed

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-180

Received: 08/16/89 Results by Sample

SAMPLE ID S-2-1A H2O FRACTION 02A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/15/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/18/89 FILE # 719090824 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 1 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.010	1
58-89-9	gamma-BHC (lindane)	ND	0.010	1
319-85-7	beta-BHC	ND	0.010	1
76-44-8	Heptachlor	ND	0.010	1
319-86-8	delta-BHC	ND	0.010	1
309-00-02	Aldrin	ND	0.010	1
1024-57-3	Heptachlor Epoxide	ND	0.010	1
959-98-8	Endosulfan I	ND	0.010	1
72-55-9	4,4'-DDE	ND	0.010	1
60-57-1	Dieldrin	ND	0.010	1
72-20-8	Endrin	ND	0.010	1
72-54-8	4,4'-DDD	ND	0.010	1
33213-65-9	Endosulfan II	ND	0.030	1
50-29-3	4,4'-DDT	ND	0.020	1
7421-93-4	Endrin Aldehyde	ND	0.020	1
1031-07-8	Endosulfan Sulphate	ND	0.050	1
53494-70-5	Endrin Ketone	ND	0.050	1
72-43-5	Methoxychlor	ND	0.050	1
57-74-9	Chlordane	ND	0.050	1
8001-35-2	Toxaphene	ND	0.50	1
12674-11-2	PCB-1016	ND	0.10	1
11104-28-2	PCB-1221	ND	0.20	1
11141-16-5	PCB-1232	ND	0.20	1
53469-21-9	PCB-1242	ND	0.10	1
12672-29-6	PCB-1248	ND	0.10	1
11097-69-1	PCB-1254	ND	0.20	1
11096-82-5	PCB-1260	ND	0.20	1

SURROGATE 1770-80-5 Dibutylchlorendate 107 % Recovery

Received: 08/16/89

Results by Sample

SAMPLE ID S-2-1B H2O

SAMPLE # 03 FRACTIONS: A,B

Date & Time Collected 08/15/89 Category

EXHERB 08/22/89 EXPEST 08/18/89

DATE COMPLETED Date Completed

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-180

Received: 08/16/89 Results by Sample

SAMPLE ID S-2-1B H2O FRACTION 03A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/15/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/18/89 FILE # 719090825 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 1 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.010	1
58-89-9	gamma-BHC (lindane)	ND	0.010	1
319-85-7	beta-BHC	ND	0.010	1
76-44-8	Heptachlor	ND	0.010	1
319-86-8	delta-BHC	ND	0.010	1
309-00-02	Aldrin	ND	0.010	1
1024-57-3	Heptachlor Epoxide	ND	0.010	1
959-98-8	Endosulfan I	ND	0.010	1
72-55-9	4,4'-DDE	ND	0.010	1
60-57-1	Dieldrin	ND	0.010	1
72-20-8	Endrin	ND	0.010	1
72-54-8	4,4'-DDD	ND	0.010	1
33213-65-9	Endosulfan II	ND	0.030	1
50-29-3	4,4'-DDT	ND	0.020	1
7421-93-4	Endrin Aldehyde	ND	0.020	1
1031-07-8	Endosulfan Sulphate	ND	0.050	1
53494-70-5	Endrin Ketone	ND	0.050	1
72-43-5	Methoxychlor	ND	0.050	1
57-74-9	Chlordane	ND	0.050	1
8001-35-2	Toxaphene	ND	0.50	1
12674-11-2	PCB-1016	ND	0.10	1
11104-28-2	PCB-1221	ND	0.20	1
11141-16-5	PCB-1232	ND	0.20	1
53469-21-9	PCB-1242	ND	0.10	1
12672-29-6	PCB-1248	ND	0.10	1
11097-69-1	PCB-1254	ND	0.20	1
11096-82-5	PCB-1260	ND	0.20	1

SURROGATE 1770-80-5 Dibutylchlorendate 120 % Recovery

Received: 08/16/89

Results by Sample

SAMPLE ID MW-7-1 H2O

SAMPLE # 04 FRACTIONS: A,B

Date & Time Collected 08/15/89 Category

EXHERB 08/22/89 EXPEST 08/18/89

DATE COMPLETED Date Completed

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-180

Received: 08/16/89 Results by Sample

SAMPLE ID MW-7-1 H2O FRACTION 04A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/15/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/18/89 FILE # 719090826 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 4 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.040	4
58-89-9	gamma-BHC (lindane)	ND	0.040	4
319-85-7	beta-BHC	ND	0.040	4
76-44-8	Heptachlor	ND	0.040	4
319-86-8	delta-BHC	ND	0.040	4
309-00-02	Aldrin	ND	0.040	4
1024-57-3	Heptachlor Epoxide	ND	0.040	4
959-98-8	Endosulfan I	ND	0.040	4
72-55-9	4,4'-DDE	ND	0.040	4
60-57-1	Dieldrin	ND	0.040	4
72-20-8	Endrin	ND	0.040	4
72-54-8	4,4'-DDD	ND	0.040	4
33213-65-9	Endosulfan II	ND	0.12	4
50-29-3	4,4'-DDT	ND	0.080	4
7421-93-4	Endrin Aldehyde	ND	0.080	4
1031-07-8	Endosulfan Sulphate	ND	0.20	4
53494-70-5	Endrin Ketone	ND	0.20	4
72-43-5	Methoxychlor	ND	0.20	4
57-74-9	Chlordane	ND	0.20	4
8001-35-2	Toxaphene	ND	2.0	4
12674-11-2	PCB-1016	ND	0.40	4
11104-28-2	PCB-1221	ND	0.80	4
11141-16-5	PCB-1232	ND	0.80	4
53469-21-9	PCB-1242	ND	0.40	4
12672-29-6	PCB-1248	ND	0.40	4
11097-69-1	PCB-1254	ND	0.80	4
11096-82-5	PCB-1260	0.88 C	0.80	4

SURROGATE 1770-80-5 Dibutylchlorendate 75 % Recovery

SAMPLE ID MW-8-1 H2O SAMPLE # 05 FRACTIONS: A,B
Date & Time Collected 08/15/89 Category

EXHERB 08/22/89 EXPEST 08/18/89
DATE COMPLETED Date Completed

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-180

Received: 08/16/89 Results by Sample

SAMPLE ID MW-8-1 H2O FRACTION 05A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/15/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/18/89 FILE # 719090830 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 4 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.040	4
58-89-9	gamma-BHC (lindane)	ND	0.040	4
319-85-7	beta-BHC	ND	0.040	4
76-44-8	Heptachlor	ND	0.040	4
319-86-8	delta-BHC	ND	0.040	4
309-00-02	Aldrin	ND	0.040	4
1024-57-3	Heptachlor Epoxide	ND	0.040	4
959-98-8	Endosulfan I	ND	0.040	4
72-55-9	4,4'-DDE	ND	0.040	4
60-57-1	Dieldrin	ND	0.040	4
72-20-8	Endrin	ND	0.040	4
72-54-8	4,4'-DDD	ND	0.040	4
33213-65-9	Endosulfan II	ND	0.12	4
50-29-3	4,4'-DDT	ND	0.080	4
7421-93-4	Endrin Aldehyde	ND	0.080	4
1031-07-8	Endosulfan Sulphate	ND	0.20	4
53494-70-5	Endrin Ketone	ND	0.20	4
72-43-5	Methoxychlor	ND	0.20	4
57-74-9	Chlordane	ND	0.20	4
8001-35-2	Toxaphene	ND	2.0	4
12674-11-2	PCB-1016	ND	0.40	4
11104-28-2	PCB-1221	ND	0.80	4
11141-16-5	PCB-1232	ND	0.80	4
53469-21-9	PCB-1242	ND	0.40	4
12672-29-6	PCB-1248	ND	0.40	4
11097-69-1	PCB-1254	ND	0.80	4
11096-82-5	PCB-1260	1.0 C	0.80	4

SURROGATE 1770-80-5 Dibutylchlorendate 91 % Recovery

Received: 08/16/89

Results by Sample

SAMPLE ID REAGENT BLANK H2O

SAMPLE # 06 FRACTIONS: A

Date & Time Collected not specified Category

EXPEST 08/18/89
Date Completed

SAMPLE ID REAGENT BLANK H2O FRACTION Q6A TEST CODE 608 NAME E608-PEST/PCBs in WATER
Date & Time Collected not specified Category

(1) See Appendix A for Glossary of Report and Data Flag Definitions

Received: 08/16/89

Results by Sample

SAMPLE ID REAGENT BLANK H2O FRACTION 07A TEST CODE 509B NAME Herbicides in water

Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET
HERBICIDES (1)

VERIFIED JD

ANALYST AM EXTRCTD 08/22/89 FILE # 11909054

INSTRMT 1 INJECTD 09/05/89 FACTOR 1 UNITS ug/L

CAS #	COMPOUND	RESULT	DET. LIMIT	FACTOR
94-75-7	2,4-D	ND	0.50	1
93-72-1	2,4,5-TP (Silvex)	ND	0.10	1
93-76-5	2,4,5-T	NA	0.10	1
88-85-7	Dinoseb	NA	0.15	1

SURROGATE

2,4-Dichlorophenyl Acetic Acid 101 % Recovery

(1) See Appendix A for Glossary of Report and Data Flag Definitions

Appendix A

Comments, Notes and Definitions

Radian Work Order: S9-08-180

*

The asterisk(*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.

B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.

C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.

D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

Radian Work Order: S9-08-180

ND
This flag (or <) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added (spiked) to the sample for this analysis.

N\A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

Radian Work Order: S9-08-180

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -	ug/L	micrograms per liter (parts per billion); liquids/water
	ug/Kg	micrograms per kilogram (parts per billion); soils/solids
	ug/M3	micrograms per cubic meter; air samples
	mg/L	milligrams per liter (parts per million); liquids/water
	mg/Kg	milligrams per kilogram (parts per million); soils/solids
	%	percent; usually used for percent recovery of QC standards
	uS/cm	conductance unit; microSiemans/centimeter
	mL/hr	milliliters per hour; rate of settlement of matter in water
	NTU	turbidity unit; nephelometric turbidity unit
	CU	color unit; equal to 1 mg/L of chloroplatinate salt

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-196

Received: 08/18/89

Results By Test

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)	Sample 04 (entered units)	Sample 05 (entered units)
EXHERB Date Completed	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	
EXPEST Date Completed	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED	08/22/89 DATE COMPLETED

TEST CODE default units	Sample 06 (entered units)
EXHERB Date Completed	08/22/89 DATE COMPLETED

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-196

Received: 08/18/89

Results by Sample

SAMPLE ID MW-6-1 H2O

SAMPLE # 01 FRACTIONS: A,B

Date & Time Collected 08/16/89 Category

EXHERB 08/22/89 EXPEST 08/22/89

DATE COMPLETED DATE COMPLETED

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-196

Received: 08/18/89 Results by Sample

SAMPLE ID MW-6-1 H2O FRACTION 01A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/16/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 719090819 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 1.9 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.019	1.9
58-89-9	gamma-BHC (lindane)	ND	0.019	1.9
319-85-7	beta-BHC	ND	0.019	1.9
76-44-8	Heptachlor	ND	0.019	1.9
319-86-8	delta-BHC	ND	0.019	1.9
309-00-02	Aldrin	ND	0.019	1.9
1024-57-3	Heptachlor Epoxide	ND	0.019	1.9
959-98-8	Endosulfan I	ND	0.019	1.9
72-55-9	4,4'-DDE	ND	0.019	1.9
60-57-1	Dieldrin	ND	0.019	1.9
72-20-8	Endrin	ND	0.019	1.9
72-54-8	4,4'-DDD	ND	0.019	1.9
33213-65-9	Endosulfan II	ND	0.057	1.9
50-29-3	4,4'-DDT	ND	0.038	1.9
7421-93-4	Endrin Aldehyde	ND	0.038	1.9
1031-07-8	Endosulfan Sulphate	ND	0.095	1.9
53494-70-5	Endrin Ketone	ND	0.095	1.9
72-43-5	Methoxychlor	ND	0.095	1.9
57-74-9	Chlordane	ND	0.095	1.9
8001-35-2	Toxaphene	ND	0.95	1.9
12674-11-2	PCB-1016	ND	0.19	1.9
11104-28-2	PCB-1221	ND	0.38	1.9
11141-16-5	PCB-1232	ND	0.38	1.9
53469-21-9	PCB-1242	ND	0.19	1.9
12672-29-6	PCB-1248	ND	0.19	1.9
11097-69-1	PCB-1254	ND	0.38	1.9
11096-82-5	PCB-1260	ND	0.38	1.9

SURROGATE 1770-80-5 Dibutylchlorendate 106 % Recovery

Received: 08/18/89

Results by Sample

SAMPLE ID S-4-1 H2O

SAMPLE # 02 FRACTIONS: A,B

Date & Time Collected 08/16/89 Category

EXHERB 08/22/89 EXPEST 08/22/89

DATE COMPLETED DATE COMPLETED

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-196

Received: 08/18/89 Results by Sample

SAMPLE ID S-4-1 H2O FRACTION 02A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/16/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 219090820 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 1.9 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.019	1.9
58-89-9	gamma-BHC (lindane)	ND	0.019	1.9
319-85-7	beta-BHC	ND	0.019	1.9
76-44-8	Heptachlor	ND	0.019	1.9
319-86-8	delta-BHC	ND	0.019	1.9
309-00-02	Aldrin	ND	0.019	1.9
1024-57-3	Heptachlor Epoxide	ND	0.019	1.9
959-98-8	Endosulfan I	ND	0.019	1.9
72-55-9	4,4'-DDE	ND	0.019	1.9
60-57-1	Dieldrin	ND	0.019	1.9
72-20-8	Endrin	ND	0.019	1.9
72-54-8	4,4'-DDD	ND	0.019	1.9
33213-65-9	Endosulfan II	ND	0.057	1.9
50-29-3	4,4'-DDT	ND	0.038	1.9
7421-93-4	Endrin Aldehyde	ND	0.038	1.9
1031-07-8	Endosulfan Sulphate	ND	0.095	1.9
53494-70-5	Endrin Ketone	ND	0.095	1.9
72-43-5	Methoxychlor	ND	0.095	1.9
57-74-9	Chlordane	ND	0.095	1.9
8001-35-2	Toxaphene	ND	0.95	1.9
12674-11-2	PCB-1016	ND	0.19	1.9
11104-28-2	PCB-1221	ND	0.38	1.9
11141-16-5	PCB-1232	ND	0.38	1.9
53469-21-9	PCB-1242	ND	0.19	1.9
12672-29-6	PCB-1248	ND	0.19	1.9
11097-69-1	PCB-1254	ND	0.38	1.9
11096-82-5	PCB-1260	ND	0.38	1.9

SURROGATE 1770-80-5 Dibutylchlorendate 120 % Recovery

Received: 08/18/89

Results by Sample

SAMPLE ID MW-4-1A H2O

SAMPLE # 03 FRACTIONS: A,B

Date & Time Collected 08/17/89 Category

EXHERB 08/22/89 EXPEST 08/22/89

DATE COMPLETED DATE COMPLETED

Received: 08/18/89

Results by Sample

SAMPLE ID MW-4-1A H2O FRACTION 03A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 719090821 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 9.6 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.096	9.6
58-89-9	gamma-BHC (lindane)	ND	0.096	9.6
319-85-7	beta-BHC	ND	0.096	9.6
76-44-8	Heptachlor	ND	0.096	9.6
319-86-8	delta-BHC	ND	0.096	9.6
309-00-02	Aldrin	ND	0.096	9.6
1024-57-3	Heptachlor Epoxide	ND	0.096	9.6
959-98-8	Endosulfan I	ND	0.096	9.6
72-55-9	4,4'-DDE	ND	0.096	9.6
60-57-1	Dieldrin	ND	0.096	9.6
72-20-8	Endrin	ND	0.096	9.6
72-54-8	4,4'-DDD	ND	0.096	9.6
33213-65-9	Endosulfan II	ND	0.29	9.6
50-29-3	4,4'-DDT	ND	0.19	9.6
7421-93-4	Endrin Aldehyde	ND	0.19	9.6
1031-07-8	Endosulfan Sulphate	ND	0.48	9.6
53494-70-5	Endrin Ketone	ND	0.48	9.6
72-43-5	Methoxychlor	ND	0.48	9.6
57-74-9	Chlordane	ND	0.48	9.6
8001-35-2	Toxaphene	ND	4.8	9.6
12674-11-2	PCB-1016	ND	0.96	9.6
11104-28-2	PCB-1221	ND	1.9	9.6
11141-16-5	PCB-1232	ND	1.9	9.6
53469-21-9	PCB-1242	ND	0.96	9.6
12672-29-6	PCB-1248	ND	0.96	9.6
11097-69-1	PCB-1254	ND	1.9	9.6
11096-82-5	PCB-1260	10 C	1.9	9.6

SURROGATE 1770-80-5 Dibutylchlorendate 106 % Recovery

SAMPLE ID MW-4-1B H2O SAMPLE # 04 FRACTIONS: A,B
Date & Time Collected 08/17/89 Category

EXHERB 08/22/89 EXPEST 08/22/89
DATE COMPLETED DATE COMPLETED

RADIAN CORPORATION

 RAS Sacramento REPORT Work Order # S9-08-196

Received: 08/18/89 Results by Sample

SAMPLE ID MW-4-1B H2O FRACTION 04A TEST CODE 608 NAME E608-PEST/PCBs in WATER

Date & Time Collected 08/17/89 Category

ORGANICS ANALYSIS DATA SHEET - PESTICIDES (1)

ANALYST JM EXTRCTD 08/22/89 FILE # 719090822 VERIFIED JD

INSTRMT 7 INJECTD 09/08/89 FACTOR 9.1 UNITS ug/L

CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
319-84-6	alpha-BHC	ND	0.091	9.1
58-89-9	gamma-BHC (lindane)	ND	0.091	9.1
319-85-7	beta-BHC	ND	0.091	9.1
76-44-8	Heptachlor	ND	0.091	9.1
319-86-8	delta-BHC	ND	0.091	9.1
309-00-02	Aldrin	ND	0.091	9.1
1024-57-3	Heptachlor Epoxide	ND	0.091	9.1
959-98-8	Endosulfan I	ND	0.091	9.1
72-55-9	4,4'-DDE	ND	0.091	9.1
60-57-1	Dieldrin	ND	0.091	9.1
72-20-8	Endrin	ND	0.091	9.1
72-54-8	4,4'-DDD	ND	0.091	9.1
33213-65-9	Endosulfan II	ND	0.27	9.1
50-29-3	4,4'-DDT	ND	0.18	9.1
7421-93-4	Endrin Aldehyde	ND	0.18	9.1
1031-07-8	Endosulfan Sulphate	ND	0.46	9.1
53494-70-5	Endrin Ketone	ND	0.46	9.1
72-43-5	Methoxychlor	ND	0.46	9.1
57-74-9	Chlordane	ND	0.46	9.1
8001-35-2	Toxaphene	ND	4.6	9.1
12674-11-2	PCB-1016	ND	0.91	9.1
11104-28-2	PCB-1221	ND	1.8	9.1
11141-16-5	PCB-1232	ND	1.8	9.1
53469-21-9	PCB-1242	ND	0.91	9.1
12672-29-6	PCB-1248	ND	0.91	9.1
11097-69-1	PCB-1254	ND	1.8	9.1
11096-82-5	PCB-1260	11 C	1.8	9.1

SURROGATE 1770-80-5 Dibutylchlorendate 99 % Recovery

Received: 08/18/89

Results by Sample

SAMPLE ID REAGENT BLANK H2O SAMPLE # 05 FRACTIONS: A

Date & Time Collected not specified Category

EXPEST 08/22/89
DATE COMPLETED

SAMPLE ID REAGENT BLANK H2O FRACTION 05A TEST CODE 608 NAME E608-PEST/PCBs in WATER
Date & Time Collected not specified Category

(1) See Appendix A for Glossary of Report and Data Flag Definitions

SAMPLE ID REAGENT BLANK H2O FRACTION Q6A TEST CODE 509B NAME Herbicides in water
Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET
HERBICIDES (1)

VERIFIED JD

ANALYST AM EXTRCTD 08/22/89 FILE # 11909054
INSTRMT 1 INJECTD 09/05/89 FACTOR 1 UNITS ug/L

CAS #	COMPOUND	RESULT	DET. LIMIT	FACTOR
94-75-7	2,4-D	ND	0.50	1
93-72-1	2,4,5-TP (Silvex)	ND	0.10	1
93-76-5	2,4,5-T	NA	0.10	1
88-85-7	Dinoseb	NA	0.15	1

SURROGATE

2,4-Dichlorophenyl Acetic Acid 101 % Recovery

(1) See Appendix A for Glossary of Report and Data Flag Definitions

Appendix A

Comments, Notes and Definitions

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*

The asterisk(*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.

B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.

C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.

D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

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ND
This flag (or <) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added (spiked) to the sample for this analysis.

N\A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

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TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units -

ug/L	micrograms per liter (parts per billion); liquids/water
ug/Kg	micrograms per kilogram (parts per billion); soils/solids
ug/M3	micrograms per cubic meter; air samples
mg/L	milligrams per liter (parts per million); liquids/water
mg/Kg	milligrams per kilogram (parts per million); soils/solids
%	percent; usually used for percent recovery of QC standards
uS/cm	conductance unit; microSiemans/centimeter
mL/hr	milliliters per hour; rate of settlement of matter in water
NTU	turbidity unit; nephelometric turbidity unit
CU	color unit; equal to 1 mg/L of chloroplatinate salt

APPENDIX B

Quality Control Results

TABLE B-1. FIELD AND TRIP BLANK RESULTS FOR METHOD 8240

Parameter	S-2-1B (ug/L)	Trip Blank (ug/L)
Chloromethane	<5.0	<5.0
Bromomethane	<5.0	<5.0
Vinyl chloride	<5.0	<5.0
Chloroethane	<5.0	<5.0
Methylene chloride	3.1[b]	<2.8
Acetone	<7.5	<7.5
Carbon disulfide	<1.7	<1.7
1,1-Dichloroethene	<4.7	<4.7
1,1-Dichloroethane	<2.8	<2.8
1,2-Dichloroethene	<1.6	<1.6
Chloroform	<1.6	<1.6
1,2-Dichloroethane	<2.8	<2.8
2-Butanone	<25	<25
1,1,1-Trichloroethane	<3.8	<3.8
Carbon tetrachloride	<2.8	<2.8
Vinyl acetate	<6.9	<6.9
Bromodichloromethane	<2.2	<2.2
1,2-Dichloropropane	<6.0	<6.0
cis-1,3-Dichloropropene	<5.0	<5.0
Trichloroethene	<1.9	<1.9
Dibromochloromethane	<3.1	<3.1
1,1,2-Trichloroethane	<5.0	<5.0
Benzene	<4.4	<4.4
trans-1,3-Dichloropropene	<5.0	<5.0
2-Chloroethylvinylether	<5.0	<5.0
Bromoform	<4.7	<4.7
2-Hexanone	<36	<36
4-Methyl-2-pentanone	<46	<46
Tetrachloroethene	<4.1	<4.1
1,1,2,2-Tetrachloroethane	<6.9	<6.9
Toluene	<6.0	<6.0
Chlorobenzene	<6.0	<6.0
Ethylbenzene	<7.2	<7.2
Styrene	<3.0	<3.0
Total xylenes	<4.6	<4.6

[b]Detected in reagent blank.

TABLE B-3. SURROGATE RECOVERIES FOR METHOD 8240

Well I.D.	1,2-Dichloroethane-d_4 (% Recovery) (76 - 114)	Toluene-d_8 (% Recovery) (88 - 110)	Bromofluorobenzene (% Recovery) (86 - 115)
MW1-1A	98	103	95
MW-2-1A	107	103	95
MW-2-1B	98	102	99
MW-2-1C	100	102	98
MW-3-1	82	106	100
MW-4-1A	97	102	96
MW-4-1B	101	103	96
MW-5-1A	113	128[q]	97
MW-6-1	102	103	96
MW-7-1	97	126[q]	96
MW-8-1	96	103	95
S-2-1A	97	103	100
S-2-1B	99	104	100
S-4-1	99	104	102
Trip Blank	98	100	95
Number	15	15	15
Mean	99	106	97
Standard Deviation	7	9	2

[q]Reported recovery is outside acceptance criteria.

TABLE B-5. FIELD DUPLICATE RESULTS FOR METHOD 8240

Parameter	MW-4-1A (ug/L)	MW-4-1B (ug/L)	Relative Percent Difference (%)
Chloromethane	<5.0	<5.0	NC
Bromomethane	<5.0	<5.0	NC
Vinyl chloride	<5.0	<5.0	NC
Chloroethane	<5.0	<5.0	NC
Methylene chloride	<2.8	<2.8	NC
Acetone	3.2[j]	4.5[j]	NC
Carbon disulfide	<1.7	<1.7	NC
1,1-Dichloroethene	<4.7	<4.7	NC
1,1-Dichloroethane	<2.8	<2.8	NC
1,2-Dichloroethene	<1.6	<1.6	NC
Chloroform	<1.6	<1.6	NC
1,2-Dichloroethane	<2.8	<2.8	NC
2-Butanone	<25	<25	NC
1,1,1-Trichloroethane	<3.8	<3.8	NC
Carbon tetrachloride	<2.8	<2.8	NC
Vinyl acetate	<6.9	<6.9	NC
Bromodichloromethane	<2.2	<2.2	NC
1,2-Dichloropropane	<6.0	<6.0	NC
cis-1,3-Dichloropropene	<5.0	<5.0	NC
Trichloroethene	<1.9	<1.9	NC
Dibromochloromethane	<3.1	<3.1	NC
1,1,2-Trichloroethane	<5.0	<5.0	NC
Benzene	<4.4	<4.4	NC
trans-1,3-Dichloropropene	<5.0	<5.0	NC
2-Chloroethylvinylether	<5.0	<5.0	NC
Bromoform	<4.7	<4.7	NC
2-Hexanone	<36	<36	NC
4-Methyl-2-pentanone	<46	<46	NC
Tetrachloroethene	<4.1	<4.1	NC
1,1,2,2-Tetrachloroethane	<6.9	<6.9	NC
Toluene	<6.0	<6.0	NC
Chlorobenzene	<6.0	<6.0	NC
Ethylbenzene	<7.2	<7.2	NC
Styrene	<3.0	<3.0	NC
Total xylenes	<4.6	<4.6	NC

[j]Value reported is below laboratory detection limit.

TABLE B-7. FIELD BLANK RESULTS FOR METHOD 8270

Parameter	S-2-1B (ug/L)
N-nitrosodimethylamine	<10
Phenol	<1.5
Aniline	<10
bis(2-Chloroethyl)ether	<5.8
2-Chlorophenol	<3.3
1,3-Dichlorobenzene	<1.9
1,4-Dichlorobenzene	<4.4
Benzyl alocohol	<10
1,2-Dichlorobenzene	<1.9
2-Methylphenol	<10
bis(2-Chloroisopropyl)ether	<5.8
4-Methylphenol	<10
N-nitroso-di-n-propylamine	<10
Hexachloroethane	<1.6
Nitrobenzene	<1.9
Isophorone	<2.2
2-Nitrophenol	<3.6
2,4-Dimethylphenol	<2.7
Benzoic acid	<51
bis(2-chloroethoxy)methane	<5.4
2,4-Dichlorophenol	<2.7
1,2,4-trichlorobenzen	<1.9
Naphthalene	<1.6
4-Chloroaniline	<10
Hexachlorobutadiene	<0.91
4-Chloro-3-methylphenol	<3.0
2-Methylnaphthalene	<10
Hexachlorocyclopentadiene	<6.1
2,4,6-Trichlorophenol	<2.7
2,4,5-Trichlorophenol	<10
2-Chloronaphthalene	<1.9
2-Nitroaniline	<51
Dimethyl phthalate	<1.6
Acenaphthylene	<3.5
3-Nitroaniline	<51
Acenaphthene	<1.9
2,4-Dinitrophenol	<42
4-Nitrophenol	<2.4
Dibenzofuran	<10
2,6-Dinitrotoluene	<1.9
2,4-Dinitrotoluene	<5.8

(Continued)

TABLE B-8. REAGENT BLANK RESULTS FOR METHOD 8270

Parameter	Reagent Blank (ug/L)	Reagent Blank (ug/L)
N-nitrosodimethylamine	<10	<10
Phenol	<1.5	<1.5
Aniline	<10	<10
bis(2-Chloroethyl)ether	<5.7	<5.7
2-Chlorophenol	<3.3	<3.3
1,3-Dichlorobenzene	<1.9	<1.9
1,4-Dichlorobenzene	<4.4	<4.4
Benzyl alocohol	<10	<10
1,2-Dichlorobenzene	<1.9	<1.9
2-Methylphenol	10	<10
bis(2-Chloroisopropyl)ether	<5.7	<5.7
4-Methylphenol	<10	<10
N-nitroso-di-n-propylamine	<10	<10
Hexachloroethane	<1.6	<1.6
Nitrobenzene	<1.9	<1.9
Isophorone	<2.2	<2.2
2-Nitrophenol	<3.6	<3.6
2,4-Dimethylphenol	<2.7	<2.7
Benzoic acid	<50	<50
bis(2-chloroethoxy)methane	<5.3	<5.3
2,4-Dichlorophenol	<2.7	<2.7
1,2,4-trichlorobenzen	<1.9	<1.9
Naphthalene	<1.6	<1.6
4-Chloroaniline	<10	<10
Hexachlorobutadiene	<0.90	<0.90
4-Chloro-3-methylphenol	<3.0	<3.0
2-Methylnaphthalene	<10	<10
Hexachlorocyclopentadiene	<6.0	<6.0
2,4,6-Trichlorophenol	<2.7	<2.7
2,4,5-Trichlorophenol	<10	<10
2-Chloronaphthalene	<1.9	<1.9
2-Nitroaniline	<50	<50
Dimethyl phthalate	<1.6	<1.6
Acenaphthylene	<3.5	<3.5
3-Nitroaniline	<50	<50
Acenaphthene	<1.9	<1.9
2,4-Dinitrophenol	<42	<42
4-Nitrophenol	<2.4	<2.4
Dibenzofuran	<10	<10
2,6-Dinitrotoluene	<1.9	<1.9
2,4-Dinitrotoluene	<5.7	<5.7

(Continued)

TABLE B-9. SURROGATE RECOVERIES FOR METHOD 8270

Well I.D.	2-Fluorophenol (% Recovery) (21 - 100)	Phenol-d_5 (% Recovery) (10 - 94)	Nitrobenzene-d_5 (% Recovery) (35 - 114)	2-Fluorobiphenyl (% Recovery) (43 - 116)	2,4,6-Tribromophenol (% Recovery) (10 - 123)	Terphenyl-d_{14} (% Recovery) (33 - 141)
MW1-1A	72	86	77	71	92	90
MW-2-1A	57	43	88	84	56	81
MW-2-1B	94	64	94	79	61	82
MW-2-1C	88	62	89	89	66	81
MW-3-1	68	97[q]	90	60	75	71
MW-4-1A	66	80	70	69	86	79
MW-4-1B	75	93	79	79	103	89
MW-5-1A	49	78	68	66	79	77
MW-6-1	62	70	75	79	61	75
MW-7-1	56	68	90	83	82	95
MW-8-1	61	68	78	81	86	100
S-2-1A	130[q]	87	85	79	101	86
S-2-1B	122[q]	95[q]	87	77	89	95
S-4-1	98	76	82	79	85	87
Number	14	14	14	14	14	14
Mean	78	76	82	77	80	85
Standard Deviation	26	16	8	8	15	9

[q]Reported recovery is outside acceptance limits.

TABLE B-11. FIELD DUPLICATE RESULTS FOR METHOD 8270

Parameter	MW-4-1A (ug/L)	MW-4-1B	Relative Percent Difference (%)
N-nitrosodimethylamine	<10	<10	NC
Phenol	<1.5	<1.5	NC
Aniline	<10	<10	NC
bis(2-Chloroethyl)ether	<5.7	<5.7	NC
2-Chlorophenol	<3.3	<3.3	NC
1,3-Dichlorobenzene	<1.9	<1.9	NC
1,4-Dichlorobenzene	<4.4	<4.4	NC
Benzyl alocohol	<10	<10	NC
1,2-Dichlorobenzene	<1.9	<1.9	NC
2-Methylphenol	<10	<10	NC
bis(2-Chloroisopropyl)ether	<5.7	<5.7	NC
4-Methylphenol	<10	<10	NC
N-nitroso-di-n-propylamine	<10	<10	NC
Hexachloroethane	<1.6	<1.6	NC
Nitrobenzene	<1.9	<1.9	NC
Isophorone	<2.2	<2.2	NC
2-Nitrophenol	<3.6	<3.6	NC
2,4-Dimethylphenol	<2.7	<2.7	NC
Benzoic acid	<51	<51	NC
bis(2-chloroethoxy)methane	<5.4	<5.4	NC
2,4-Dichlorophenol	<2.7	<2.7	NC
1,2,4-trichlorobenzen	<1.9	<1.9	NC
Naphthalene	<1.6	<1.6	NC
4-Chloroaniline	10	<10	NC
Hexachlorobutadiene	<0.90	<0.90	NC
4-Chloro-3-methylphenol	<3.0	<3.0	NC
2-Methylnaphthalene	<10	<10	NC
Hexachlorocyclopentadiene	<6.0	<6.0	NC
2,4,6-Trichlorophenol	<2.7	<2.7	NC
2,4,5-Trichlorophenol	<10	<10	NC
2-Chloronaphthalene	<1.9	<1.9	NC
2-Nitroaniline	<50	<50	NC
Dimethyl phthalate	<1.6	<1.6	NC
Acenaphthylene	<3.5	<3.5	NC
3-Nitroaniline	<50	<50	NC
Acenaphthene	<1.9	<1.9	NC
2,4-Dinitrophenol	<42	<42	NC
4-Nitrophenol	<2.4	<2.4	NC

(Continued)

TABLE B-12. MATRIX SPIKE DUPLICATE RESULTS FOR METHOD 8270

Parameter	MW-2-1b (% Recovery)	MW-2-1c (% Recovery)	Relative Percent Difference (%)
Phenol	65	64	2
2-Chlorophenol	70	78	11
N-nitroso-di-n-propylamine	72	74	3
1,4-Dichlorobenzene	59	64	8
1,2,4-Trichlorobenzene	81	84	4
4-Chloro-3-methylphenol	63	67	6
Acenaphthene	84	88	5
4-Nitrophenol	124[q]	147[q]	17
2,4-Dinitrotoluene	95	102[q]	7
Pentachlorophenol	58	63	8
Pyrene	73	70	4

[q]Reported recovery is outside acceptance criteria.

TABLE B-14. REAGENT BLANK RESULTS FOR METALS

Parameter	Reagent Blank (mg/L)
Silver	<0.007
Aluminum	<0.053
Arsenic	<0.004
Barium	<0.002
Beryllium	<0.001
Calcium	0.016[b]
Cadmium	<0.004
Cyanide	<0.02
Cobalt	<0.007
Chromium	<0.007
Copper	<0.006
Iron	0.008[b]
Mercury	<0.0002
Potassium	<3
Magnesium	<0.03
Manganese	<0.002
Sodium	<0.029
Nickel	<0.015
Lead	<0.002
Antimony	<0.034
Selenium	<0.004
Thallium	<0.051
Vanadium	<0.008
Zinc	<0.002

[b]Detected in the reagent blank.

TABLE B-15. (Continued)

Parameter	Percent Recovery (%)
Selenium	0[q]
Selenium	0[q]
Thallium	78[q]
Thallium	75[q]
Vanadium	97
Vanadium	99
Zinc	98
Zinc	98

[q]Reported recovery is outside acceptance criteria.
[a]Spike level was less than 25% of unspiked sample value. These results cannot be judged.

TABLE B-17. MATRIX SPIKE DUPLICATE RESULTS FOR METALS

Parameter	MW-2-1B (% Recovery)	MW-2-1C (% Recovery)	Relative Percent Difference (%)
Silver	95	96	1
Aluminum	106	108	2
Arsenic	81[q]	84[q]	4
Barium	99	101	2
Beryllium	99	102	3
Calcium	96	180[q]	61[b]
Cadmium	98	97	1
Cyanide	88	91	3
Cobalt	100	102	2
Chromium	100	102	2
Copper	100	102	2
Iron	108	104	4
Mercury	106	103	3
Potassium	110	58[q]	62[a]
Magnesium	94	76[q]	21[b]
Manganese	101	104	3
Sodium	87	160[q]	59[b]
Nickel	97	106	9
Lead	42[q]	42[q]	0
Antimony	93	102	9
Selenium	0[q]	0[q]	0
Thallium	78[q]	75[q]	4
Vanadium	97	99	2
Zinc	98	98	0

[q]Reported recovery is outside acceptance criteria.
[a]Relative percent difference is outside acceptance criteria.
[b]Spike level was less than 25% of unspiked sample value. These results cannot be judged.

TABLE B-19. FIELD BLANK RESULTS FOR METHOD 8080

Parameter	S-2-1B (ug/L)
alpha-BHC	<0.010
gamma-BHC	<0.010
beta-BHC	<0.010
Heptachlor	<0.010
delta-BHC	<0.010
Aldrin	<0.010
Heptachlor Epoxide	<0.010
Endosulfan I	<0.010
4,4'-DDE	<0.010
Dieldrin	<0.010
Endrin	<0.010
4,4'-DDD	<0.010
Endosulfan II	<0.030
4,4'-DDT	<0.020
Endrin Aldehyde	<0.020
Endosulfan Sulphate	<0.050
Endrin Ketone	<0.050
Methoxychlor	<0.050
Chlordane	<0.050
Toxaphene	<0.50
PCB-1016	<0.10
PCB-1221	<0.20
PCB-1232	<0.20
PCB-1242	<0.10
PCB-1248	<0.10
PCB-1254	<0.20
PCB-1260	<0.20

TABLE B-21. FIELD DUPLICATE RESULTS FOR METHOD 8080

Parameter	MW-4-1A (ug/L)	MW-4-1B (ug/L)	Relative Percent Difference[a] (%)	MW-2-1A (ug/L)	MW-2-1B (ug/L)	MW-2-1C (ug/L)	Coefficient of Variation[b] (%)
alpha-BHC	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
gamma-BHC	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
beta-BHC	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
Heptachlor	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
delta-BHC	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
Aldrin	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
Heptachlor Epoxide	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
Endosulfan I	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
4,4'-DDE	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
Dieldrin	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
Endrin	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
4,4'-DDD	<0.096	<0.091	NC	<0.04	<0.04	<0.04	NC
Endosulfan II	<0.29	<0.27	NC	<0.12	<0.12	<0.12	NC
4,4'-DDT	<0.19	<0.18	NC	<0.08	<0.08	<0.08	NC
Endrin Aldehyde	<0.19	<0.18	NC	<0.08	<0.08	<0.08	NC
Endosulfan Sulphate	<0.48	<0.46	NC	<0.2	<0.2	<0.2	NC
Endrin Ketone	<0.48	<0.46	NC	<0.2	<0.2	<0.2	NC
Methoxychlor	<0.48	<0.46	NC	<0.2	<0.2	<0.2	NC
Chlordane	<0.48	<0.46	NC	<0.2	<0.2	<0.2	NC
Toxaphene	<4.8	<4.6	NC	<2	<2	<2	NC
PCB-1016	<0.96	<0.91	NC	<0.4	<0.4	<0.4	NC
PCB-1221	<1.9	<1.8	NC	<0.8	<0.8	<0.8	NC
PCB-1232	<1.9	<1.8	NC	<0.8	<0.8	<0.8	NC
PCB-1242	<0.96	<0.91	NC	<0.4	<0.4	<0.4	NC
PCB-1248	<0.96	<0.91	NC	<0.4	<0.4	<0.4	NC
PCB-1254	<1.9	<1.8	NC	<0.8	<0.8	<0.8	NC
PCB-1260	10	11	10	1.1	<0.8	<0.8	NC

[a]Relative Percent Difference (RPD)(%) = Difference/Mean x 100

[b]Coefficient of Variation (CV)(%) = Standard Deviation/Mean x 100.

NC - Cannot be calculated.

TABLE B-23. FIELD BLANK RESULTS FOR METHOD 8150

Well I.D.	2,4-D (ug/L)	2,4,5-TP (ug/L)
S-2-1B	<1	<0.2

TABLE B-25. FIELD DUPLICATE RESULTS FOR METHOD 8150

Well I.D.	2,4-D (ug/L)	2,4,5-TP (ug/L)
MW-4-1A	<2	<0.4
MW-4-1B	<2	<0.4
Relative Percent Difference[a]	NC	NC
MW-2-1A	<1	<0.2
MW-2-1B	<1	<0.2
MW-2-1C	<1	<0.2
Coefficient of Variation[b]	NC	NC

[a]Relative Percent Difference = Difference/Mean x 100.

[b]Coefficient of Variation = Standard Deviation/Mean x 100.

NC - Cannot be calculated.