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REPORTS

DATE: 1989



P O BOX 1492 EL PASO, TEXAS 79978 PHONE 915-541-2600

August 28, 1989

Mr. David G. Boyer Environmental Bureau Chief New Mexico Oil Conservation Division 310 Old Santa Fe Trail Suite 206 Santa Fe, New Mexico 87504

Subject: Investigation Report of the Manana - Mary Wheeler Site

Dear David:

1

Enclosed are two copies of the report by K.W. Brown and Associates on the site near Flora Vista. After you have had a chance to review it, we will be happy to get together with you and discuss the remediation. Henry Van or I will be happy to answer any questions you might have on the report in the interim.

Received

OCT - 2 1989

OIL CONSERVATION DIV. SANTA FE Sincerely yours,

Kenneth E. Beasley Manager of Compliance Engineering, North Region SITE INVESTIGATION OF THE MANANA - MARY WHEELER #1-E WELL SITE NEAR FLORA VISTA, NEW MEXICO

prepared for

El Paso Natural Gas Company El Paso, Texas

by

K. W. Brown & Associates, Inc. 6 Graham Road College Station, Texas 77840

Uses and USED

OCT - 2 1989

OIL CONSERVATION DIV. SANTA FE

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September, 1989

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EXECUTIVE SUMMARY

Manana Gas, Inc., (Albuquerque, New Mexico), operates a producing natural gas well in the town of Flora Vista, New Mexico, in an area directly adjacent to the Animas River. The well, Mary Wheeler #1-E, was first pressed into service in July of 1980, with the gas being purchased by El Paso Natural Gas Company (EPNG, El Paso, Texas). Located hydrologically-downgradient of the gas production units lies a domestic water well field operated by the Flora Vista Water Users Association. Through (routine well site management practices) the alluvial aquifer in which the water production wells are screened became contaminated with hydrocarbon liquids.

> Hydrocarbons were detected in at least one water well, S-1, in February of 1983. Throughout the early and mid-1980s, several investigators, including the New Mexico Oil Conservation Division (OCD), have been involved in efforts aimed at isolating the exact source of the contamination.

> The intent of this report is to: 1) consolidate hydrologic and chemical site-specific data developed during previous investigatory efforts, 2) provide documentation of the K. W. Brown & Associates, Inc. (KWB&A) site investigation conducted in response to OCD's June 15, 1988, directives (Boyer, 1988), and 3) offer a framework upon which site reclamation measures can be implemented.

> The investigation of the Manana - Mary Wheeler #1-E well site began with a desktop effort, whereby existing information from OCD and EPNG files was compiled and studied in an effort to guide the subsequent field work and analytical testing.

> Following this task, trenches were excavated via backhoe to expose the unsaturated, cobbley sand beneath the site to aid in the evaluation of the extent of subsurface hydrocarbon contamination. A structured soil sampling program was conducted concurrent with the trenching exercise, in which a sample of soil was collected from the saturated/unsaturated zone interface at three locations in the trenches: one at each end, and one in the approximate center of the pit.

> Once the excavation phase was complete, four new groundwater monitoring wells were installed at about the same level as the existing onsite monitoring wells. With the exception of the upgradient well, these wells were positioned inside the area where hydrocarbon staining was visible. Groundwater samples were taken from these new wells, the existing monitoring wells, and from selected inactive water production wells.

> Soil and groundwater samples were submitted to an analytical laboratory for analysis of selected metals, inorganics, and organic constituents.

Visual inspection of the dehydrator pit area, exposed during trenching activities, indicated the presence of hydrocarbon contamination of the soil between the ground surface and the water table. Oily materials were noted from a level as shallow as 12 inches below the ground surface, to as deep as 5.4 feet, which coincided with the water table in this area.

The major constituents detected in soil samples taken from trenches excavated in the dehydrator pit area were oil and grease; the aromatic volatiles, benzene, toluene, xylene, and chlorobenzene; and the polynuclear aromatic hydrocarbons, fluoranthene and chrysene.

Based on the results of the soil and groundwater sampling and analysis program, and on a review of the operating records of the production units, it appears that the principal source for the hydrocarbon contamination at the Manana - Mary Wheeler #1-E well site is the unlined dehydrator pit.

A significant contrast in chromium concentration between soil samples taken near the area believed to be the reserve pit, and the balance of the soil samples, suggests that chromium is present in this area at levels above what is considered to be characteristic of background conditions. Also, owing to the fact that chromium is a component of certain drilling mud additives, it appears likely that the trenches excavated in this area were located, at least in part, inside the boundaries of the drilling mud reserve pit. Buried debris, such as concrete fragments and scrap pipe, unearthed during the trenching effort, serves to substantiate the claim that the reserve pit had been identified during the site investigation.

An analysis of groundwater samples collected from the newly-installed monitoring wells, OCD's monitoring wells, and selected production wells, indicates that the greatest concentration of volatile organic compounds lies within the bounds of the visible hydrocarbon plume.

Methylene chloride, a commonly-used laboratory solvent, was detected in three groundwater samples, all of which are located outside the plume boundaries. It is very likely that the identification of this compound can be attributed to its usage in sample container decontamination by the analytical laboratory.

Based on the results of a risk assessment, and on the findings of the site investigation, it is recommended that EPNG proceed with excavation of visibly-contaminated soils.

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Manana Gas, Inc., (Albuquerque, New Mexico), operates a producing natural gas well in the town of Flora Vista, New Mexico, in an area directly adjacent to the Animas River. The well, Mary Wheeler #1-E, was first pressed into service in July of 1980, with the gas being purchased by El Paso Natural Gas Company (El Paso, Texas). Located hydrologicallydowngradient of the gas production units lies a domestic water well field operated by the Flora Vista Water Users Association. Through routine well site management practices the alluvial aquifer in which the water production wells are screened became contaminated with hydrocarbon liquids.

Hydrocarbons were detected in at least one water well, S-1, in February of 1983. Throughout the early and mid-1980s, several investigators, including the New Mexico Oil Conservation Division (OCD), have been involved in efforts aimed at isolating the exact source of the contamination. Conventional exploratory activities carried out by OCD and others led to the realization that a production unit termed the dehydrator pit was the most likely source of contamination.

This report, entitled "Site Investigation of the Manana - Mary Wheeler #1-E Well Site Near Flora Vista, New Mexico," serves to: 1) consolidate hydrologic and chemical site-specific data developed during previous investigatory efforts, 2) provide documentation of the K. W. Brown & Associates, Inc. (KWB&A) site investigation conducted in response to OCD's June 15, 1988, directives (Boyer, 1988), and 3) offer a framework upon which site reclamation measures can be implemented.

Comprised of six sections, this document provides a detailed account of the activities that took place on-site from the time in which the gas well first became operational, until the conclusion of the latest site

investigation. Section 2.0 chronicles the environmental aspects of the well site activities, while Section 3.0 includes a discussion of the site investigation conducted by KWB&A. Following the site investigation, the analytical data generated during this exercise were used to formulate a risk assessment, the results of which are reported in Section 4.0. Section 5.0 provides a listing of the conclusions borne out by the site investigation/risk assessment elements.

Finally, a remedial action plan is included as the last section of this report (Section 6.0). Since much of the information presented in Sections 2.0 through 5.0 are considered to be germane to developing a site reclamation program, the remedial action plan has been included as the closing discussion.

2.0 HISTORICAL BACKGROUND

This section provides background on the Manana - Mary Wheeler #1-E gas well site. This background includes a description and comprehensive historical perspective of the well site, which is operated by Manana Gas, Inc. of Albuquerque, New Mexico. Included in the discussion is a chronology of the events that led to the contamination of S-1, a watersupply well owned and operated by the Flora Vista (New Mexico) Water Users Association.

2.1 DESCRIPTION OF SITE

The Mary Wheeler #1-E well site, located in the town of Flora Vista, New Mexico (Figure 2-1), presently consists of a producing gas well, an oil storage tank, a produced water tank, and a gas dehydrator (Plate 1, Appendix A). Southwest of the gas well units are the Flora Vista Water Users Association (FVWUA) production wells and associated pumping equipment. The Animas River lies approximately 100 feet east of the well head, and an active alfalfa farming operation is directly adjacent to the production units on the west.

Four hundred seventy feet north of the gas well is a well owned by the FVWUA, S-4, that is believed to be dormant at the present time. Beginning at the gas well head and proceeding southwest, the first FVWUA well to be encountered is S-1, located 250 feet southwest of the gas well. Next is SX-1, an exploratory well that has never been placed into service as a producing water well. Continuing southwest from SX-1, SX-2, another unused exploration well, is the next well to be encountered, followed by S-5, the pump house, S-2 (active), S-3, and S-7 (active). Production well S-6, an active well, lies 210 feet due north of S-3. Unless noted otherwise, the



FIGURE 2-1. MAP SHOWING LOCATION OF THE MAÑANA - MARY WHEELER #I-E WELL SITE.

majority of the production wells/exploration wells are not actively being pumped.

Topography at the site is generally characterized as flat, as the production units and the water well field are located on a point bar deposit of the Animas River. There are numerous cottonwood trees scattered about the area, and there is a thick section of brush between the well field and the river. Surface deposits consist of cobbley sand, with the coarser-grained fractions approaching boulder-size dimensions. More detail regarding geologic conditions at the site can be found in Section 3.0.

Also present at the site are five groundwater monitoring wells installed by OCD in March of 1985. Of these five wells, two have filled-up with silt/sand (OCD-2 and OCD-4; see Plate 1) and are, in their present state, unusable. Five additional monitoring wells were installed by KWB&A as part of this investigation. These wells can also be found on Plate 1, and details regarding their method of construction can be found in Section 3.2.

2.2 CHRONOLOGY OF WELL SITE OPERATIONS: 1979 TO THE PRESENT

Table 2-1 contains a comprehensive listing of activities at the Manana Mary Wheeler #1-E gas well site, beginning with the drilling and subsequent start-up of the well, followed by the date when contamination was first suspected at S-1. Also described in this table, are the events that occurred in response to the investigation by OCD, and others, of the contamination incident. Following is a brief discussion of the more significant events listed in the table.

Permission was granted to Manana by OCD on December 26, 1979, to drill the Mary Wheeler #1~E gas well. Seven months later, on July 16, 1980, the well was placed on-line and began delivering natural gas via pipeline to El

Table 2-1. Manana - Mary Wheeler #1-E Well Site Contamination History.

Date	Event
12/26/79	Permission granted to Manana by OCD to drill Mary Wheeler #1-E gas well
Jan-80	Mary Wheeler #1-E gas well drilled
7/16/80	Mary Wheeler #1-E gas well placed into service
Jul-80	Vapor line from the still column, the glycol storage vent, and the liquid phase dump
,	line all routed to an unlined pit immediately south of the dehydrator
Feb-83	Contamination in Flora Vista Water Users Association (FVWUA) production well S-1
	first detected
Feb-83	Backhoe pits dug by FVWUA through August of 1983
	The vapor line from the still column is re-routed into a 55-gallon drum placed inside
Summer 1965	the unlined pit. The liquid phase dump line is re-routed to a pipeline leading to
0 /1 /00	Manana's tank. The glycol storage vent is still positioned over unlined pit.
8/1/83	Chemical analysis of samples taken from FVWUA pits and from production wells
	S-1, -2, and -3
8/22/83	Chemical analysis of samples taken from production wells S-2, -3, and -4, and from
	the Animas River
8/23/83	Chemical analysis of samples taken from production well S-1, Manana's oil/water
	separator, El Paso Natural Gas' (EPNG) glycol dehydrator, and from a pit possibly
· · · · · · · · · · · · · · · · · · ·	dug at an earlier date by the FVWUA
Summer 1984	OCD attempts to install ground water monitoring wells at the Mary Wheeler #1-E well
	site with a hollow-stem auger drilling rig; unfavorable geologic conditions led to failure
	of this effort
1/25/85	New Mexico congressman Don Silva requests information from OCD pertaining to
	the Flora Vista incident
2/28/85	Dave Boyer of OCD meets with Dick Thurstonson of the FVWUA and Richard
	Cheney of Lawrence A. Brewer & Associates, Inc. at the Mary Wheeler #1-E gas
	well location
3/19/85	OCD installs groundwater monitoring wells OCD-1 through OCD-5. Samples taken
• • •	from the new monitoring wells and S-1, S-5, and the Animas River and a system
	composite is taken on March 20
6/28/85	OCD samples OCD-1 through OCD-5, and S-1; OCD wells are possibly
	contaminated by an air compressor used to develop wells
8/5/85	OCD samples S-5 and takes system composite sample
9/20/85	OCD samples S-5
9/21/85	OCD samples S-5 and OCD-1 through OCD-5; contaminants detected in OCD-1, -2,
3/21/05	'-3, and -5, and S-5, are possibly a result of additional well development with a
	different air compressor. Fiberglass tank at the separator is also sampled
10/25/85	OCD samples S-1 and OCD-1 through OCD-5, takes system composite sample,
10/25/85	
1/17/0/	and samples the fiberglass tank at the separator
1/17/86	OCD samples OCD-1 through OCD-5, and S-5, takes system composite sample,
	and samples the 55-gallon drum at the dehydrator
Jan-86	OCD completes progress report on Flora Vista incident
2/28/86	OCD samples the 55-gallon drum at the dehydrator
4/21/86	OCD begins a 72-hour pump test on S-1; samples also taken from OCD-1 through
	OCD-5, and S-1 and S-5
4/21/86	OCD samples S-5 and OCD-1 through OCD-5
4/22/86	OCD samples S-1
4/23/86	OCD samples fiberglass tank at the oil storage tank
4/24/86	OCD samples S-1
4/25/86	OCD samples S-5, OCD-1 through OCD-5, and takes a system composite sample;
	dichloromethane (a laboratory solvent) detected in composite sample was a
	possible result of vial contamination by sample bottle vendor
5/21/86	IUCD takes a system composite sample, and samples the neerglass tank at the
5/21/86	OCD takes a system composite sample, and samples the fiberglass tank at the oil storage tank
5/21/86	OCD takes a system composite sample, and samples the fiberglass tank at the oil storage tank OCD conducts short-duration pump test (i.e., 5.6 hours) on S-1

Table 2-1 (cont.). Manana - Mary Wheeler #1-E Well Site Contamination History.

Date	Event
Dec-86	EPNG turns off dehydrator, disconnects vapor line from still column and glycol storage
I	vent, and plugs all vents
3/27/87	W.B. Martin & Associates, Inc. conducts an investigation of the reserve pit area,
	and drills a boring 15 feet southwest of S-4
Spring 1987	EPNG returns dehydrator to service, re-installs vent lines, and routes same to 55-
	gallon drum inside unlined pit
Jun-87	EPNG back-fills unlined pit south of dehydrator, and removes the dehydrator from service
8/18/87	R.W. Blair, Jr. conducts trenching exercise in an effort to obtain the extent of
	subsurface contamination; investigation continues through 8/19/87
10/28/87	EPNG sends memorandum to OCD describing the history of the Mary Wheeler #1-E
	gas well operations
6/15/88	OCD sends EPNG memorandum outlining requirements for the Flora Vista
	contamination investigation and remedial action plan
9/15/88	Manana settles with the FVWUA for \$25,000
2/14/89	OCD sends EPNG second memorandum outlining requirements for the Flora Vista
	contamination investigation and remedial action plan
6/2/89	Meeting between OCD, K.W. Brown & Associates, Inc. (KWB&A), and EPNG to
	collect information from OCD's files concerning the Flora Vista site, and to
	discuss the technical approach to be followed during the site investigation
6/12/89	KWB&A excavates trenches to evaluate the extent of subsurface contamination, and
	installs 5 groundwater monitoring wells to collect additional water quality data

Paso Natural Gas Company (EPNG). At this time, EPNG routed the vapor line from the still column, the glycol storage vent line, and the liquid phase dump line to an unlined pit located directly south of the dehydrator unit.

As of October, 1986, the Flora Vista Water Users Association served approximately 1,500 residents and small businesses through 431 connections. The average system delivery during 1983 was about 100,000 gallons per day (GPD). The FVWUA well field was first pressed into service in 1981, with two production wells, each equipped with pumps capable of delivering 60 to 70 gallons per minute (GPM) (Boyer, 1986).

In response to the degradation of the quality of water pumped from S-1, the FVWUA initiated an investigation to uncover the source of contamination, lasting from February of 1983 to August of that year. Although detailed information regarding this investigation is unavailable, it is believed that the FVWUA excavated several pits with a backhoe, and took soil and groundwater samples to be subjected to chemical analysis. Samples were also taken and analyzed of produced fluids contained in Manana's oil/water separator and in EPNG's dehydrator.

At some point in the summer of 1983, EPNG re-routed the vapor line from the still column into a 55-gallon drum, which it placed inside the unlined pit. In addition, El Paso re-routed the liquid phase dump line to a pipeline leading to Manana's tank. The glycol storage vent line remained positioned over the unlined pit.

In the summer of 1984, OCD attempted to install groundwater monitoring wells on-site with a hollow-stem auger. Due to the abundance of large cobbles and boulders in the subsurface, however, this operation was abandoned since the drilling rig could not penetrate the geologic material. In March of the following year (1985), OCD was successful in installing

five monitoring wells with a backhoe. Additional information regarding this effort can be found in Section 2.3.3.

Groundwater samples were taken periodically by OCD from the monitoring wells, S-1, S-5, and the water supply system tap (representing a system composite), from March of 1985 to April of 1986. Occasionally, fluids were sampled from several of the production units throughout this period.

Efforts by OCD to develop the newly-installed groundwater monitoring wells in June and September of 1985 resulted in suspected contamination of the water inside the well casings, as gasoline-powered air compressors were used on each occasion to rapidly remove groundwater and sediment from each well. It is likely that gasoline combustion by-products produced by the air compressor entered the air stream, which subsequently contaminated the water inside the well. Thus, the chemical analyses of the groundwater samples taken on these dates cannot be deemed a reliable indicator of water quality during those times.

OCD completed a progress report on its activities at the Mary Wheeler #1-E well site in January of 1986 (Appendix B). A significant conclusion of that report indicated that no verifiable contamination was detected in 1985 in either the unused production wells or the monitoring wells, except for the periods in which the air compressors were used for well development. OCD recommended that exploratory excavating be done in an effort to identify the presence of oil or hydrocarbons between the dehydrator pit and S-1. Finally, OCD suggested that a 72-hour pump test on S-1 be conducted to evaluate the performance of the alluvial aquifer, and to verify that pumping S-1 would mobilize free-phase or dissolved hydrocarbons lying adjacent to that well's screen.

Beginning on April 22, 1986, OCD conducted a 72-hour pump test on S-1, in which that well would be pumped for 48 hours, and recovery would then be

observed for 21 hours. Throughout the duration of the pump test, groundwater samples were withdrawn from the monitoring wells (i.e., OCD-1 through -5), S-1, S-5, and the supply system tap. Further information regarding the pump test can be found in Section 2.3.4.

OCD issued its final report on the Flora Vista project in October of 1986 (Appendix C). Conclusions of that report suggest that oil and dissolved hydrocarbons remain in the sediments immediately adjacent to S-1, and that pumping of this well at production rates would likely cause continued migration of contaminants into the wellbore. OCD recommended that S-5 be pumped for a period of time sufficient to sample fresh formation fluids, draw a sample of groundwater from this well, and analyze for aromatic hydrocarbons, chloride, and total dissolved solids (TDS). OCD intimated that additional extensive site work, including soil excavation, may be needed to determine the threat of contamination to other production wells.

In December, 1986, EPNG turned the dehydrator off, and disconnected the vapor line from the still column and the glycol storage vent line, and plugged all vents.

On March 27, 1987, W. B. Martin & Associates, Inc., of Farmington, NM, conducted a brief site investigation of the reserve pit area, and drilled a soil boring 15 feet to the southwest of S-4. The conclusions of this study are not clear at this time, however. A report describing this investigation is available in Appendix D.

EPNG, in the spring of 1987, returned the dehydrator to service, reinstalled the vent lines, and routed these lines to the aforementioned 55gallon drum placed inside the dehydrator pit.

In June of 1987, EPNG once again removed the dehydrator from service, and back-filled the unlined pit south of the dehydrator.

Two months later, on August 18, 1987, R. W. Blair, Jr., initiated a trenching exercise at the Mary Wheeler #1-E well site in an effort to ascertain the extent of subsurface contamination. Thirteen pits were dug with a backhoe and, of those 13, 6 were noted to contain oil or hydrocarbons. A copy of this report is available in Appendix E.

On June 15, 1988, OCD sent a memorandum to EPNG outlining its technical requirements for further study of the Flora Vista site, including remedial action. Included in this document is a requirement for additional study of S-5, the area accommodating the dehydrator pit and other pits (e.g., tank drain, blowdown), the area between S-1 and the Mary Wheeler #1-E well site, and the area between S-1 and the remaining production wells. There is also a request for an investigation of the reserve or "slush" pit. The location of this pit was not readily known at the outset of the instant investigation, as it had been covered over for several years prior to the issuance of this memo.

The FVWUA agreed to an out-of-court settlement of \$25,000 with Manana in September, 1988.

OCD sent EPNG an additional memorandum on February 14, 1989, reaffirming its technical requirements for continued study and reclamation of the Mary Wheeler #1-E well site. This document followed the submission of a proposal by EPNG addressing the requirements listed in the June 15, 1988 memo.

On June 2, 1989, EPNG and K. W. Brown & Associates, Inc. (KWB&A), a consulting firm representing EPNG, met with OCD to exchange information pertinent to the Flora Vista project, and to discuss the technical approach to be followed during the site investigation.

Beginning on June 12, 1989, KWB&A initiated a site investigation, whereby several trenches were dug via backhoe, additional groundwater monitoring wells were installed with the aid of a rotary-wash drilling rig, and the requirements listed by OCD were addressed. Details regarding the site investigation are located in Section 3.0.

2.3 PREVIOUS INVESTIGATORY WORK

Having briefly reviewed the chronology of the Manana - Mary Wheeler #1-E well site, it is appropriate here to recount the details of work conducted to date at the well site by OCD, the FVWUA, and others. These efforts mainly involved attempts at identifying the source, or sources, of the hydrocarbon contamination first detected in S-1. Once these regions had been identified, ensuing investigations were aimed at characterizing the subsurface environment which had been impacted by the contamination event, or events.

2.3.1 FVWUA Groundwater Sampling

During the early 1980s, the FVWUA and its consultant, L. A. Brewer and Associates, Inc. (Farmington, New Mexico), conducted routine water quality sampling of its production water wells. It was through these efforts, and probably through complaints from water system users, that the contamination of S-1 was first detected. Table 2-2 provides a listing of the results of these early sampling episodes. The availability of water quality records is somewhat limited, and it is very likely that Table 2-2 is a subset of the entire FVWUA/Brewer & Associates, Inc. water quality data base from this time period.

2.3.2 Blair Trenching Exercise

On August 18 and 19, 1987, Dr. R. W. Blair, Jr., from the Department of Geology, Fort Lewis College, Durango, Colorado, representing Brewer &

	S-1	[S-	2	S-	3
	Date Sa	mpled	Date Sa	mpled	Date Sa	mpled
Parameter	8/10/83	N/A	8/22/83	N/A	10/8/81	8/22/83
Metals (ppm):						
Ag			< 0.003			1.2
AÌ	2.21					
As	1.56		0.02			0.09
В	< 0.004					
Ba	<0.005		<0.005			0.0
Co	< 0.003					
Cd	<0.002		<0.002			< 0.002
Cr	< 0.005		<0.005			0.03
Cu	<0.002					
Fe	0.15	0.2		0.3		
Hg	0.63		< 0.002	ļ		< 0.002
Mn	0.32	0.57		0.7	1.39	
Мо	<0.005					
Ni	<0.01					
Pb	< 0.001		< 0.001			0.25
Se	< 0.002		< 0.002		1	< 0.002
Zn	< 0.004				Į	
Soluble Cations (ppm):						
Ca					121	
K					1.7	
Mg	20.75				10	
Na					34	
Soluble Anions (ppm):	<u> </u>					
Cl	10.4				1.6	
CN	0.001					
F	6.6		1.42		0.7	1.3
HCO3					164	
NO3 as N	0.5		0.6		0.6	0.75
SO4	200	180		210	32.5	
Organics (ppm):	· · · · · · · · · · · · · · · · · · ·					
Phenols	0.4					
Oil & Grease	32.8					
Benzene	0.01					
Toluene	0.01					
TOC	125.07					
Others (ppm):	······					
Hardness (as CaCO3)		376	T	428	343	
pH	7.3				8.08	
TDS	558				400	

Table 2-2. Analytical Data for Groundwater Samples Taken from Selected Production Wells.

Note: Samples were taken by the Flora Vista Water Users Association and by L.A. Brewer & Associates, Inc.

Associates, Inc., who was, in turn, representing the FVWUA, conducted a trenching exercise in an effort to isolate the source of hydrocarbon contamination as detected in S-1. Thirteen trenches were excavated with a backhoe to a depth of 7 to 8 feet.

Groundwater was first noted to occur at a depth of between 5 and 6 feet below the ground surface. Groundwater samples were taken from each trench, and were sent to a laboratory to be analyzed for the presence of hydrocarbons. A partial summary of the analytical results is presented in Table 2-3.

At the conclusion of his study, Blair constructed a map showing the production units, the locations of all the trenches, S-1, OCD-5 (labeled as "monitor well M5" on his map), and the postulated boundary of the contaminated zone. Also shown on this map are the capture zones specific to S-1 as computed by OCD for pumping rates of 35 and 65 GPM. A copy of this report has been included in Appendix E.

2.3.3 OCD Monitoring Well Installation

The New Mexico Oil Conservation Division (OCD), on March 19 and 20, 1985, installed five groundwater monitoring wells in the alluvial aquifer underlying the Manana - Mary Wheeler #1-E well site. The locations of these monitoring wells can be found on Plate 1. The Oil Conservation Division originally assigned these wells the identifiers MW-1 through MW-5. To keep the origin of the wells easily identifiable, however, KWB&A has reidentified these wells as OCD-1 through OCD-5. Accordingly, the wells installed by KWB&A during the most recent site investigation (see Section 3.2) have been labeled EPNG-1, -2A, -2B, -3, and -4.

These five OCD wells were installed by excavating with a backhoe to a depth of approximately 8 feet below grade. According to OCD, wire-wound,

During the Blair Inves				rench I.D	•		
	A-1	C-4	D-5	D-6	E-5	E-6	F-1
	8/17/87	8/17/87	8/17/87	8/17/87	8/17/87	8/17/87	8/17/87
	16:40	16:55	11:56	16:40	14:35	15:05	15:50
Parameter	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
Aromatic Purgeables	3	ND	2	10			200
Halogenated Purgeables	ND	ND	ND	ND	ND	ND	ND
Aliphatic Hydrocarbons	ND						:
Base Neutrals	ND		6400		:		
Benzene					110	200	700
Toluene					30	2000	110
Ethylbenzene						20	150
p-xylene					170	685	950
m-xylene					470	2200	3070
o-xylene					200	785	920
Naphthalene			<5	<10	<25		
2-Methylnaphthalene	<5		<5	<10	<300		
1-Methylnaphthalene	<5		<5	<25	<300		
Acenapthalene			36	<25	<500		
Acenaphthene			14	<25	<25		
Fluorene			20	<10	<200		
Anthracene			10	<10	<25		
Phenanthrene/Anthracene							
Fluoranthene			<10				
Pyrene			<10				
Benzo(a)Anthracene/Chrysene							
Dibenzo(a,h)Anthracene							
Phenols							
Phthalate esters							
Others			<10				

Table 2-3. Analytical Data for Groundwater Samples Taken from Selected Backhoe Pits During the Blair Investigation.

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stainless-steel well screens, with a slot size of 0.07 inches, were installed in each well. As noted in a previous section, the slot size for these screens was too large for the material screened by the wells and, as a result, two of the monitoring wells (OCD-2 and -4) have been filled-in with silt and/or fine-grained sand. Nonetheless, groundwater samples were taken from each well, and returned to a laboratory for organics analysis.

On June 27, 1985, OCD returned to the site to develop the newlyinstalled monitoring wells with a gasoline-powered air compressor. Samples taken the following day indicated low or trace levels of hydrocarbons in three of the five wells. It is very probable that the air compressor introduced gasoline-combustion by-products into the monitoring wells, and these contaminants were present as dissolved constituents when sampling was done.

A second attempt at purging the wells prior to sampling, and at removing sediments that had accumulated in the wells, was also done with the aid of a gasoline-powered air compressor; this unit was not the same as the one used on June 27, however. Groundwater samples taken soon after purging with this compressor also showed low levels of contaminants. OCD subsequently tested the air compressor and found lubrication or combustion pollutants in the air line. Thus, OCD concluded that, once again, the samples taken during this period were not indicative of true groundwater quality, as the compressor introduced foreign contaminants into the wells.

After the monitoring wells had been installed, OCD continued to take groundwater samples from these, as well as S-1 and -5 and some of the production units, through May of 1986. These data are summarized in Table 2-4.

19:50 20:10 20:15 13:10 13 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1	Parameter als (ppm): ible Cations (ppm): ible Anions (ppm):	19:50	20:10	20:15	13:10			14:00		
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	la oluble Anions (ppm): 1 N					9.76				
	oluble Anions (ppm):					32.2				
						16				
	JaHCO3					278.7				
	(O3 (N)									
	04					C81	-			
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						653 0				

I aUIC 2-4 (CUILLY. MIALVILLA VALA IUL	ncal Data	for Ground	water Samp	les laken	Groundwater Samples Laken from S-1 by UCD.		10000	201001	101001	100.001	1001001	F 104 101
	3/20/85	6/28/85	4/22/86	4/22/86	4/22/86	4/23/86	4/23/86	4/24/86	4/24/86	4/25/86	4/28/86	5/21/86
Parameter			19:50	20:10	20:15	13:10	13:10	13:20	14:00	10:50		13:40
Organics (ppb):												
Oil & Grease											0	
TOC	171.03	797.36	126.93	640.75								
Benzene	Ð	Q	Q	Ð	£		1					-
Toluene	Ð	9	Ð	Ð			Q					
Ethylbenzene	Ê	Ð	9	1	Ð		Ð					
p-xylene	Ð	£	7	1	Ð		£					
m-xylene	Q	Ð	14	2	Ð		£					
o-xylene	Q	£	1	Ð	Ð		£					
Chloroform	£											
Other trihalomethanes	£	£										
Methane (dissolved)		1.3ppm					<u>.</u>					
Dichloromethane						7	1		15	-1		
Naphthalene												₹ 2
2-Methylnaphthalene												€5
Acenapthalene												ŝ
Fluorene												<u>ئ</u>
Phenanthrene/												\$
Anthracene												
Fluoranthene												\$
Pyrene		-										\$
Benzo(a)Anthracene/					-							\$
Chrysene												
Dibenzo(a,h)												<10
Anthracene												
Phenols												<50 ug/l
Phthalate esters						5 det.	2 det.					

2.3.4 OCD Pump Test

Beginning on April 21, 1986, OCD conducted a 72-hour duration pump test on the alluvial aquifer in which the water-supply and monitoring wells are completed. S-1 was used as the pumped well, and six observation wells, located from 30 to 200 feet from S-1 were employed for water level monitoring. At the outset, the test was to consist of 48 hours of pumping followed by 24 hours of recovery; in practice, however, only 21 hours of water level recovery were observed.

A centrifugal pump, equipped with a 25-foot-long intake hose, was used to rapidly withdraw water from S-1. Since this pump was rated at 350 GPM, it was necessary for OCD to install a valve for controlling the rate of discharge from the well. The initial discharge rate was set at 100 GPM.

The results of the test are summarized in Table 2-5. Significant findings of the study include the observation of an elongate cone-of-depression surrounding S-1. The observance of this phenomenon suggests that the alluvial aquifer is anisotropic in transmissivity, with the major axis of the transmissivity ellipse oriented in a northeast/southwest direction (i.e., N 45° E), which is roughly parallel to the river bank. Anisotropy is defined as having physical properties, such as transmissivity, that vary in different directions. Another explanation for the existence of a noncircular cone-of-depression is the influence of areas contributing recharge to the aquifer being pumped. In this case, the Animas River could be imparting an influence over the cone geometry.

As can be seen in Table 2-5, transmissivity is in the 14-15,000 GPD/FT range, and the storage coefficient, averaging 0.066, is indicative of unconfined to semiconfined aquifer conditions.

The following section contains a detailed discussion of KWB&A's site investigation of the Manana - Mary Wheeler #1-E well site.

			N	Aethod o	f Analysis			
					Adju	sted	Dimens	ionless
	The	eis			Tin	ne	Tir	ne
	(Modi	ified)	Jac	ob	Drawd	lown	Reco	very
Well	Т	S	Т	S	Т	S	Т	S
I.D.	(GPD/FT)	(-)	(GPD/FT)	(-)	(GPD/FT)	(-)	(GPD/FT)	(-)
S-1	8,014	N/A	7,196	N/A	9,429	N/A	15,529	N/A
					(Step 1)			
					5,500	N/A		
					(Step 2)			
					9,962	N/A		
					(Step 3)			
SX-1	14,614	0.0270	16,704	0.0190	13,200	0.0410	12,279	N/A
OCD-1	15,617	0.1000	N/A	N/A	NC	NC	ND	ND
OCD-3	14,855	0.0780	12,752	0.0700	NC	NC	ND	ND
OCD-4	15,227	0.0920	N/A	N/A	NC	NC	ND	ND
OCD-5	14,677	0.0970	N/A	N/A	NC	NC	ND	ND

Table 2-5. Summary of Results of Pump Test Conducted by OCD - April 21-25, 1986.

Notes:

1. N/A - Not Applicable, NC - Not Calculated, ND - No Data

2. Storage coefficient cannot be calculated for the pumped well.

3. Low T values for S-1 during pumping are a result of well entrance losses.

4. Drawdown in OCD-2 was too small to permit T,S evaluation.

Starting on June 12, 1989, KWB&A initiated a site investigation at the Manana - Mary Wheeler #1-E well site, beginning with an orientation of the site, followed by groundwater level measurement of the existing wells, and excavation of a series of trenches aimed at corroborating Blair's findings of 1987 and confirming the continued presence of subsurface hydrocarbon contamination. Five new groundwater monitoring wells were installed, one in an upgradient position, one two-well cluster (downgradient), and two additional downgradient wells located inside the postulated boundary of the plume. Production wells S-1 and S-5 were stressed by pumping approximately 8,400 and 12,600 gallons from each in preparation for taking fresh formation-water samples. The final task of the investigation was to make excavations in what was believed to be the area where the reserve pit was located in an effort to locate this buried feature. Each of these tasks is discussed in turn in the sections that follow.

3.1 EXCAVATIONS

A total of seven trenches were dug with the aid of a backhoe at the site. Each trench was advanced to a depth necessary to expose the water table and any hydrocarbon staining. The location of each trench was guided by Blair's site map (Section 2.3.2), as it was undesirable to excavate an old trench where disturbance of the subsurface had occurred. Each pit location is plotted on Plate 1.

Once a trench had been excavated, soil samples were taken immediately to minimize the escape of volatile organic compounds from the pit. Then, the approximate dimensions of each trench were recorded, and significant observations of each were made. When lighting conditions permitted the

observance of significant contrast between the clean and contaminated soil, photographs were taken of the interior of the pit (Appendix F).

In every case, it was impossible to determine the vertical extent of the hydrocarbon staining, as the co-mingling of groundwater with the hydrocarbon matter confounded any attempts at measuring this property. However, as hydrocarbon compounds are usually lighter than water, it is expected that, due to seasonal variations in water table altitude, most of the hydrocarbons bracket the average water table elevation. That is, there is probably a certain mass of hydrocarbon matter both above and below the water table. If there are any hydrocarbons present in a free-phase condition, it would be expected that a layer of oil floating on the water table could be visually discerned.

The following sections provide a discussion of each trench, including dimensions and significant observations. Laboratory results for the soil samples collected from each excavation can be found in Appendix G. A summary of the laboratory results is presented in Section 3.5.2.

3.1.1 <u>Trench T-1</u>

This pit, excavated on June 12, 1989 to a length of 125 feet, found oil occurring at a depth of approximately 4 feet below the ground surface, and groundwater at 5 feet. The material removed from the excavation can be characterized as a very poorly-sorted, cobbley coarse sand. Soil removed from the pit was stained a blue-black color, and there was a distinct petroleum odor emanating from the excavation. An examination of the water table showed an absence of a "rainbow sheen." The presence of hydrocarbon matter was indicated, however, by a film of tiny spherical oil droplets on the water table.

The excavation was terminated on the west for fear of damaging an adjacent alfalfa crop on that side of the gas well location. Oil was found

from the westernmost limit of the excavation to within 15 feet of the easternmost end of the trench, yielding a minimum plume width of 110 feet.

Three soil samples were taken from T-1 at the level of the hydrocarbon staining, one from the western end of the excavation, one from the center, and one from the eastern portion of the pit (Plate 1).

3.1.2 <u>Trench T-2</u>

T-2, also dug on June 12, 1989, was approximately 80 feet in length. Oil and groundwater were found to be coincident in this excavation, and were both noted to occur at about 4 feet below grade. Due to the constant disturbance of the water table by the backhoe bucket, however, it is possible that the water table was actually 6 to 8 inches below the first occurrence of hydrocarbon staining. It was obvious that the lateral extent of the oil staining was less in T-2 than in T-1, suggesting that the plume had decreased in width between these trenches. It is estimated that the plume is 70 feet wide in T-2.

As in T-1, three soil samples, one from the western end of the pit, one from the center, and one from the eastern end of the trench, were collected.

3.1.3 <u>Trench T-3</u>

Located about 90 feet northeast of S-1, trench T-3 was excavated on June 13, 1989, and was approximately 70 feet long. The western end of T-3 saw an absence of oil, while the central portion of this pit found heavy hydrocarbon staining at about 4 feet; groundwater was first noted about 6 inches below this level. In the eastern one-fourth of T-3, there was a pronounced lack of oil, and the stratigraphy had changed to mostly sand with a lower proportion of cobbles. The plume width in T-3 is estimated at 40 feet.

Soil samples were taken from the western, central, and eastern sections of the excavation.

3.1.4 <u>Trench T-4</u>

Located about 15 feet southwest of S-1 and 15 feet northeast of SX-1, trench T-4 was excavated to a length of 70 feet. Groundwater in this pit occurred at the shallow depth of 3 feet below grade. There was no indication of hydrocarbon staining anywhere in the entire excavation. No hydrocarbon odors were present in the soil or groundwater, and no sheens could be discerned on the water surface.

The texture of the materials removed from T-4 were finer-grained than those taken from the previous three pits, and were characterized as coarse sand with a small percentage of gravel. There was an abundance of clayey sand and sandy clay in the upper section of the trench walls, representing overbank deposits laid down by the Animas River during high-stage periods. An abundance of black organic matter was noted in the sediments, and iron staining was apparent from the surface down to 6 to 8 inches above the water table.

Although no visual evidence supporting the presence of hydrocarbons could be noted, soil samples were taken slightly above the water table from the western, central, and eastern portions of the excavation.

3.1.5 <u>Trench T-5</u>

This trench, dug slightly north of T-1, south of the produced water tank, and in a direction parallel to the prevailing groundwater flow direction, was aimed at confirming the easternmost limit of the plume in this region of the site. Excavated to a length of only 17 feet, this pit found hydrocarbon staining at a depth of 3 feet below the ground surface. As with the previous excavations, groundwater was first detected a small distance below the first sighting of oil. A hydrocarbon odor was noted

emanating from the trench, but its intensity was rather low. No other significant observations were noted.

One soil sample was collected from T-5 from the northernmost limit of the pit.

3.1.6 <u>Trench T-6</u>

The location for this trench was selected by a representative of OCD. Groundwater in this pit was first noted at a depth of 5 feet. In the eastern end of the excavation, the stratigraphy was characterized as a very plastic, gray to dark-brown clay, with black staining that appeared to be reduced organic matter; this material had no odor. The western limit of the trench exposed a sandy top soil underlain by a cobbley sand. There was no visual evidence supporting the presence of hydrocarbons anywhere in this 50-foot-long trench.

One sample was taken at each end of the pit.

3.1.7 <u>Trench T-7</u>

T-7, located approximately 240 feet southwest of S-1, was dug to a length of only 10 feet. The geologic materials encountered while advancing this trench were characterized as a brown, very plastic, sandy clay, with a black-stained clay coincident with the water table at about 3 feet below grade. Although there were no indications of oil present in the subsurface in T-7, one soil sample was collected from the eastern end of the pit.

3.1.8 <u>Dehydrator Pit</u>

Two excavations were made in the area believed to be the old unlined pit located directly south of the dehydrator (see Section 2.2). These pits were aimed at defining the limits of this buried feature, and in determining the strength of the source of the hydrocarbons found in the subsurface throughout the extent of the site.

The first excavation, oriented roughly northeast/southwest, was 46 feet long, and found visible evidence of hydrocarbon contamination in the middle 16-feet of the pit (Plate 1). Heavy blue-black hydrocarbon staining was evident beginning at about 12 inches below grade in this area. Groundwater was first seen at about 5.4 feet.

The second excavation, oriented transverse to the first and positioned so as to intersect the first trench, was dug to a length of 29 feet, and found evidence of hydrocarbons in the subsurface in the middle 20 feet of this trench.

A total of four samples were taken; each sample was taken at the limit of visible oil staining. Thus, one sample each was collected from the northeastern, northwestern, southeastern, and southwestern edges of the hydrocarbon plume as exposed by the trenches.

3.2 MONITORING WELLS

In an effort to evaluate the extent of groundwater contamination as manifested by the presence of dissolved hydrocarbon constituents, five monitoring wells were installed by KWB&A on June 14, 1989. Each boring was drilled by Mo-Te Drilling Company of Farmington, New Mexico, and was logged by KWB&A. The drilling equipment used to advance each boring consisted of a Mayhew 1500 rotary-wash drilling rig. Sampling of the geologic medium was not done for this investigation due primarily to the presence of large river cobbles; this condition precluded the use of conventional sampling equipment. A record of the materials encountered by the drill bit was made, however, by an examination of the cuttings that were removed from the borehole.

In order to penetrate the gravel and cobbles, which were very abundant at the site, and to prevent the hole from caving when the drill string was

out, it was necessary to use a bentonite mud in the drilling process. Once the appropriate depth had been reached, the mud was circulated out of the borehole by flushing fresh water down through the drill pipe and up along the annular space. Once a clean borehole was established, the well casing was set.

Materials used to construct each well consisted of 2-inch I.D., schedule 40, flush-threaded PVC casing and well screen. Each screen was 5feet long, was slotted over a distance of 4-feet, and had 0.010-inch-wide One of the goals of this portion of the investigation was to slots. install a well screen in each well so the middle portion of the screen straddled a level corresponding to the mean water table elevation. By accomplishing this, the water table could be clearly observed in each well with as much as \pm 2 feet of change in the water table position; this is important for situations in which free-phase liquids are in contact with the water table. The material used to form the sand pack was a #10 silica sand, indicating that 98 to 100% of the grains in a sample of this material will pass through the U.S. Standard #10 sieve (2.0 mm). A bentonite seal was effected by using 0.25-inch, dehydrated bentonite pellets. The remainder of the annular space was occupied by a Type I & II Portland cement grout. To prevent unauthorized access to each well, a steel, lockable well cover was placed over the PVC casing and embedded in the concrete collar surrounding the casing; each of these units was equipped with a padlock, and each padlock could be opened with the same key.

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The location for the upgradient well, identified as EPNG-1, was the first to be selected (Plate 1), since it is desirable, when drilling in an area suspected of having subsurface contamination, to begin in the least contaminated area to minimize cross-contamination of wells. Sand and cobbles were encountered from the surface down to the total depth (TD) of
10 feet for EPNG-1. There were no indications that a zone of hydrocarbon contamination had been penetrated by the drill stem.

A two-well cluster was chosen for installation in a position slightly downgradient of the gas wellhead (Plate 1). This piezometer nest was designed to determine the presence of a vertical hydraulic gradient beneath the site, if any, and to ascertain the existence of dissolved contaminants at a depth slightly below the water table. The shallow well bears the identification EPNG-2A, and the deeper well is designated EPNG-2B. Drilled to a TD of 10 feet, EPNG-2A found black-stained sediments at a depth of approximately 5 feet. Since EPNG-2B was only a few feet away from EPNG-2A, the same black-stained materials were noted in the cuttings removed from this borehole. EPNG-2B was designed to be the deeper well, and was drilled to a TD of 17 feet. The geologic materials met by the drill string in both borings were cobbley to gravelly sand.

EPNG-3, drilled slightly south of T-2 (Plate 1), saw oily-stained soil at a depth of 5 to 6 feet, and was drilled to a TD of 8 feet. Materials similar to those drilled through for installation of EPNG-1, -2A, and -2B were noted in EPNG-3.

The last well installed by KWB&A, EPNG-4, was located a few feet to the southeast of OCD-5. Oily-stained sediments were first penetrated in this boring at a depth of approximately 4 feet below grade. EPNG-4 was drilled to a TD of 8 feet.

Table 3-1 summarizes the construction details for each groundwater monitoring well. Geologic logs and well construction diagrams are available in Appendix I for each monitoring well.



Table 3-1. Summary of Groundwater Monitoring Well Construction Details.

					Feet, M	SL/Feet				
	EPN	[G-1	EPN	G-2A	EPN	G-2B	EPN	IG-3	EPN	IG-4
Well Component	Elev.	Depth	Elev.	Depth	Elev.	Depth	Elev.	Depth	Elev.	Depth
Steel Cover	5,486.97	N/A	5,486.48	N/A	5,485.67	N/A	5,484.87	N/A	5,483.83	N/A
Well Casing	5,487.03	N/A	5,486.54	N/A	5,485.68	N/A	5,484.90	N/A	5,483.87	N/A
Pad	5,483.88	N/A	5,483.04	N/A	5,482.89	N/A	5,481.49	N/A	5,480.50	N/A
Grade	5,483.81	0.0	5,482.94	0.0	5,482.92	0.0	5,481.85	0.0	5,480.45	0.0
Top of Bentonite	5,481.81	2.0	5,480.44	2.5	5,474.92	8.0	5,481.85	1.5	5,478.95	1.5
Top of Sand	5,479.81	4.0	5,478.44	4.5	5,471.92	11.0	5,480.35	2.5	5,477.95	2.5
Top of Screen	5,479.31	4.5	5,477.94	5.0	5,470.92	12.0	5,479.35	3.0	5,477.45	3.0
Bottom of Screen	5,475.31	8.5	5,473.94	9.0	5,466.92	16.0	5,478.85	7.0	5,473.45	7.0
TD	5,473.81	10.0	5,472.94	10.0	5,462.92	20.0	5,474.85	8.0	5,471.95	8.5

3.3 RESERVE PIT

Three trenches were excavated with a backhoe in the area believed to be the location of the old reserve pit. This area was chosen based on discussions with OCD and EPNG personnel. The first trench, identified as RP-1, was dug to a depth of 4 feet and a length of 12 feet, and found an oily layer of soil from 2 to 3 feet, and a sandy bentonitic layer from 3 to 4 feet (Plate 1). One soil sample was taken from the oily horizon (RP-1A) and one from the bentonite layer (RP-1B).

The second trench, labeled as RP-2, was 10 feet long, and was excavated to a depth of 3.5 feet. A piece of scrap pipe was unearthed at about 3 feet below grade, and a massive gray clay with black staining along bedding planes was noted from 3.3 to 3.5 feet. No hydrocarbon odors were detected in the soil sample (RP-2) taken from the gray clay horizon, or in any other places in the excavation.

Excavated approximately 5 feet southeast of the terminus of RP-2, the third and final trench, RP-3, found conditions very similar to those noted in RP-2. A piece of concrete debris was dug up from a level of about 3.5 feet, which corresponded to the maximum excavated depth for this pit. Due to the visible soil conditions similar to those observed in RP-2, no soil samples were taken from RP-3.

3.4 SAMPLING AND ANALYSIS

As briefly discussed in previous sections, soil and groundwater samples were collected from the newly-excavated trenches and from the newly-installed monitoring wells. A total of 24 soil samples and 11 groundwater samples were collected from the Manana - Mary Wheeler #1-E well site. Each sample was subjected to a chemical analysis for identical suites of parameters. In general, three analyses were run on each sample:

indicator parameters, organics, and inorganics. Table 3-2 lists the individual inorganic and metals parameters measured on each sample, and Table 3-3 list the organic compounds.

3.4.1 Soil Sampling

The general procedure followed for soil sampling was to acquire a backhoe bucketful of soil from the level at which a sample was desired. Samples of soil were collected from the bucket with a clean, decontaminated, stainless-steel scoop, and placed into a similarly clean stainless-steel bowl. The sampler was careful to screen the sample of large rocks and other debris prior to filling the sample containers.

Since volatile organics were to be measured, a 40-ml clear glass vial with a Teflon septum was filled immediately after the backhoe operator removed the bucket from the excavation. Next, a 250-ml amber glass jar was filled, and then a sealable plastic bag was filled with soil. Each container was labeled with a sample I.D., date, time, and chemical analysis to be performed on the sample, and placed on ice in an ice chest. A note was made of the sampling location in the field logbook.

The contractor's backhoe bucket was inspected prior to the first excavation and was found to be free of soil from any previous site work. Prior to each excavation, the bucket was inspected by KWB&A for loose soil or oily debris that could have resulted in cross-contamination of the trenches. Additionally, it was believed that the action of removing the overburden material and back-filling of the trenches sufficiently cleaned the bucket to forego steam-cleaning between excavations. At no time was the backhoe observed to be leaking any kind of oil or hydraulic fluids.

3.4.2 Groundwater Sampling

Groundwater sampling was limited to the newly-installed monitoring wells, the OCD-series wells, and selected water production wells. Sampling



Table 3-2.	Inorganic Anal	vtical Parameters Mea	isured on Soil and	Groundwater Samples.
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Indicator	Parameters	Soluble	Cations	Soluble	Anions	Me	tals
Soil	Water	Soil	Water	Soil	Water	Soil	Water
EC	EC	Calcium	Calcium	Chloride	Chloride	Barium	Barium
Oil & Grease	Oil & Grease	Magnesium	Magnesium	CO3	CO3	Cadmium	Cadmium
pН	pН	Potassium	Potassium	HCO3	HCO3	Chromium	Chromium
	SAR	Sodium	Sodium	Sulfate	Sulfate	Selenium	Selenium
	TDS (180c)				Sulfide		
	TDS (Calc.)				Sulfite		
	Total Alk.						

Table 3-3. Organic Analytical Parameters Measured on Soil and Groundwater Samples.
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	alytical Farameters Weastre	Polynuclear		
Aromatic	Halogenated	Aromatic	Chlorinated	
Volatile Organics	Volatile Organics	Hydrocarbons	Hydrocarbons	Glycols
Benzene	Chloromethane	Naphthalene	1,3-Dichlorobenzene	Ethylene Glycol
Toluene	Bromomethane	Acenaphthalene	1,4-Dichlorobenzene	Diethylene Gly∞l
Ethylbenzene	Dichlorodifluoromethane	Acenaphthene	1,2-Dichlorobenzene	
Chlorobenzene	Vinyl Chloride	Fluorene	Hexachlorobutadiene	
p,m-Xylene	Chloroethane	Phenanthrene	1,2,4-Trichlorobenzene	
o-Xylene	Methylene Chloride	Anthracene	Hexachlorocyclopentadiene	
1,4 Dichlorobenzene	1,1-Dichloroethene	Fluoranthene	2-Chloronapthalene	
1,3 Dichlorobenzene	Trichlorofluoromethane	Pyrene	Hexachlorobenzene	
1,2 Dichlorobenzene	1,1-Dichloroethane	Benzo(a)Anthracene		
	trans-1,2-Dichloroethene	Chrysene		
	Chloroform	Benzo(b)fluoranthene		
	1,2-Dichloroethane	Benzo(k)fluoranthene		
	1,1,1-Trichloroethane	Benzo(a)pyrene		
	Carbon Tetrachloride	Dibenzo(a,h)anthracene		
	Bromodichloromethane	Indeno(1,2,3-cd)pyrene		
	1,2-Dichloropropane	Benzo(ghi)perylene		
	cis-1,3-Dichloropropene	Benzo(j)fluoranthene		
	trans-1,3-Dichloropropene	Dibenz(a,h)acridine		
	Trichloroethene (TCE)	Dibenz(a,j)acridine		
	Dibromochloromethane	Dibenz(a,e)pyrene		
	1,1,2-Trichloroethane	Dibenz(a,h)pyrene		
	2-Chloroethylvinyl ether	Dibenz(a,i)pyrene		
	Bromoform	3-Methylcholanthrene		
	1,1,2,2-Tetrachloroethane			
	Tetrachloroethene (PCE)			
	Chlorobenzene			
	1,3-Dichlorobenzene			
	1,2-Dichlorobenzene			
	1,4-Dichlorobenzene			

of groundwater found in the trenches was not performed since the backhoe bucket generally induced significant disturbance of the formation material. In general, it is asserted that any groundwater sample taken from the trenches would not have been representative of formation water quality.

Groundwater sampling generally involved drawing a significant volume of water from each well in an effort to obtain a fresh sample representative of formation conditions. The newly-installed groundwater monitoring wells, EPNG-1, -2A, -2B, -3, and -4, were first "developed" by submerging a 1-inch I.D. PVC air compressor discharge line below the water level in each well and applying air pressure to the line. This action served to violently remove water and bentonite drilling mud remnants from the well, thereby purging a large volume of water in a short period of time. The air compressor used for this exercise was equipped with a dryelement filter that prevented any oil, water, or combustion by-products from entering the discharge stream.

As mentioned previously, OCD-2 and -4 had become filled with silt and/or sand since their installation. Each of these wells was developed using the above-mentioned procedure in an effort to remove the accumulated sediments.

The production wells S-1 ands S-5 were scheduled to be sampled during the site investigation. Based on an inspection of these wells at the outset of the investigation, it was obvious that they had not been pumped for quite some time. Thus, a centrifugal pump was to be used to rapidly remove a large volume of groundwater from these wells in preparation for acquiring samples.

The pump used to develop S-1 and S-5 was rated at 85 GPM; a well-site calibration showed, however, that, at the current level of lift at approximately 20 feet, only 70 GPM could be realized with the unit. This

rate of flow was deemed adequate to properly remove the necessary volume of water in a short amount of time.

S-5 began pumping at about 10:45 am on June 14, 1989. The initial slug of water pumped from the well was colored black, but there was no hydrocarbon odor detected in the discharge. The dark color of the water can probably be attributed to decaying organic matter inside the well casing, since this well did not have any type of cover or seal. The water discharging from the well turned to a clear color within 2 minutes, however.

The pump was left to run unattended for a period of about 2 hours. Upon returning to S-5, it was noted that the pump had stopped running, apparently due to an exhaustion of its fuel supply. It was estimated that in excess of 5,000 gallons of water had been purged from the well.

Pumping of S-5 was resumed on the afternoon of June 15, 1989, with the same centrifugal pump. This time, S-5 was pumped for a period of 45 minutes at a rate of about 70 GPM, yielding a volume of water removed from the well of 3,150 gallons. Once the pump was stopped, an electronic depth-to-water meter was used to measure the rate of recovery of the water level inside the well (Figure 3-1).

Following the recovery test of S-5, the pump was set-up on S-1, and started. The first slug of water pumped from the well was tainted with an orange or rusty color; there were no odors noted in the discharge, however. After about 5 minutes of continuous pumping, the water was flowing clear from the well. As with S-5, after 45 minutes of pumping, the rate of water level recovery was monitored in S-1 (Figure 3-2).

Approximately 25 gallons of groundwater were removed from EPNG-1 with a bailer prior to acquisition of a sample. It was noted that the water collected for a sample from this well was turbid.



Figure 3-1. Graph of Water Level Recovery Versus Time for Water Production Well S-5.



Graph of Water Level Recovery Versus Time for Water Production Well S-1. Figure 3-2.

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RECOVERY TIME (SEC.)

Forty gallons were purged from EPNG-2A with the aid of an Isco bladder pump prior to collecting a sample. The water collected was initially slightly muddy and turbid, but changed to slightly gray with a very faint hydrocarbon odor. A duplicate sample, identified as KWBA-1, was taken from this well.

EPNG-2B, the deeper well in the EPNG-2 cluster, was pumped for a period of time, with the bladder pump, sufficient to remove 45 gallons prior to acquisition of a groundwater sample. The water was initially muddy, but cleared after about 15 gallons had been purged. No odors or oil were noted in the samples collected.

About 80 gallons were drawn from EPNG-3 before a sample of groundwater was collected. The water purged from the well was relatively clear with a light gray tint, and a slight hydrocarbon odor.

The last of the newly-installed wells, EPNG-4, was purged of 70 gallons prior to taking a sample. The first 30 or 40 gallons removed were black and had a slight oil sheen; the remaining 30 or 40 gallons, however, were clear and free of any odors.

Approximately 15 gallons of groundwater were purged from OCD-1 with a clean, decontaminated PVC bailer. The water removed from the well was very rusty, and there was a great deal of sand and gravel, as well as live ants, in the well. The water collected for a sample was turbid and devoid of any hydrocarbon odors, but there was a light film noted on the surface of the water.

Roots were found to have grown into the well casing of OCD-2, resulting in some difficulty in getting a bailer down into the well. The water was still turbid after purging 20 gallons.

Since this well was clearly located outside the boundary of the plume, it was decided to forego sampling of OCD-3.

An attempt to bail OCD-4 found that the well casing had somehow become bent, precluding the introduction of either the Isco pump or a bailer. As a result, this well was not sampled.

S-1 was pumped for an additional hour on June 16, 1989, prior to collection of a groundwater sample. The sample was taken with a clean, decontaminated PVC bailer. However, as the bailer was raised from the well, it encountered a protrusion on the inside of the steel well casing below the water line, and rusty flakes of steel fell into the well.

S-5 was also pumped for an additional hour on June 16, 1989, in preparation for collecting a fresh formation-water sample. The water collected with a bailer from this well had a distinct septic odor.

A field blank, labeled KWBA-2, consisted of a sample of deionized water that was collected at the end of the groundwater sampling exercise.

It is generally recognized that fresh formation water has been sampled when pH, EC, and temperature have reached constant values for repeated episodes of post-purging groundwater sampling. Thus, in keeping with this concept, field measurements of pH, EC, and temperature were made prior to collection of a sample to insure that these parameters had stabilized.

The water samples were placed into two glass 1-liter containers, one Mason jar, two 40-ml glass vials with Teflon septa, and a 250-ml glass container. All water samples scheduled for the metals analysis were filtered through a 0.45-micron membrane and preserved with nitric acid prior to being placed into the appropriate jars. Each container was labeled with a sample I.D., date, time, and type of analysis to be performed, and placed on ice in an ice chest.

Chain-of-custody procedures were followed for all samples, both soil and water.

3.5 RESULTS AND DISCUSSION

3.5.1 Groundwater

Plate 2 depicts the water table configuration in the alluvial aquifer upon which the Manana - Mary Wheeler #1-E well site rests. The prevailing groundwater flow direction is in a southerly direction and, assuming an effective porosity of 40%, moves at an average linear rate of 2 to 3 feet

per day.

The predominant constituents found in groundwater samples taken from the OCD-series wells, the newly-installed EPNG-series wells, and S-1 and S-5, were the aromatic volatile organics, with the principal species of this group being the BTEX, or benzene/toluene/ethylbenzene/xylene group (Table 3-4). The number of BTEX values was insufficient to warrant the construction of any type of contour, or isopleth, map. Instead, a map showing the locations of groundwater samples and the corresponding numerical analytical values is available in Plate 3.

As illustrated by Plate 3, the highest BTEX levels were found in wells screened inside the limits of visible hydrocarbon staining, with the highest concentrations occurring in EPNG-2A and EPNG-3. The former well is located approximately 50 feet south of the estimated location of the dehydrator pit, while the latter is located less than 30 feet west/southwest of the estimated location of the reserve pit.

A sample collected from the upgradient monitoring well, EPNG-1, was found to have a concentration of 0.34 ug/l of p,m-xylene. Since the nearest production unit to this well is the oil storage tank (Plate 1), which is located about 30 feet south of EPNG-1, it is not clear from which source this contaminant derives.

An analysis of samples taken from EPNG-1, S-1, and OCD-1 indicated the presence of methylene chloride, a commonly-used laboratory solvent, at

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Analytical	
Table 3-4.	

	NM WQCC								007	0			
	Standard					5	Concentration (ug/l	tion (ug/l)	100	5			
Constituent	(I/gn)	EPNG-1	EPNG-1 EPNG-2A	EPNG-2B EPNG-3 EPNG-4	EPNG-3	EPNG-4	OCD-1	OCD-2	OCD-3	OCD-4	OCD-5	S-1	S-5
Aromatic Volatile Organics:	nics: /	sh .											
Benzene	10	Q	8.1	1.6	0.4	0.95	Q	Ð	NS	NS	NS	Ð	0.26
Ethvlbenzene	75	Ð	37.4	1.2	4.3	Q	Ð	QZ	NS	NS	NS	Ð	Ð
Methvlene Chloride	100	2.1	Ŕ	QZ	ą	Q	1.3	Q	NS	NS	NS	1.6	Ð
Toluene	75	Q	Q	Q	0.33	Ð	Q	Ð	SN	SN	SS	£	0.32
Xylene (total)	62		192.4	12.1	13.54	ND	ND	QN	NS	NS	NS	Ð	Ð
Polynuclear Aromatic Hydrocarbons:	Iydrocarbon												
Benzo(b)fluoranthene	see note 3	QN	QN	QN	QN	0.002	QN	QN	NS	NS	SS	Ð	Ð
Indeno(1,2,3-cd)pyrene	:	QN	ND	DN	QN	0.006	Ð	Q	NS	SN	NS	g	£
Notes:						4							
						-							
1. WOCC standard, Section 3-103, as amended through Dev	tion 3-103, as	amendec	l through D	December 24, 1987	. 1987								

1. WQCC stand

WCCC standard, section 3-109, as antended unough sections.
 ND - not detected, NS - well not sampled
 PAHs: total napthalene plus monomethylnapthalenes = 30 ug/l

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levels slightly above the detection limit of 1.0 ug/l. The presence of this compound can probably be attributed to its use in decontaminating the sample containers by the analytical laboratory.

Benzene and toluene were both detected at levels slightly above the analytical detection limit of 0.20 ug/l in S-5. Since there were no recorded hits of volatiles in OCD-2, which lies between the production units and S-5, and since water samples collected from S-1 and OCD-1, also lying between the production units and S-5, did not show the presence of either benzene or toluene, the mechanism responsible for the introduction of these contaminants near S-5 is not clear.

The compounds benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene were the only polynuclear aromatic (PNA) compounds detected in water samples; these constituents were detected at levels slightly above the detection limit in EPNG-4, which is located on the approximate centerline and in the downgradient extremity of the visible plume (Plate 4).

There were no recorded hits of either ethylene or diethylene glycol, or any of the chlorinated organics.

3.5.2 <u>Soil</u>

The BTEX, or aromatic volatile organics in general, for the soil samples taken from the trenches, were found to be of the same order of magnitude as those measured on the water samples (Table 3-5; Plate 5). The largest values were recorded for samples taken from the vicinity of the dehydrator pit, and from the area around what is believed to be the location of the reserve pit.

A sample collected from an area near EPNG-1 (Plate 5) thought to be devoid of soil contamination (i.e., a "background" area), indicated the presence of 1,2-dichloropropane at a level of 0.61 ug/g; the detection limit for this compound is 0.60 ug/g, however. An analysis of a duplicate

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Results for Soil Samples.	
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	NM WQCC Standard						Concentra	Concentration (ug/g)	Ludd (h			
Constituent	(a/g)	BG-1	T-1E	T-1C	T-1W	T-2E	T-2C	T-2W	T-3E	T-3C	T-3W	T-4E	T-4C
Aromatic Volatile Organics:	nics:												
Benzene	see note 1	QN	QN	QN	QN	0.22	Q	ą	Ð	Q	Q2	Ð	Ð
Chlororbenzene	:	Ð	QN	Ð	Ð	Ð	Q	g	Ð	0.19	Ð	Ð	Ð
Ethylbenzene	:	ą	ą	g	Ð	QN	Q	Ð	Q	Q	Ð	QZ	Ð
Methylene Chloride	:	Q	Q	Ð	ą	QZ	Q	ą	Ð	Ð	Ð	Ð	Ð
Toluene	:	Q	a	0.16	ą	0.33	0.26	Ð	Ð	Ð	Ð	QN	g
Vinyl Chloride	2	g	QN	ą	Ð	Ð	Q	Ð	Ð	Ð	Ð	Ð	Ð
Xylene (total)	2	ND	0.98	DN	0.73	QN	0.94	QN	QN	QN	QN	Ð	Q
Polynuclear Aromatic Hydrocarbons:	Iydrocarbons												
Acenapthene	see note 1	QN	QN	QN	Q	3.584	Q	Ð	Ð	Q	Q	Ð	Ð
Chrysene	:	Ð	Q	Ð	Ð	Q	g	Ð	Ð	g	Ð	£	Ð
Fluoranthene	:	Q	Ð	Ð	0.165	QZ	g	g	Ð	Ð	ĝ	Ð	Ð
Napthalene	=	QN	ND	QN	QN	3.901	QN	QN	Q	QN	Ð	Ð	Ð
Notes:													

P. WQCC standard not available
 2. ND - not detected

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NM WQCC	NM WOCC								\langle	27			
	Standard					•	Concentration (ug/g	tion (ug/g)		1			
Constituent	(a/gn)	T-4W	T-5	T-6E	T-6W	T-7	P-N	P-S	P-E	M-4	RP-1A	RP-1B	RP-2
Aromatic Volatile Organics:	nics:												
Benzene	see note 1	an	QN	QN	QN	Q	QN	az	QN	2.6	QN	QN	Ð
Chlorobenzene	:	Ð	QZ	Q	QN	Ð	QN	0.37	QN	Ð	Q	Ð	Ð
Ethylbenzene	E	QN	QN	Ð	Ð	ą	QN	Q	Ð	QZ	Ð	Q	Ð
Methylene Chloride	:	Ð	Ð	Ð	ą	g	Ð	ą	Q	QN	Q	Ð	Ð
Toluene	=	g	Ð	Ð	Ð	QN	1.2	Ð	Ð	34.3	Ð	ĝ	Q
Vinyl Chloride	ŧ	ą	ą	Ð	Q	Q	Ð	Ð	Ð	QZ	Ð	4.3	£
Xylene (total)	Ŧ	QN	QN	QN	ND	QN	17.8	0.76	2.1	177.2	QN	Ð	QN
Polynuclear Aromatic Hydrocarbons:	[ydrocarbons												
Acenapthene	see note 1	QN	QN	an	QN	Q	QN	Ð	QN	Q	an	Ð	Ð
Chrysene	F	Ð	ą	Ð	Ð	Ð	0.118	Ð	Ð	Ð	g	g	Ð
Fluoranthene	F	Ð	Ð	Ð	Ð	R	0.178	Ð	Ð	g	Ð	Ð	Ð
Napthalene	F	g	QN	Ð	Ð	Ð	QN	QN	ND	ND	ND	QN	ND
Notes:													

WQCC standard not available
 ND - not detected

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sample did not indicate the presence of this halogenated volatile organic compound. As with the water sample results, there were insufficient data points to justify the development of a contour map for the volatile organic compounds.

There were no volatile organics detected in samples taken downgradient of trench T-3.

Plate 6 depicts the spatial distribution of oil and grease in samples taken during the trenching exercise. As illustrated by this map, there are three principal areas of concern on-site: the area of the dehydrator pit, the area downgradient of the speculated-location of the reserve pit, and an area downgradient of the production units, centered on the southeastern limit of trench T-6.

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It is possible that the latter zone developed by the downgradient migration of a "slug" of oil and grease that originated near the production units. There are insufficient data to definitively establish the location of this source, however. The general distribution of oil and grease in this area suggests that, at some point in time, a large volume of oily material was released to the subsurface for a finite interval of time. At the end of this time period, the strength (or concentration) of the oil and grease-bearing matter was dramatically reduced, thereby resulting in the present-day distribution of oil and grease. In the absence of information regarding the onset and duration of the release of the oily material, it is impossible to calculate the rate of migration of this mass.

There were three recorded hits of PNA compounds in the soil samples (Plate 7). The highest concentrations noted were for a soil sample taken from trench T-2 in its southeasternmost-extremity (T-2E), where the compounds detected were naphthalene (3.901 mg/kg) and acenaphthene (3.584 mg/kg). This sample was located on a line between the sampling points for

the area of the reserve pit. None of the reserve pit samples indicated the presence of PNAs, however. Additionally, T-2E was taken from an area noted to be free of subsurface hydrocarbon staining.

The other two samples indicating the presence of PNAs were located near the dehydrator pit in samples P-N (Pit-North) and T-1W (western end of trench 1). The compounds detected were fluoranthene (0.165 mg/kg) in T-1W, and fluoranthene (0.178 mg/kg) and chrysene (0.118 mg/kg) in P-N.

There were no recorded hits of either ethylene or diethylene glycol, or any of the chlorinated organics.

The principal heavy metal of interest in this investigation was chromium, as this element forms a significant component of the drilling mud additive chromium-lignosulfonate (Dames and Moore, 1982). Although no information was available regarding the composition of the drilling mud used to drill the Manana - Mary Wheeler #1-E gas well, the analytical data for the soil samples taken in and near the drilling mud reserve pit (i.e., the RP-series samples) suggest that this additive was indeed used on this occasion.

It is worth noting that the range of chromium concentration in soil is 1-1,000 ppm, with the average being 100 ppm (Brown et al., 1983). In the instant case, however, it appears that the native chromium concentration is significantly lower than 100 ppm, at around 5 to 10 ppm. The heaviest concentrations of chromium found at the Manana - Mary Wheeler #1-E well site were in samples RP-1A, RP-1B, and RP-2, which were collected from an area believed to be the location of the drilling mud reserve pit.

A metal of less-significant interest than chromium, barium, occurs naturally in soils at a level of between 100 and 3,000 ppm, and is a component of the drilling mud additive barite (Brown et al., 1983). Barium

concentrations measured in soil samples taken from the trenches fell well within the range of naturally-occurring barium, at approximately 400 ppm. The RP-series samples did not suggest the presence of barium at elevated levels. In fact, RP-1A indicated the lowest recorded barium concentration of 28 ppm.

Perhaps a better indicator of the presence of drilling mud than barium, chloride was found at levels above the average in RP-1A and -1B. Since sodium chloride is a common additive to saltwater-based drilling muds (Dames and Moore, 1982), the elevated levels of chloride in these samples suggests the presence of drilling mud in this area.

Plate 8 was developed on the basis of the aforementioned findings, and provides an estimate for the locations of the dehydrator pit and the drilling mud reserve pit. Since the sampling density was insufficient to provide a detailed location for each of these features, these units have been approximately plotted on Plate 8, and their exact boundaries may be significantly different from those presented on the map.

4.0 RISK ASSESSMENT

In establishing priorities for remediation or monitoring, it is important to consider the health risk associated with a specific sample or location. In most cases, relatively high concentrations of contaminants must be present to constitute an acute health hazard. However, extremely low dose levels of chronic toxicants can present a significant risk if exposure occurs over the lifetime of the organism. The chemical constituents and concentrations of soil and water samples have been reviewed in order to estimate their chronic toxic potential. The lifetime cancer risk associated with consumption of the various chemicals detected in soil and groundwater samples at the Manana - Mary Wheeler #1-E well site has been estimated using the procedures of Crouch et al. (1983). This procedure can be used to estimate the risk of individual chemicals, as was done for the soil samples; or, the procedure can be used to estimate the cumulative cancer risk for mixtures of chemicals, as was done for the groundwater samples. The risk equation takes into account the carcinogenic potential of each chemical, the variability of the data used to estimate carcinogenic potential, and the concentration of the chemical. The major limitations of this equation are that extrapolations must be made from the high dose used in animal testing to the low dose which occurs in most environmental samples; and, extrapolations must be made from the animal species in which toxicity testing was conducted and humans for which the risk is being estimated.

For groundwater, the risk equation assumes that a 70 kg human will consume 2 liters of water per day for an entire lifetime. The equation can be used to estimate the mean, median, and 98th percentile risk. The mean risk is typically used to assess the hazard of individual chemicals or

mixtures in most groundwater samples. The median risk is usually less than the mean risk, and should only be used if the risk of human exposure is extremely low; while, the 98th percentile risk is a conservative estimate and can be used if potable water wells are believed to be within the plume of contaminated groundwater. For the purposes of this review, the mean risk will be used.

4.1 SOIL

The results from the estimation of risk for individual chemicals detected in the soil are provided in Table 4-1. The oral rat lethal dose or tumorigenic dose for chrysene and acenaphthene could not be located in the literature. However, chrysene is described as a potential carcinogen (Lewis and Tatken, 1984). Thus, the carcinogenic potential for chrysene should be comparable to that for fluoranthene. In addition, a comparison based on chemical structure suggests that the carcinogenic potential of acenaphthene should be comparable to naphthalene. The adsorptive properties of soil should prevent a significant amount of these chemicals from reaching groundwater. However, in order to provide a higher level of security, soil samples will be considered to present a potential risk to human health if the soil concentration incurs an estimated risk of greater than 10 in a million. I = M + IOO, O = 0

Three soil samples contained a concentration of chemical with an $1 \times (0,000)$ estimated risk above a mean of 100 in a million. Soil sample P-N contained 178 ppb fluoranthene which incurs an estimated risk of 148 in a million (Table 4-1). The risk associated with chrysene is likely equal to that for fluoranthene in this soil sample. The estimated risk associated with fluoranthene in soil sample T-1W is 137 in a million; this sample also contained xylene at a concentration which incurs an estimated risk of 1 in

#1	-E Well Site.				
Sample I.D.	Constituent	Conc. (ppb)	Mean R	Median R	98th Percentile R98
P-N	Fluoranthene	178	1.48E-04	2.21E-06	7.29E-04
	Chrysene	118			
T-1W	Fluoranthene	165	1.37E-04	2.05E-06	6.76E-04
T-2E	Napthalene	3,901	2.79E-05	2.65E-06	2.04E-04
	Acenapthene	3,584			
BG-1	1,2-Dichloropropane	610	7.07E-06	1.03E-07	3.45E-05
P-N	Toluene	1,200	1.61E-06	4.23E-07	1.10E-05
	Xylene	17,800	2.54E-05	7.05E-06	1.73E-04
(P-W)	Benzene	2,600	3.20E-06	1.04E-06	2.09E-05
	Toluene	34,300	4.59E-05	1.24E-05	3.15E-04
	Xylene	177,200	2.52E-04	7.02E-05	1.72E-03
P-S	Chlorobenzene	370	3.37E-06	1.48E-07	2.20E-05
	Xylene	760	1.08E-06	3.01E-07	7.38E-06
P-E	Xylene	2,100	2.99E-06	8.32E-07	2.04E-05
T-1W	Xylene	730	1.04E-06	2.89E-07	7.09E-06
T-1C	Toluene	160	2.14E-07	5.76E-08	1.47E-06
T-1E	Xylene	980	1.40E-06	3.88E-07	9.52E-06
RP-1B	Vinyl chloride	4,300	1.14E-04	3.44E-05	7.64E-04
T-2C	Toluene	260	3.48E-07	9.36E-08	2.39E-06
		940	1.40E-06	3.72E-07	9.13E-06
T-2E	Benzene	220	2.71E-07	8.80E-08	1.77E-06
	Toluene	350	4.68E-07	1.26E-07	3.47E-06
T-3C	Chlorobenzene	190	1.73E-06	7.60E-08	1.13E-05

Table 4-1. Risk Factors for Soil Samples Collected at the Manana - Mary Wheeler #1 E Wall Site

Vongene 3.2×10⁻⁶ mean 1.0+×10⁻⁶ medinen 20.8×10⁻⁶ 98TH

a million (Table 4-1). The maximum risk associated with a soil sample at the Manana - Mary Wheeler #1-E well site was 252 in a million for xylene in soil sample P-W. This sample also had a relatively high risk for toluene (45.9 in a million). The concentration of vinyl chloride in soil sample RP-1B incurs an estimated risk of 114 in a million (Table 4-1). This soil may present the greatest risk of those investigated, as vinyl chloride is a suspected human carcinogen with a high vapor pressure. Thus, the potential for exposure via either air or groundwater exists.

Other soil samples with chemicals at a concentration which incurs an estimated risk of greater than 10 in a million include T-2E (naphthalene's risk is 28 in a million), P-N (xylene's risk is 25 in a million), and P-W (toluene's risk is 46 in a million). Thus, the soil sampling locations for which chemical concentrations suggest the greatest estimated carcinogenic risk appear to be P-N, T-1W, P-W and RP-1B (Table 4-1).

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4.2 GROUNDWATER

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The presence of toxic chemicals in groundwater presents a more imminent risk to human health than does their presence in soil. Thus, any groundwater sample with a mean risk of greater than 1 in a million may indicate the need for continued monitoring at a minimum. At the conclusion of the risk assessment, it was noted that the maximum carcinogenic risk estimated for groundwater at the Mary Wheeler #1-E site is no greater than that estimated for drinking water from several large cities. The concentration of indeno(1,2,3-c,d)pyrene in sample EPNG-4 incurs an estimated risk of 14.8 in a million. Methylene chloride, which has been suggested to have been introduced by the analytical laboratory, incurs an estimated risk of 47.8 in a million at a concentration of 2100 ppb in water sample EPNG-1 (Table 4-2). The maximum estimated risk for a water sample

TTT	-E well Site.	,			004
]		16.	16.11	98th
Sample		Conc.	Mean	Median	Percentile
<u> </u>	Constituent	(ppb)	<u> </u>	R	<u>R98</u>
EPNG-1	Methylene chloride	2.1 2,100	4.78E-05	2.10E-06	3.12E-04
	Xylene	0.34 340	4.83E-07	1.35E-07	3.30E-06
EPNG-2A	Benzene	8.1 8,100	9.98E-06	3.24E-06	6.51E-05
]	Ethylbenzene	37,4 37,400	1.89E-05	5.09E-06	1.30E-04
	Xylene	192,400	2.74E-04	7.62E-05	1.87E-03
EPNG-2B	Benzene	1,6 1,600	1.97E-06	6.40E-07	1.29E-05
	Ethylbenzene	1,200	6.06E-07	1.63E-07	4.17E-06
	Xylene	12,100	1.72E-05	4.79E-06	1.18E-04
EPNG-3	Benzene	0,4 400	4.93E-07	1.60E-07	3.21E-06
	Ethylbenzene	4.3 4,300		2.17E-06	1.49E-05
	Xylene	13.54 13,540	1.93E-05	5.36E-06	1.32E-04
	Toluene	0.33 330	4.41E-07	1.19E-07	3.03E-06
EPNG-4	Benzene	6.9 5 950	1.17E-06	3.80E-07	7.63E-06
3	Benzo(b)fluoranthene	V /2	5.50E-07	7.44E-08	4.06E-06
	Indeno(1,2,3-cd)pyrene	[√] 6	1.48E-05	2.23E-07	7.37E-05
S-5	Benzene	0.260 260	3.20E-07	1.04E-07	2.09E-06
	Toluene	0.320320	4.28E-07	1.15E-07	2.94E-06

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 Table 4-2. Risk Factors for Water Samples Collected at the Manana - Mary Wheeler

 #1-E Well Site.

2,74×10-6 274×10-6

was incurred by sample EPNG-2A. For this sample, the concentration of xylene yields an estimated cancer risk of 274 in a million, and ethylbenzene 18.9 in a million (Table 4-2). Xylene in samples EPNG-2B and EPNG-3 is present at concentrations which incur estimated risks of 17.2 in a million and 19.3 in a million, respectively.

The mean estimated cumulative cancer risk for the mixtures of chemicals in the groundwater samples (see Table 4-3) ranged from a low of 1.8×10^{-4} in a million for sample OCD-1 to the high of 301 in a million for the mixture of chemicals in sample EPNG-2A. Samples EPNG-4, S-1, OCD-1, and S-5 had an estimated risk of less than one in a million. Crouch et al. (1983) suggest that a person exposed to a risk of 1 in a million per year has a life expectancy reduced by only one day. In addition, their review of drinking water quality from cities in the United States indicates that the mean annual cancer risk was greater than one in a million for all 25 cities investigated (Crouch et al., 1983).

Five groundwater samples incurred an estimated risk which was appreciably greater than 1 in a million. In three of the more contaminated samples (EPNG-2A, EPNG-2B and EPNG-3), the majority of the risk estimated for the mixture was associated with the presence of xylene. Xylene has been found to induce tumors when fed to rats (Maltoni et al., 1985). These data indicate that several wells at the Manana - Mary Wheeler #1-E well site may present a threat to human health if the plume of contamination reaches wells used for the production of drinking water. However, drinking water from 5 of 25 cities reviewed by Crouch et al. (1983) had estimated cancer risks of greater than 100 in a million.

Well	Risk (x 10^6)*		
I.D.	Mean	Median	98th Percentile
EPNG-1	48.8	2.7	375
EPNG-2A	301	107	2040
EPNG-2B	19.8	7.56	134
EPNG-3	22.5	8.4	148
EPNG-4	13	0.59	93.2
OCD-1	1.80E-04	5.40E-06	1.10E-03
S-1	2.20E-04	6.60E-06	1.33E-03
S-5	0.75	0.03	4.48

 Table 4-3. Estimated Cumulative Cancer Risk of Drinking Groundwater from

 Selected Wells at the Manana - Mary Wheeler #1-E Well Site.

* Carcinogenic risk estimated using procedures of Crouch et al. (1983) based on a 70-kg human consuming 2-l of water per day for 70 years.

5.0 CONCLUSIONS

The investigation of the Manana - Mary Wheeler #1-E well site began with a desktop effort, whereby existing information from OCD and EPNG files was compiled and studied in an effort to guide the subsequent field work and analytical testing.

Following this task, trenches were excavated via backhoe to expose the unsaturated, cobbley sand beneath the site to aid in the evaluation of the extent of subsurface hydrocarbon contamination. At the outset, the intent of this task was to dig trenches transverse to the principal direction of migration of the plume so that the lateral and vertical extent of this feature could be mapped. Additionally, this methodology was used to investigate the area thought to have accommodated the drilling mud reserve pit. A structured soil sampling program was conducted concurrent with the trenching exercise, in which a sample of soil was collected from the saturated/unsaturated zone interface at three locations in the trenches: one at each end, and one in the approximate center of the pit.

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Once the excavation phase was complete, four new groundwater monitoring wells were installed at about the same level as the existing OCD-series wells. With the exception of the upgradient well, these wells were positioned inside the area where hydrocarbon staining was visible. Each of these new monitoring wells, in addition to selected OCD wells and Flora Vista Water Users Association production wells, was pumped or bailed for a period of time deemed to be sufficient to collect groundwater samples representative of formation water quality.

Each sample, for both soil and water, was submitted to an analytical laboratory where it was subjected to seven major chemical analyses:

1. Inorganics (soluble cations/anions, pH, EC, etc.);

- 2. Heavy metals (barium, cadmium, chromium, and selenium);
- 3. Aromatic volatile organics;
- 4. Halogenated volatile organics;
- 5. Chlorinated hydrocarbons;
- 6. Ethylene and diethylene glycol; and
- 7. Polynuclear aromatic hydrocarbons.

5.1 DEHYDRATOR PIT

Visual inspection of the dehydrator pit area, exposed during trenching activities, indicated the presence of hydrocarbon contamination of the soil between the ground surface and the water table. Oily materials were noted from a level as shallow as 12 inches below the ground surface, to as deep as 5.4 feet, which coincided with the water table in this area.

The major constituents detected in soil samples taken from the trenches were oil and grease; the aromatic volatiles, benzene, toluene, xylene, and chlorobenzene; and the polynuclear aromatic hydrocarbons, fluoranthene and chrysene.

Based on the results of the soil and groundwater sampling and analysis program, and on a review of the operating records of the production units, it appears that the principal source for the hydrocarbon contamination at the Manana - Mary Wheeler #1-E well site is the unlined dehydrator pit. The result of discharging hydrocarbon liquids into the pit was the development of a plume of oily material that, over the course of the three years that the practice was in operation, seeped through the coarsegrained, high-permeability materials comprising the bottom and side slopes of the pit. This plume subsequently moved through the unsaturated zone and ultimately migrated to a level coincident with the water table. The bulk

motion of the flowing groundwater carried the plume downgradient toward the production well field.

5.2 DRILLING MUD RESERVE PIT

The contrast in chromium concentration between soil samples taken near the area believed to be the reserve pit, and the balance of the soil samples, suggests that chromium is present in this area at levels above what is considered to be characteristic of background conditions. Also, owing to the fact that chromium is a component of certain drilling mud additives, it appears likely that the trenches excavated in this area were located, at least in part, inside the boundaries of the drilling mud reserve pit. Additional evidence supporting this assertion includes the observance of relatively-high oil and grease, and chloride, concentrations in the soil samples taken from this area. Buried debris, such as concrete fragments and scrap pipe, unearthed during the trenching effort, serves to temper the claim that the reserve pit had been identified during the site investigation.

5.3 GROUNDWATER

An analysis of groundwater samples collected from the newly-installed monitoring wells, OCD's monitoring wells, and selected production wells, indicates that the greatest concentration of volatile organic compounds lies within the bounds of the visible hydrocarbon plume.

Methylene chloride, a commonly-used laboratory solvent, was detected in three groundwater samples, all of which are located outside the plume boundaries. It is very likely that the identification of this compound can be attributed to its usage in sample container decontamination by the analytical laboratory.

This section is aimed at addressing the procedures necessary to implement reclamation measures at the Manana - Mary Wheeler #1-E well site. As mandated by the New Mexico Oil Conservation Division, El Paso Natural Gas Company must meet the following clean-up criteria (Boyer, 1988):

- Dissolved, emulsified, and free-floating petroleum, and other organic and inorganic water contaminants, must be removed from the groundwater such that:
 - a) the water quality standards of Section 3-103 of the New Mexico Water Quality Control Commission Regulations (as amended through December 24, 1987) are met; and
 - b) the USEPA drinking water standards for public water supplies in effect as of June 15, 1988; and
 - c) undesirable odors attributable to loss of petroleum or other fluids from the site are not present in groundwater.
- The unsaturated (vadose) zone in the vicinity of the 2. contamination shall not contain drilling muds, inorganic salts, heavy metals, or hydrocarbons in quantities sufficient to recontaminate groundwater. Contamination shall be deemed to occur if State or Federal numerical standards are exceeded, or through continued presence or reappearance of oil or grease, or undesirable odors in the water supply. Such recontamination shall not be allowed to occur as a result of seasonal rises in the water table, drainage, recharge events, or in any other Soils contaminated with drilling muds, salts, heavy manner. metals, or hydrocarbons, and needing to be removed to prevent continued or future contamination of groundwater, shall be excavated and disposed in locations approved in advance by OCD. Clean fill material may need to be provided to replace contaminated soils. Pumping of the affected water supply well for some length of time may be necessary to verify successful clean-up.

The sections that follow will address each of these concerns.

6.1 RECLAMATION TECHNOLOGIES

The principal technology proposed for implementation at the site is excavation, via heavy equipment, of contaminated soils. Although several alternative technologies were considered, such as <u>in situ</u> soil treatment and injection of surfactants, it was EPNG's contention that these

types of actions would not unequivocally satisfy the above-listed criterion. Thus, a more traditional approach has been adopted.

6.1.1 Contaminated Soil

Soils considered to be contaminated at the Manana - Mary Wheeler #1-E well site include the plume of visible hydrocarbon staining (including the dehydrator pit area), and the reserve pit. EPNG proposes that these areas be fully excavated such that all visible contaminated materials are removed.

Determination of what constitutes contamination will, in large part, be guided by three criterion. The first will be the results of the site investigations, which are discussed in this report. This information will establish the first area to be addressed in the remedial action process.

The second criterion will be visual evidence. In many areas, determination of where subsurface contamination exists is clearly evident upon visual inspection of the subsurface. Therefore, that material which can be categorized as contaminated using visual means will be excavated.

The third criterion will be laboratory results. To verify that the excavation process is successfully removing the contaminated material, soil samples will be collected concurrent with the excavation operations to for dealer quantify the level of contamination. The sum total of following these criteria will, to a large degree, insure that the contaminated materials are removed.

To accomplish the removal of the contaminated soil, EPNG will use conventional heavy equipment to strip the uncontaminated overburden material to facilitate access to the underlying contaminated soil. As the clean overburden is removed, it will be stock-piled on-site, with the intent of replacing it in the excavation once clean-up activities are completed.

As the contaminated material is removed from the excavation, it will assume one of two dispositions: 1) the contaminated soil will be stock- Where piled on-site while it awaits testing and ultimate removal to a designated treatment/disposal site, or 2) the contaminated soil will be placed directly into awaiting trucks for delivery to the treatment/disposal site. The first option provides a means for screening the soils that are removed from the site, which subsequently precludes the unnecessary disposal of clean soil. In either case, the intent of the removal of the contaminated soil will be to render the site "clean" within the framework established by the applicable guidelines, as stated in the preceding section.

6.1.2 Contaminated Groundwater

In its present state, the groundwater that is resident in the alluvial aquifer beneath the Manana - Mary Wheeler #1-E well site has been impacted in two principal areas: 1) the area surrounding the zone of visible hydrocarbon staining, and 2) the area adjacent to S-5. , However, none of the measured contaminants were found to exceed WQCC standards. Thus, no 6.2 DISPOSITION OF WASTE W/ Lister Conte Configuration HC W/ Tikely distribution of the site will generate large amounts of soll action regarding groundwater is needed.

needing treatment and/or disposal. Hence, all soil, documented as contaminated jheent, through the aforementioned screening procedure, will be removed from the site for disposal at an acceptable location. The facility selected to receive the excavated soil will be presented to OCD for approval prior to the commencement of remedial activities.

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6.3 MONITORING

Throughout the remedial action process, samples will be collected to verify the effectiveness of the clean-up effort. The intent of the

sampling exercise is to verify, quantitatively, the condition of the site during and after remediation of the site. More specifically, the intent of the soil and groundwater samples will be to document adherence to the WQCC standards. and find the formula.

6.3.1 <u>Soil</u>

During the remediation process, soil samples will be periodically taken to verify that contaminated soil has been completely excavated. The principal objective of the soil sampling exercise is to demonstrate the equivalent of "clean closure." In addition to establishing the condition of the site, the samples collected for analysis will serve as a tool for for the form guiding the excavation program.

Once the soil exhibiting visual evidence of contamination has been when the surface of the earth-moving equipment, soil samples will be obj? taken from the surface of the bottom of the excavation. These samples will surface of the bottom of the excavation. These samples will surface of the bottom of the excavation of spatulas, static st

Immediately after sampling, the location where the sample was taken, time, date, and depth of the sample below grade and below the bottom of the excavation, will be recorded on a map of the site and in the field logbook. If the presence of contaminants is confirmed at the conclusion of the laboratory analysis, this information will be used to direct continued excavation operations. This cycle will be repeated until the soil samples comply with WQCC standards.

6.3.2 Groundwater

Groundwater samples will be collected prior to the start of any of the clean-up tasks; this will establish baseline groundwater quality

conditions. Since many of the monitoring wells currently inplace at the Manana - Mary Wheeler #1-E well site are located in areas where excavation is required, it follows that, for complete clean-up, these wells will be necessarily removed during the remediation effort.

It is proposed that replacement monitoring wells be installed in strategically-chosen areas at the conclusion of all excavation activities. These wells, as well as those that remain after the earthwork, will serve to provide EPNG with information regarding the behavior of the plume across the site in response to the recovery effort.

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At the conclusion of the excavation activities, all available groundwater monitoring wells will be sampled in accordance with the procedures described in Section 3.4.2. The frequency with which these samples are taken from both the recovery and monitoring wells is addressed in Section 6.3.4.

6.3.3 Analytical Parameters

Hydrocarbon liquids constitute the primary contaminant of concern at the Manana - Mary Wheeler #1-E well site. For this reason, it is proposed that the list of constituents to be measured on soil and water samples be limited to the BTEX compounds, total petroleum hydrocarbons (TPH), and certain indicator parameters, such as pH and EC. The data presented in Section 3.5 indicate that these parameters were the most commonly-observed during the site investigation. Measurement of these constituents will provide evidence for the persistence or absence of petroleum-based or petroleum-derived compounds in the subsurface.

As mentioned previously, an on-site mobile laboratory will be utilized to effect rapid turnaround times for sample analyses (e.g., less than 24 hours). By maximizing turnaround times, the maximum use of the earth-

moving equipment can be made in the least amount of time. Additionally, the length of time that any excavation remains open will be minimized by acquiring verification sampling results rapidly.

The analytical protocols used during the implementation of remedial measures will be consistent with those reported in SW-846.

6.3.4 <u>Sampling Frequency</u>

Before any remedial activities are begun, the oversight/monitoring team will collect groundwater samples from all of the EPNG- and OCD-series monitoring wells, and from S-1 and S-5. Additional groundwater sampling will be deferred until the conclusion of all excavation activities. At this time, replacement groundwater monitoring wells will be installed and sampled. Any monitoring wells remaining on-site will be sampled, in Sumplu addition to S-1 and S-5, and the recovery wells.

It is proposed that subsequent groundwater samples be taken quarterly in an effort to verify that constituent concentrations (Section 6.3.3) remain below WQCC standards. If, for two consecutive quarters, the constituent concentrations remain below WQCC standards, EPNG proposes that groundwater sampling be discontinued.

The collection of soil samples will be performed on a daily basis during excavation operations. Each day, samples will be collected by the oversight/monitoring team, and delivered to the field laboratory for analysis. Soil sampling will be terminated after all contaminated soils have been fully excavated. NET

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6.3.5 <u>Quality Control</u>

The quality control program to be followed for implementation of this plan calls for a multi-pronged approach, consisting primarily of analytical laboratory accuracy and precision verification, and documentation/ reporting.
To verify the accuracy and precision of the laboratory results reported both during and after remediation, standard quality control measures will be employed. The procedures to be adopted include the use of known spike samples, the analysis of duplicate samples, and the submittal of blind control blanks. All of the quality control data will be included with the laboratory results in support of the analytical efforts.

A field logbook will be maintained by the oversight/monitoring team during the remedial action plan implementation. This book will provide a means for permanently recording information such as prevailing weather conditions, personnel present on-site, location of samples, estimates for daily soil removals, and other significant observations. The field logbook will represent a complete record of the events that occurred throughout the implementation of the remedial action plan.

As a companion document to the field logbook, the site map will serve as a medium for recording such data as sample location, time, date, and depth. This map will be prepared by the oversight team prior to entering the field, and will be plotted to a scale that will adequately accommodate detailed entries. As with the field logbook, the site map will constitute a permanent record of the remediation activities.

Extensive use of photography will be made to provide additional documentation of the remediation process. Color 35 mm slides will be taken of each segment of the remediation program, such as excavation and stockpiling of overburden, excavation and loading of contaminated soil into transport vehicles, soil and groundwater sampling activities, and backfilling of excavations with clean soil. Since many photographs will be taken, the camera used will be equipped with a means of placing a time and date stamp directly onto the film (i.e., a "data back"). Details regarding each photograph will be entered into the field logbook.

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At the end of each work day, reports will be prepared by the monitoring/oversight team from the field logbook and the site map. These reports will include such information as the number and location of samples taken that day, estimates of the volumes of overburden excavated and stockpiled, and estimates of the volume of contaminated soil transported to the disposal facility.

At the conclusion of the excavation efforts, the oversight/monitoring team will prepare a detailed report of the entire remedial action program as executed by EPNG and its contractors. This document will consist of tabulations of analytical data, excavated earth volumes, groundwater elevations, and other significant findings of the program. All photographs will be compiled and properly labeled with identifiers, and an attendant photograph log will prepared. A copy of the field logbook will be attached to the report as an appendix.

In an effort to enhance communications between OCD and EPNG, the oversight/monitoring team will prepare quarterly reports describing the status of the groundwater quality specific to the Manana - Mary Wheeler #1-E well site. These documents will contain summary tables and graphs of the data generated during the groundwater monitoring program. Along with the data, the reports will provide narrative descriptions and data interpretations. If the data are sufficient, isopleth maps of selected constituents will also be presented.

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APPENDIX A Plates

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Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-1 East		Date	Sampled:	06/12/89
Laboratory Number:	C89021	Date	Received:	06/19/89
Analysis Requested:	8100	Date	Extracted:	06/23/89
Sample Matrix:	Soil	Date	Analyzed:	06/23/89
Preservative:	None			
Condition:	Cool			
			Det.	

Farameter	Concentration	Limit	Units
Naphthalene	ND	0.180	 mg∕kg
Acenaphthalene	ND	0.230	mą∕ką
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg/kg
Phenanthrene	ND	0.100	mg/kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg/kq
F'yrene	ND	0.100	ma∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg/kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg/kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Farameter not detected at the stated detection limit.

viewed by Jack Morgan, Organic Chemist



Client: K.W.BROWN AND ASSOCIATES

Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945

Report Date: 08/02/89

Sample ID: T-1 Center Date Sampled: 06/12/89 Laboratory Number: C89022 Date Received: 06/19/89 Analysis Requested: 8100 Date Extracted: 06/23/89 Sample Matrix: Soil Date Analyzed: 06/26/89 Preservative: None Condition: Cool Det. Parameter Concentration Limit Units ---------------ND 0.180 Naphthalene mq∕kq

The same part of the top same the same to same	b 10 mars	47° 44° 446° 446° 75	
Acenaphthalene	ND	0.230	ma∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg∕kg
Fhenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Jack Morgan, Organic Chemist



Report Date: 08/02/89

0.100

0.100

mg/kg

mg/kg

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-1 West Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89023 8100 Soil None Cool			Date Date	Sampled: Received: Extracted: Analyzed:	06/12/89 06/19/89 06/23/89 06/26/89
					Det.	
Farameter		Concer	itration		Limit	Unite
Naphthalene		ND			0.180	mg∕kg
Acenaphthalene		ND			0,230	mg/kg
Acenaphthene		ND			0,180	mg∕kg
Fluorene		ND			0,100	mg∕kg
Phenanthrene		ND			0.100	mg∕kg
Anthracene		ND			0.100	mg/kg
Fluoranthene		0.i	.65		0.100	mg∕kg
Fyrene		ND			0.100	mg/kg
Benzo(a)Anthracene		ND			0.100	mg∕kg
Chrysene		ND			0.100	mg∕kg
Benzo(b)fluoranthen	e	ND			0.100	mg∕kg
Benzo(k)fluoranthene	Ð	ND			0.100	mg∕kg
Benzo(a)pyrene		ND			0.100	mg∕kg
Dibenzo(a,h)anthrace	ene	ND			0.100	mg∕kg .
Indeno(1,2,3-cd)pyre	ene	ND			0.100	mg∕kg
Benzo(ghi)perylene		ND			0.100	mg∕kg
Benzo(j)fluoranthen		ND			0.100	mg∕kg
Dibenz(a,h)acridine		ND			0.100	mg∕kg
Dibenz(a,j)acridine		ND			0.100	mg∕kg
Dibenz(a,e)pyrene		ND			0.100	mg∕kg
Dibenz(a,h)pyrene		ND			0.100	mg∕kg

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

ND

ND

Comments:

Dibenz(a,i)pyrene

3-Methylcholanthrene

by Jack Morgan, Organic Chemist Re





Fluorene	ND	0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Pyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	ma∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-2 Cent Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89025		Date Date	Sampled: Received: Extracted: Analyzed:	06/12/89 06/19/89 06/23/89 07/14/89
	beer take over the			Det.	
Parameter		Concentration		Limit	Units
Naphthalene		ND		0.180	mg/kg
Acenaphthalene		ND		0.230	mo/kg
Acenaphthene		ND		0.180	mg∕kg
Fluorene		ND		0.100	ma∕kg
Fhenanthrene		ND		0.100	mg∕kg
Anthracene		ND		0.100	mg∕kg
Fluoranthene		ND		0.100	mg∕kg
Pyrene		ND		0.100	mg∕kg
Benzo(a)Anthracene		ND		0.100	mą∕ką
Chrysene		ND		0.100	mg∕kg
Benzo(b)fluoranthen		ND		0.100	mg∕kg
Benzo(k)fluoranthen	e	ND		0.100	mg∕kg
Benzo(a)pyrene		ND		0.100	mg∕kg
Dibenzo(a,h)anthrac		ND		0.100	mg∕kg
Indeno(1,2,3-cd)pyr	ene	ND		0.100	mg∕kg
Benzo(ghi)perylene		ND		0.100	mg∕kg
Benzo(j)fluoranthen		ND		0.100	mg∕kg
Dibenz(a,h)acridine		ND		0.100	mg/kg
Dibenz(a,j)acridine	1	ND		0.100	ma∕ka
Dibenz(a,e)pyrene		ND		0.100	mg/kg
Dibenz(a,h)pyrene		ND		0.100	mg∕kg
Dibenz(a,i)pyrene		ND		0.100	mg∕kg
3-Methylcholanthren	e	ND		0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-2 West Laboratory Number: C890 Analysis Requested: 8100 Sample Matrix: Soil Preservative: None Condition: Cool	2	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/19/89 06/23/89 06/26/89
Parameter	Concentration	Det. Limit	Units
Naphthalene Acenaphthalene Acenaphthalene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)Anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene Benzo(ghi)perylene Benzo(j)fluoranthene Dibenz(a,h)acridine Dibenz(a,j)acridine Dibenz(a,e)pyrene Dibenz(a,h)pyrene Dibenz(a,i)pyrene S-Methylcholanthrene	ND ND ND ND ND ND ND ND ND ND ND ND ND N	$\begin{array}{c} 0.180\\ 0.230\\ 0.180\\ 0.100\\ 0.00\\$	mg/kg mg/kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

by Jack Morgan, Organic Chemist



08/02/89

Report Date:

K.W.BROWN AND ASSOCIATES Client: Sample ID: 7-3 East Date Sampled: 06/13/89 Laboratory Number: 089027 Date Received: 06/19/89 Analysis Requested: 8100 Date Extracted: 06/23/89 Sample Matrix: 07/27/89 Soil Date Analyzed: Preservative: None Condition: Cool Det. Parameter Concentration Limit Units ----------------Naphthalene ND 0.180mq/kq Acenaphthalene ND 0.230 mq/kq 0.180 Acenaphthene ND mq∕kq Fluorene ND 0.100 ma/ka P'henanthrene ND 0.100 mg/kg Anthracene MD 0.100 mq/kq 0.100 Fluoranthene ND mg/kg Fyrene ND 0.100 ma/ka ND 0.100 Benzo(a)Anthracene mq/kg Chrysene ND 0.100 mg/kg 0.100 Benzo(b)fluoranthene ND mg∕kg Benzo(k)fluoranthene ND 0.100 mg∕kg Benzo(a)pyrene ND 0.100 mg/kg 0.100 Dibenzo(a,h)anthracene ND mg/kg Indeno(1,2,3-cd)pyrene 0.100 ND mq/kq Benzo(ghi)perylene ND 0.100 mq/kq Benzo(j)fluoranthene 0.100 ND mq/kq Dibenz(a,h)acridine ND 0.100 mq∕kg Dibenz(a,j)acridine ND 0.100 mq/kq Dibenz(a,e)pyrene ND 0.100 mg∕kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,i)pyrene ND 0.100 mg/kg 3-Methylcholanthrene ND 0.100 mg∕kg

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-3 Cent		Date	Sampled:	06/13/89
Laboratory Number:	C89028	Date	Received:	06/19/89
Analysis Requested:	8100	Date	Extracted:	06/23/89
Sample Matrix:	Soil	Date	Analyzed:	07/14/89
Preservative:	None			
Condition:	Cool			

Farameter	Concentration	Limit	Units
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	0.230	mg∕kg
Acenaphthene	ND	0.180	mą∕kg
Fluorene	ND	0.100	mq/kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Pyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by Jack Morgan, Organic Chemist

int
Inter-Mountain
Laboratories, Inc.

06/13/89

06/19/89

07/14/89

Report Date: 08/02/89

Date Extracted: 06/23/89

Date Sampled:

Date Received:

Date Analyzed:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-3 West	
Laboratory Number:	C89029
Analysis Requested:	8100
Sample Matrix:	Scil
Preservative:	None
Condition:	Cool

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.180	mg/kg
Acenaphthalene	ND	0.230	mg∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg/kg
Fluoranthene	ND	0.100	mg/kg
Fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0,100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0,100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0,100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0,100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-4 EastDate Sampled:06/13/89Laboratory Number:C89030Date Received:06/19/89Analysis Requested:8100Date Extracted:06/23/89Sample Matrix:SoilDate Analyzed:07/14/89Preservative:NoneCoolDate Analyzed:07/14/89

Parameter	Concentration	Limit	Unit≘
aller and and and the set of the set	allers and a term term , appending appending the state which which are appending		
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	0.230	mg∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method B100, Polynuclear Aromatic Hydrocarbons, SW-846. USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



06/13/89

06/19/89

Report Date: 08/02/89

Date Extracted: 06/26/89

Date Analyzed: 07/17/89

Date Sampled:

Date Received:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-4 Center Laboratory Number: C89031 Analysis Requested: 8100 Sample Matrix: Soil Preservative: None Condition: Cool

Naphthalene ND 0.180 mg/kg Acenaphthalene ND 0.230 mg/kg Acenaphthalene ND 0.180 mg/kg Fluorene ND 0.100 mg/kg Phenanthrene ND 0.100 mg/kg Anthracene ND 0.100 mg/kg Fluoranthene ND 0.100 mg/kg Fyrene ND 0.100 mg/kg Benzo(a)Anthracene ND 0.100 mg/kg Benzo(a)Anthracene ND 0.100 mg/kg Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a,h)anthracene ND 0.100 mg/kg Dibenz(a,h)artracene ND 0.100 mg/kg Benzo(j)fluoranthene	Parameter	Concentration	Limit	Units
Acenaphthalene ND 0.230 mg/kg Acenaphthene ND 0.180 mg/kg Fluorene ND 0.100 mg/kg Phenanthrene ND 0.100 mg/kg Anthracene ND 0.100 mg/kg Fluoranthene ND 0.100 mg/kg Fyrene ND 0.100 mg/kg Benzo(a) Anthracene ND 0.100 mg/kg Chrysene ND 0.100 mg/kg Benzo(b) fluoranthene ND 0.100 mg/kg Benzo(b) fluoranthene ND 0.100 mg/kg Benzo(a) pyrene ND 0.100 mg/kg Dibenzo(a,h) anthracene ND 0.100 mg/kg Benzo(jifluoranthene ND 0.100 mg/kg Benzo(jifluoranthene		1997 - 19		
Acenaphthene ND 0.180 mg/kg Fluorene ND 0.100 mg/kg Phenanthrene ND 0.100 mg/kg Anthracene ND 0.100 mg/kg Anthracene ND 0.100 mg/kg Fluoranthene ND 0.100 mg/kg Pyrene ND 0.100 mg/kg Benzo(a)Anthracene ND 0.100 mg/kg Chrysene ND 0.100 mg/kg Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(k)fluoranthene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a)hanthracene ND 0.100 mg/kg Benzo(a)hjerylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Benzo(j)fluoranthene				
Fluorene ND 0.100 mg/kg Phenanthrene ND 0.100 mg/kg Anthracene ND 0.100 mg/kg Fluoranthene ND 0.100 mg/kg Fyrene ND 0.100 mg/kg Benzo(a)Anthracene ND 0.100 mg/kg Chrysene ND 0.100 mg/kg Benzo(a)Anthracene ND 0.100 mg/kg Benzo(a)Anthracene ND 0.100 mg/kg Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Dibenzo(a,h)anthracene ND 0.100 mg/kg Indeno(1, 2, 3-cd)pyrene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(jfluoranthene ND 0.100 mg/kg Bibenz(a,h)acridine ND 0.100 mg/kg Dibenz	•			
Phenanthrene ND 0.100 mg/kg Anthracene ND 0.100 mg/kg Fluoranthene ND 0.100 mg/kg Fyrene ND 0.100 mg/kg Benzo(a) Anthracene ND 0.100 mg/kg Chrysene ND 0.100 mg/kg Benzo(b) fluoranthene ND 0.100 mg/kg Benzo(k) fluoranthene ND 0.100 mg/kg Benzo(a) pyrene ND 0.100 mg/kg Benzo(a) pyrene ND 0.100 mg/kg Benzo(a) pyrene ND 0.100 mg/kg Dibenzo(a, h) anthracene ND 0.100 mg/kg Benzo(ji) perylene ND 0.100 mg/kg Benzo(ji) fluoranthene ND 0.100 mg/kg Bibenz(a, h) acridine ND 0.100 mg/kg Dibenz(a, j) acridine ND 0.100 mg/kg Dibenz(a, h) pyrene ND 0.100 mg/kg	Acenaphthene	ND	0.180	mg∕kg
Anthracene ND 0.100 mg/kg Fluoranthene ND 0.100 mg/kg Fyrene ND 0.100 mg/kg Benzo(a) Anthracene ND 0.100 mg/kg Chrysene ND 0.100 mg/kg Benzo(b) fluoranthene ND 0.100 mg/kg Benzo(k) fluoranthene ND 0.100 mg/kg Benzo(a) pyrene ND 0.100 mg/kg Benzo(a) pyrene ND 0.100 mg/kg Benzo(a, h) anthracene ND 0.100 mg/kg Dibenzo(a, h) anthracene ND 0.100 mg/kg Benzo(ghi) perylene ND 0.100 mg/kg Benzo(ghi) perylene ND 0.100 mg/kg Dibenz(a, h) acridine ND 0.100 mg/kg Dibenz(a, j) acridine ND 0.100 mg/kg Dibenz(a, h) pyrene ND 0.100 mg/kg Dibenz(a, h) pyrene ND 0.100 mg/kg	Fluorene	ND	0.100	mg∕kg
Fluoranthene ND 0.100 mg/kg Pyrene ND 0.100 mg/kg Benzo(a)Anthracene ND 0.100 mg/kg Chrysene ND 0.100 mg/kg Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(k)fluoranthene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Benzo(a,h)anthracene ND 0.100 mg/kg Dibenzo(a,h)anthracene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,p)yrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg <	Phenanthrene	ND	0.100	mg∕kg
Fyrene ND 0.100 mg/kg Benzo(a)Anthracene ND 0.100 mg/kg Chrysene ND 0.100 mg/kg Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(k)fluoranthene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Dibenzo(a,h)anthracene ND 0.100 mg/kg Indeno(1,2,3-cd)pyrene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a, pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg	Anthracene	ND	0.100	mg∕kg
Benzo(a)AnthraceneND0.100mg/kgChryseneND0.100mg/kgBenzo(b)fluorantheneND0.100mg/kgBenzo(k)fluorantheneND0.100mg/kgBenzo(a)pyreneND0.100mg/kgDibenzo(a,h)anthraceneND0.100mg/kgIndeno(1,2,3-cd)pyreneND0.100mg/kgBenzo(ghi)peryleneND0.100mg/kgBenzo(j)fluorantheneND0.100mg/kgDibenz(a,h)acridineND0.100mg/kgDibenz(a,j)acridineND0.100mg/kgDibenz(a,e)pyreneND0.100mg/kgDibenz(a,h)pyreneND0.100mg/kgDibenz(a,h)pyreneND0.100mg/kgDibenz(a,h)pyreneND0.100mg/kgDibenz(a,h)pyreneND0.100mg/kgDibenz(a,i)pyreneND0.100mg/kgDibenz(a,i)pyreneND0.100mg/kg	Fluoranthene	ND	0.100	mg∕kg
Chrysene ND 0.100 mg/kg Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(k)fluoranthene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Dibenzo(a,h)anthracene ND 0.100 mg/kg Indeno(1,2,3-cd)pyrene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,e)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,i)pyrene ND 0.100 mg/kg Dibenz(a,i)pyrene ND 0.100 mg/kg	Fyrene	ND	0.100	mg∕kg
Benzo(b)fluoranthene ND 0.100 mg/kg Benzo(k)fluoranthene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Dibenzo(a,h)anthracene ND 0.100 mg/kg Indeno(1,2,3-cd)pyrene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,e)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,i)pyrene ND 0.100 mg/kg	Benzo(a)Anthracene	ND	0.100	mg∕kg
Benzo(k)fluoranthene ND 0.100 mg/kg Benzo(a)pyrene ND 0.100 mg/kg Dibenzo(a,h)anthracene ND 0.100 mg/kg Indeno(1,2,3-cd)pyrene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg	Chrysene	ND	0.100	mg∕kg
Benzo(a)pyrene ND 0.100 mg/kg Dibenzo(a,h)anthracene ND 0.100 mg/kg Indeno(1,2,3-cd)pyrene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a, p)pyrene ND 0.100 mg/kg Dibenz(a, h)pyrene ND 0.100 mg/kg Dibenz(a, h)pyrene ND 0.100 mg/kg Dibenz(a, h)pyrene ND 0.100 mg/kg	Benzo(b)fluoranthene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene ND 0.100 mg/kg Indeno(1,2,3-cd)pyrene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,e)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg	Benzo(k)fluoranthene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene ND 0.100 mg/kg Benzo(ghi)perylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,e)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,i)pyrene ND 0.100 mg/kg	Benzo(a)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene ND 0.100 mg/kg Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,e)pyrene ND 0.100 mg/kg Dibenz(a,e)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg	Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Benzo(j)fluoranthene ND 0.100 mg/kg Dibenz(a,h)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,j)acridine ND 0.100 mg/kg Dibenz(a,e)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,h)pyrene ND 0.100 mg/kg Dibenz(a,i)pyrene ND 0.100 mg/kg	Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)acridineND0.100mg/kgDibenz(a,j)acridineND0.100mg/kgDibenz(a,e)pyreneND0.100mg/kgDibenz(a,h)pyreneND0.100mg/kgDibenz(a,i)pyreneND0.100mg/kg	Benzo(ghi)perylene	ND	0.100	mg∕kg
Dibenz(a,j)acridineND0.100mg/kgDibenz(a,e)pyreneND0.100mg/kgDibenz(a,h)pyreneND0.100mg/kgDibenz(a,i)pyreneND0.100mg/kg	Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,e)pyreneND0.100 mg/kgDibenz(a,h)pyreneND0.100 mg/kgDibenz(a,i)pyreneND0.100 mg/kg	Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,h)pyreneND0.100mg/kgDibenz(a,i)pyreneND0.100mg/kg	Dibenz(a,j)acridine	ND	0.100	mg/kg
Dibenz(a,i)pyrene ND 0.100 mg/kg	Dibenz(a,e)pyrene	ND	0.100	mg∕kg
	Dibenz(a,h)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene ND 0.100 mg/kg	Dibenz(a,i)pyrene	ND	0.100	mg∕kg
	3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample 1D: T-4 West			Date	Sampled:	06/13/89
Laboratory Number:	C89032		Date	Received:	06/19/89
Analysis Requested:	8100		Date	Extracted:	06/26/89
Sample Matrix:	Soil		Date	Analyzed:	07/17/89
Preservative:	None				
Condition:	Cool				
				Det.	
Parameter		Concentration		Limit	Units
after find tot - ange and first when the same					
Naphthalene		ND		0.180	mg/kg

Naphthalene	NE)	0.18 0	mg∕kg
Acenaphthalene	ND	0.230	mq/kq
Acenaphthene	ND	0.180	mq∕kq
Fluorene	ND	0.100	ma∕ka
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	ma/ka
Fluoranthene	ND	0.100	ma∕ka
Fyrene	ND	0.100	mq/kq
Benzo(a)Anthracene	ND	0.100	ma∕ka
Chrysene	ND	0.100	mą∕ką
Benzo(b)fluoranthene	ND	0.100	mg/kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mq∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg/kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Jack Morgan, Organic Chemist



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Analysis Requested: 8 Sample Matrix: S Preservative: N	289033 3100 3oil None 2ool		Date F Date E	Sampled: Seceived: Extracted: Smalyzed:	06/13/89 06/19/89 06/27/89 07/14/89
Parameter		Concentration		Det. Limit	Units
Naphthalene Acenaphthalene Acenaphthalene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)Anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)fluoranthene Benzo(a)pyrene Dibenzo(a,h)anthracen Indeno(1,2,3-cd)pyren Benzo(ghi)perylene Benzo(j)fluoranthene Dibenz(a,h)acridine Dibenz(a,j)acridine Dibenz(a,e)pyrene Dibenz(a,h)pyrene Dibenz(a,i)pyrene 3-Methylcholanthrene		ND ND ND ND ND ND ND ND ND ND ND ND ND N		$\begin{array}{c} 0.180\\ 0.230\\ 0.180\\ 0.100\\ 0.00\\ $	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

věd by Jack Morgan, Organic Chemist Re



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: Pit North 06/13/89 Date Sampled: Laboratory Number: C89034 Date Received: 06/19/89 Analysis Requested: 8100 Date Extracted: 06/27/89 07/17/89 Sample Matrix: Soil Date Analyzed: None Preservative: Condition: Cool

Farameter	Concentration	Limit	Units
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	• . 230	mg∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg/kg
Fhenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	0.178	0.100	mg∕kg
Fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	0.118	0.100	mg/kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

iewed by Jack Morgan, Organic Chemist



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: Pit Sout Laboratory Number: Analysis Requested: Sample Matrix: Freservative: Condition:	C89035		Date Date	Sampled: Received: Extracted: Analyzed:	06/13/89 06/15/89 06/27/89 07/14/89
1 997, 1				Det.	
Parameter		Concentration		Limit	Units
					10000
Naphthalene		ND		0.180	mg∕kg
Acenaphthalene		ND		0.230	mg/kg
Acenaphthene		ND		0.180	mq∕kg
Fluorene		ND		0.100	mq∕kg
Phenanthrene		ND		0.100	mg/kg
Anthracene		ND		0.100	mą∕ką
Fluoranthene		ND		0.100	mq∕kg
Fyrene		ND		0.100	mq∕kq

r i uur aurunene	ND/	O TOO	mq/Kg
Pyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

ewed by Jack Morgan, Organic Chemist



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: Pit East		Date	Sampled:	06/13/89
Laboratory Number:	C89036	Date	Received:	06/19/89
Analysis Requested:	8100	Date	Extracted:	06/27/89
Sample Matrix:	Soil	Date	Analyzed:	07/14/89
Preservative:	None			
Condition:	Cool			
			Det.	

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	0.230	mg∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Jack Morgan, Organic Chemist



06/13/89

Report Date: 08/02/89

Date Received: 06/19/89 Date Extracted: 06/27/89 Date Analyzed: 07/14/89

Date Sampled:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: F	^o it West	
Laboratory M	lumber:	C89037
Analysis Rec	quested:	8100
Sample Matri	. X I	Soil
Preservative		None
Condition:		Cool

Farameter	Concentration	Limit	Unite
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	0.230	mg/kg mg/kg
Acenaphthene	ND	0.180	
Fluorene	ND		mg∕kg
Fhenanthrene	ND	0.100	mg∕kg
Anthracene		0.100	mg∕kg
	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Pyrene F	ND	0.100	mg/kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	ma∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg/kq
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg/kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Rey iewed by Jack Morgan, Organic Chemist

inter-Mountain		College Station, Te	3, Box 256 exas 77840 9) 776-8945
Laboratories, Inc.		Report Date:	08/02/89
Client: K.W.BROWN AND AS	SOCIATES		
Sample ID: T-6 East Laboratory Number: C89038 Analysis Requested: 8100 Sample Matrix: Soil Preservative: None Condition: Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/19/89 06/23/89 06/26/89
		Det.	
Parameter	Concentration	Limit	Units
Naphthalene Acenaphthalene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)Anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)fluoranthene Benzo(a)pyrene Dibenzo(a,h)anthracene Indeno(1,2,3-cd)pyrene Benzo(ghi)perylene Benzo(j)fluoranthene Dibenz(a,h)acridine Dibenz(a,j)acridine	ND ND ND ND ND ND ND ND ND ND ND ND ND N	0.180 0.230 0.100 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg g/kg
Dibenz(a,e)pyrene Dibenz(a,h)pyrene Dibenz(a,i)pyrene	ND ND	0.100 0.100	mg∕kg mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-6 East	DUPLICATE	Date	Sampled:	06/15/89
Laboratory Number:	C89045	Date	Received:	06/19/89
Analysis Requested:	8100	Date	Extracted:	06/23/89
Sample Matrix:	Soil	Date	Analyzed:	06/26/89
Preservative:	None			
Condition:	Cool			

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.180	 mg∕kg
Acenaphthalene	ND	0.230	
Acenaphthene	ND	0.180	mg∕kg mg/kg
Fluorene	ND		mg∕kg
		0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Fyrene	ND	0.100	ma∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz (a, e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg/kg
3-Methylcholanthrene	ND	0.100	mg/kg mg/kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



06/15/89

06/19/89

Report Date: 08/02/89

Date Extracted: 06/30/89 Date Analyzed: 07/28/89

Date Sampled:

Date Received:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID	: T-6 West	
Laboratory	y Number:	C89039
Analysis H	Requested:	8100
Sample Mat	trix:	Soil
Preservat:	i∨e:	None
Condition	ki Sr	Cool

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.18 0	mg/ka
Acenaphthalene	ND	0.230	mq∕kq
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg/kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	ma∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Jack Morgan, Organic Chemist



06/15/89

Report Date: 08/02/89

Date Received: 06/19/89 Date Extracted: 06/30/89 Date Analyzed: 07/28/89

Date Sampled:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample	ID:	T-7	
Laborat	ory	Number:	C89040
Analysi	s Re	quested:	8100
Sample	Matr	i×:	Soil
Preserv	ativ	/e:	None
Conditi	on:		Cool

Farameter	Concentration	Limit	Units
		0001, 0001, and a same second	
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	0,230	mg∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	Ŏ.1OŎ	mg∕kg
Fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mą∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	O.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg/kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: RP1-A		Date	Sampled:	06/15/89
Laboratory Number:	C89041	Date	Received:	06/19/89
Analysis Requested:	8100	Date	Extracted:	06/27/89
Sample Matrix:	Soil	Date	Analyzed:	07/14/89
Preservative:	None			
Condition:	Cool			

Parameter	Concentration	Det. Limit	Units
Naphthalene		0.180	 mg∕kg
Acenaphthalene	ND	0.230	mg∕kg
Acenaphthene	NP	0.180	mg∕kg mg∕kg
Fluorene	ND	0.100	mg/kg
Phenanthrene	ND	0.100	mg/kg
Anthracene	ND	0.100	mg/kg
Fluoranthene	NB	0.100	mg/kg
Pyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	NĐ	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	ma/ka
Benzo(a)pyrene	NĐ	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mq∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg/kg
Benzo(j)fluoranthene	ND	0.100	na∕ka
Dibenz(a,h)acridine	ND	0.100	mg/kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz (a, e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0,100	mg∕kg

Method:

: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



06/15/89

06/19/89

Report Date: 08/02/89

Date Extracted: 06/27/89 Date Analyzed: 07/14/89

Date Sampled:

Date Received:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID:	RP1-B	
Laboratory	Number:	C89042
Analysis Re	quested:	8100
Sample Matr	i × F	Soil
Preservativ	·e::	None
Condition:		Cool

Parameter	Concentration	Limit	Units
			······································
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	0.230	mą∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	O.100	mg∕kg
Phenanthrene	ND	Ö.100	mg∕kg
Anthracene	ND	0.100	mg/kg
Fluoranthene	ND	0.100	mg∕kg
Fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg/kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg/kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg/kg
Dibenz(a,i)pyrene	ND	0.100	mg/kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: RP1-B	DUPLICATE	Date	Sampled:	06/15/89
Laboratory Number:	C89049	Date	Received:	06/19/89
Analysis Requested:	8100	Date	Extracted:	06/30/89
Sample Matrix:	Soil	Date	Analyzed:	07/31/89
Preservative:	None			
Condition:	Cool			
			Det.	

Farameter	Concentration	Limit	Units
Naphthalene	ND	0.180	ma/kg
Acenaphthalene	ND	0.230	mg∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Fyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	mg/kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg/kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

ewed by Jack Morgan, Organic Chemist Revi



06/15/89

Report Date: 08/02/89

Date Received: 06/19/89

Date Extracted: 06/30/89

Date Analyzed: 07/14/89

Date Sampled:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: RP-2 Laboratory Number: C89043 Analysis Requested: 8100 Sample Matrix: Soil Preservative: None Condition: Cool

Farameter	Concentration	Limit	Units
which wants which apply stars and the stars	and a state watch watch when when again state when when you wante state		
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	0.230	mg∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Pyrene	ND	0.100	mg∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	O.100	mg∕ka
Benzo(k)fluoranthene	ND	0.100	mg∕kg
Benzo(a)pyrene	ND	0.100	ma∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: RP-2	DUPLICAT	9694 917	Date	Sampled:	06/15/89
Laboratory Number:	C89050		Date	Received:	06/19/89
Analysis Requested:	8100		Date	Extracted:	06/30/89
Sample Matri×:	Soil		Date	Analyzed:	07/28/89
Preservative:	None				
Condition:	Cool				
				Det.	
		Commenter		i i mii t	llesi de ce

Parameter	Concentration	Limit	Units
		······	
Naphthalene	ND	0.180	mg∕kg
Acenaphthalene	ND	0.230	mg∕kg
Acenaphthene	ND	0.180	mg∕kg
Fluorene	ND	0.100	mg∕kg
Phenanthrene	ND	0.100	mg∕kg
Anthracene	ND	0.100	mg∕kg
Fluoranthene	ND	0.100	mg∕kg
Pyrene	ND	0.100	mą∕kg
Benzo(a)Anthracene	ND	0.100	mg∕kg
Chrysene	ND	0.100	mg∕kg
Benzo(b)fluoranthene	ND	0.100	mg∕kg
Benzo(k)fluoranthene	ND	0.100	mg/kg
Benzo(a)pyrene	ND	0.100	mg∕kg
Dibenzo(a,h)anthracene	ND	0.100	mg∕kg
Indeno(1,2,3-cd)pyrene	ND	0.100	mg∕kg
Benzo(ghi)perylene	ND	0.100	mg∕kg
Benzo(j)fluoranthene	ND	0.100	mg∕kg
Dibenz(a,h)acridine	ND	0.100	mg∕kg
Dibenz(a,j)acridine	ND	0.100	mg∕kg
Dibenz(a,e)pyrene	ND	0.100	mg∕kg
Dibenz(a,h)pyrene	ND	0.100	mg∕kg
Dibenz(a,i)pyrene	ND	0.100	mg∕kg
3-Methylcholanthrene	ND	0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES Sample ID: BG-1 Date Sampled:

Sample ID: BG-1 Laboratory Number: Analysis Requested: Sample Matrix: Freservative: Condition:	C89044 8100 Soil None Cool		Date R Date E	Sampled: Seceived: Sxtracted: Smalyzed:	06/15/89 06/19/89 06/30/89 07/14/89
CONCI CI CH:				Det.	
Parameter		Concentration		Limit	Units
alaala aana ayar ahaa ahaa ahaa ahaa aana aayaa aaba				and a second sector strain and	
Naphthalene		ND		0.180	mg∕kg
Acenaphthalene		ND		0.230	mg∕kg
Acenaphthene		ND		0.180	mg∕kg
Fluorene		ND		0.100	mg∕kg
Fhenanthrene		ND		0.100	mg∕kg
Anthracene		ND		0.100	mg∕kg
Fluoranthene		ND		0.100	mg∕kg
Fyrene		ND		0.100	mg∕kg
Benzo(a)Anthracene		ND .		0.100	mg∕kg
Chrysene		ND		0.100	mą∕kg
Benzo(b)fluoranthen		ND		0.100	mg∕kg
Benzo(k)fluoranthen	e	ND		0.100	mg∕kg
Benzo(a)pyrene		ND		0.100	mg∕kg
Dibenzo(a,h)anthrac	ene	ND		0.100	mg∕kg
Indeno $(1, 2, 3-cd)$ pyr	ene	ND		0.100	mg∕kg
Benzo(ghi)perylene		ND		0.100	mg∕kg
Benzo(j)fluoranthen	e	ND		0.100	mg∕kg
Dibenz(a,h)acrídine		ND		0.100	mg∕kg
Dibenz(a,j)acridine		ND		0.100	mg∕kg
Dibenz(a,e)pyrene		ND		0.100	mg∕kg
Dibenz(a,h)pyrene		ND		0.100	mg∕kg
Dibenz(a,i)pyrene		ND		0.100	mg∕kg
3-Methylcholanthren	e	ND		0.100	mg∕kg

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEFA, (Sept. 1986).

ND - Farameter not detected at the stated detection limit.

Comments:

GLYCOLS (Soil)

(Soil)

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Report Date: 07/19/89 _

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Client: KW Brown	and Assoc	iates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T1-East C89021 Glycols Soil None Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/19/89 06/30/89
Parameter		Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol		ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brow	n and Associates		
Sample ID: Laboratory Number: Analysis Requested Sample Matrix: Preservative: Condition:	T1-Center C89022 : Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/19/89 06/30/89
Parameter	Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol	ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Asso	ciates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	T1-West C89023 Glycols Soil None		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/19/89 06/30/89
Condition:	Cool			
			Det.	
Farameter		Concentration	Limit	Units
Ethylene Glycol Diethylene Glycol		ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by



mg/kg

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Report Date: 07/19/89

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Client: KW Brown and Associates T2-East Date Sampled: 06/12/89 Sample ID: Date Received: 06/16/89 Laboratory Number: C89024 Date Extracted: 06/19/89 Analysis Requested: Glycols Date Analyzed: 06/30/89 Sample Matrix: Soil Freservative: None Condition: Cool Det. Parameter Concentration Limit Unite ----------Ethylene Glycol ND 5.0 mg/kg

ND.

Diethvlene Glycol

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T2-Center C89025 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/19/89 06/30/89
Parameter	Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol	ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by


		Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T2-West C89026 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/19/89 06/30/89
Parameter Ethylene Glycol Diethylene Glycol	Concentration ND ND	Det. Limit 5.0 5.0	Units mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T3-East C89027 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/19/89 06/30/89
Parameter	Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol	ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



		Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T3-Center C89028 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/19/89 06/30/89
Parameter Ethylene Glycol	Concentration ND	Det. Limit 5.0	Units mg/kg
Diethylene Glycol	ND	5.0	mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID:	T3-West	Date Sampled:	06/12/89
Laboratory Number:	C89029	Date Received:	06/16/89
Analysis Requested:	Glycole	Date Extracted:	06/19/89
Sample Matrix:	Soil	Date Analyzed:	06/30/89
Preservative:	None		
Condition:	Cool		
		Det.	·
Parameter	Concentration	Limit	Units
Ethylene Glycol	ND	5.0	mg/kg
Diethylene Glycol	ND	5.0	ma/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID:	T4-East	Date Sampled:	06/13/89
Laboratory Number:	C89030	Date Received:	06/16/89
Analysis Requested:	Glycols	Date Extracted:	06/19/89
Sample Matrix:	Soil	Date Analyzed:	06/30/89
Freservative:	None		
Condition:	Cool		
		Det.	
Parameter	Concentration	Limit	Units
	والمراجع والمراجع والمراجع والمراجع والمراجع المراجع المراجع المراجع المراجع والمراجع والمراجع والمراجع والمراجع		
Ethylene Glycol	ND	5.0	mg∕kg
Diethylene Glycol	ND	5.0	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



mg/kg

Report Date: 07/19/89

5.0

Client: KW Brow	n and Associates		
Sample ID: Laboratory Number: Analysis Requested Sample Matrix: Preservative: Condition:	T4-Center C89031 : Glycols Soil None Cool	Date Received: Date Extracted:	06/13/89 06/16/89 06/19/89 06/30/89
Parameter Ethylene Glycol	Concentration ND	Det. Limit 5.0	Units mg/kg

ND

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Jack M. Morgan Organic Analyst

Diethylene Glycol



mg/kg

Report Date: 07/19/89

5.0

Client: KW Brown and Associates Sample ID: T4-West Date Sampled: 06/13/89 Laboratory Number: C89032 Date Received: 06/16/89 Analysis Requested: Glycols Date Extracted: 06/19/89 Sample Matrix: Soil Date Analyzed: 06/30/89 Preservative: None Condition: Cool Det. Parameter Concentration Limit Units ----Ethylene Glycol 5.0 ND mg/kg

ND

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by

Jack M. Morgan -Organic Analyst

Diethylene Glycol



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		Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T5 C89033 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/21/89 06/30/89
Parameter	Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol	ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID:	Pit North	Date Sampled:	06/13/89
Laboratory Number:	C89034	Date Received:	06/16/89
Analysis Requested:	51 ycols	Date Extracted:	06/21/89
Sample Matrix:	Soil	Date Analyzed:	06/30/89
Preservative:	None		
Condition:	Cool		
		Det.	
Parameter	Concentration	Limit	Units
Ethylene Glycol	ND	5.0	mg/kg
Diethylene Glycol	ND	5.0	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



		Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	Pit South C89035 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/21/89 06/30/89
Parameter Ethylene Glycol Diethylene Glycol	Concentration ND ND	Det. Limit 5.0 5.0	Units mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by



Report Date: 07/19/89

Client: KW Brown	n and Associates		
Sample ID: Laboratory Number: Analysis Requested Sample Matrix: Preservative: Condition:	Pit East C89036 : Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/21/89 06/30/89
Parameter	Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol	ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by



		Report Date:	07/19/89
Client: KW Brown	and Associates	•	
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	Pit West C89037 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/21/89 06/30/89
Parameter	Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol	ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by



Report Date: 07/19/89

Client: KW Brown and Associates Sample ID: T6-East Date Sampled: 06/15/89 Date Received: Laboratory Number: 089038 06/16/89 Analysis Requested: Glycols Date Extracted: 06/19/89 Sample Matrix: Soil Date Analyzed: 06/30/89 Freservative: None Condition: Cool Det. Parameter Concentration Limit Units _____ -----_____ Ethylene Glycol ND 5.0 mg∕kg Diethylene Glycol ND 5.0 mq∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



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Report Date: 07/19/89 Client: KW Brown and Associates Sample ID: T6-West Date Sampled: 06/15/89 Laboratory Number: C89039 Date Received: 06/16/89 Analysis Requested: Glycols Date Extracted: 06/21/89 Date Analyzed: Sample Matrix: Soil 06/30/89 Preservative: None Condition: Cool

Parameter	Concentration	Det. Limit	Units
	والمرابع مرابق المرابع		
Ethylene Glycol	ND	5.0	mg∕kg
Diethylene Glycol	ND	5.O	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



		Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Freservative: Condition:	T7 C89040 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/21/89 06/30/89
Parameter Ethylene Glycol Diethylene Glycol	Concentration ND ND	Det. Limit 5.0 5.0	Units mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Client: KW Brown	and Asso	Dciates	Seport Date:	07/19/89
Sample JD: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	RP1-A C89041 Glycols Soil None Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/21/89 06/30/89
Parameter		Concentration	Det. Limit	
Ethylene Glycol		 ND		Units
Diethylene Glycol		ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Re∨iewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	RF1-B C89042 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/21/89 07/06/89
Parameter Ethylene Glycol Diethylene Glycol	Concentration ND ND	Det. Limit 5.0 5.0	Units mg/kg mg/kg

ND - Farameter not detected at the stated detection limit.

Comments:

Reviewed by



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Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID:	RP2	Date Sampled:	06/15/89
Laboratory Number:	C89043	Date Received:	06/16/89
Analysis Requested:	Glycols	Date Extracted:	06/21/89
Sample Matrix:	Soil	Date Analyzed:	07/06/89
Preservative:	None		
Condition:	Cool		
		Det.	
Parameter	Concentration	Limit	Units
Print aller aller aller aller and average average states. States			
Ethylene Glycol	ND	5.0	mg∕kg
Diethylene Glycol	ND	5.0	ma∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by



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Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	BG-1 C89044 Glycols Soil None	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/21/89 07/06/89
Condition:	Cool		
Parameter	Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol	ND ND	5.0 5.0	mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



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** QUALITY ASSURANCE FIELD DUPLICATE	E REPORT	Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T6-East C89045 Glycols Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/19/89 06/30/89
Parameter Ethylene Glycol Diethylene Glycol	Concentration ND ND	Det. Limit 5.0 5.0	Units mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Inter-Mountain Laboratories, Inc.		Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945			
** QUALITY ASSURANCE FIELD DUPLICATE	E REPORT		Report Date:	07/19/89	
Client: KW Brown	and Assoc	ziates			
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T7 C89047 Glycols Soil None Ccol		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/21/89	
Parameter		Concentration	Det. Limit	Units	
Ethylene Glycol Diethylene Glycol		ND ND	5.0 5.0	mg∕kg mg∕kg	

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by

Inter-Mountain Laboratories, Inc.			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
** QUALITY ASSURANCE FIELD DUPLICATE	E REPORT		Report Date:	07/19/89	
Client: KW Brown	and Asso	ziates			
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	RP1-A C89048 Glycols Soil None Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/19/89 06/30/89	
Parameter		Concentration	Det. Limit	Units	
Ethylene Glycol Diethylene Glycol		ND ND	5.0 5.0	mg∕kg mg∕kg	

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ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by



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** QUALITY ASSURANC FIELD DUPLICATE	E REPORT	Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	RF1-B C89049 Glycols Soil None Cool	Date Analyzed:	06/15/89 06/16/89 06/21/89 07/06/89
Parameter Ethylene Glycol Diethylene Glycol	Concentration ND ND	Det. Limit 5.0 5.0	Units mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Inter-Mountain Laboratories, Inc.		Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
** QUALITY ASSURANC FIELD DUPLICATE	E REPORT		Report Date:	07/19/89
Client: KW Brown	and Asso	ciates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:			Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/16/89 06/21/89
Parameter		Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol		ND ND	5.0 5.0	 mg∕kg mg∕kg

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ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by

Inter-Mountain Laboratories, Inc.			Route 3, Box 2: College Station, Texas 778 Tel. (409) 776-89		
** QUALITY ASSURANCE MATRIX SPIKE	E REPORT		Report Date:	07/19/89	
Client: KW Brown	and Associa	tes			
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Freservative: Condition:	73-Weast C89027 Glycols Soil None Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:		
Parameter	Spike Added	Sample Result	Spiked Sample Result	Percent Recovery	

ND

ND

161

ND

54

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ND - Parameter not detected at the stated detection limit.

300

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Comments: All concentrations in mg/kg.

Reviewed by

Jack M. Morgan Organic Analyst

Ethylene Glycol

Diethylene Glycol

inter-Mountain Laboratories, Inc.			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
** QUALITY ASSURANC MATRIX SPIKE	E REPORT		Report Date:	07/19/89	
Client: KW Brown	and Associa	tes			
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T7 C89047 Glycols Soil None Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/21/89	
Parameter	Spike	Sample	Spiked Sample	Percent	

rar ameter	SPIKE	sampie	spiked sample	rercenc
	Added	Result	Result	Recovery
Ethylene Glycol	300	ND	243	81
Diethylene Glycol	Ō	ND	ND	

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in mg/kg.

Reviewed by

CHLORINATED HYDROCARBONS (Soil)

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2-Chloronapthalene

Hexachlorobenzene

Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945

Report Date: 08/02/89

0.89

0.05

mq/kq

ma/kg

Client: K.W.BROWN AND ASSOCIATES Sample ID: T-1 East Date Sampled: 06/12/89 Laboratory Number: C89021 Date Received: 06/16/89 Analysis Requested: 8120 Date Extracted: 06/23/89 07/24/89 Sample Matrix: Soil Date Analyzed: Freservative: None Condition: Cool Det. Farameter Concentration Limit Units ----------1.3-Dichlorobenzene 2.4 mg∕ka ND 1,4-Dichlorobenzene ND 2.4 ma/ka 1.2-Dichlorobenzene ND 1.08 mg/kg 0.70 Hexachlorobutadiene ND mq/kq 1.2.4-Trichlorobenzene 0.05 MD mq/kq Hexachlorocyclopentadiene ND 0.70 mq/kq

Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

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Reviewed by Lid Mayfield

Inter-Mountain			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.			Repor	t Date:	08/02/89
Client: K.W.BROW	IN AND ASS	OCIATES			
Sample ID: T-1 Cent	er		Date	Sampled:	06/12/89
Laboratory Number:	C89022		Date	Received:	06/16/89
Analysis Requested:	8120			Extracted:	
Sample Matrix:	Soil		Date	Analyzed:	07/24/89
Preservative:	None				
Condition:	Cool				
				Det.	
Farameter		Concentration		Limit	Units
1,3-Dichlorobenzene	2	ND		2.4	mg∕kg
1,4-Dichlorobenzene	<u>e</u>	ND		2.4	mg∕kg
1.2-Dichlorobenzene		ND		1.08	mg∕kg
Hexachlorobutadiene	<u>p</u>	ND		0.70	mg∕kg
1,2,4-Trichlorobenz	ene	ND		0,05	mg∕kg
Hexachlorocyclopent	adiene	ND		0,70	mg∕kg
2-Chloronapthalene		ND		0.89	mg∕kg
Hexachlorobenzene		ND		0.05	mg∕kg

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Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

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L Reviewed by \mathcal{W} sa Mayfield

Inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.	Report Date:	08/02/89	
Client: K.W.BROWN AND A	SSOCIATES		
Sample ID: T-1 West		Date Sampled:	06/12/89
Laboratory Number: C89023		Date Received:	06/16/89
Analysis Requested: 8120		Date Extracted:	06/23/89
Sample Matrix: Soil		Date Analyzed:	08/02/89
Preservative: None			
Condition: Cool			
		Det.	
Parameter	Concentration	Limit	Units
1,3-Dichlorobenzene	ND	2.4	mg∕kg
1,4-Dichlorobenzene	ND	2.4	mg∕kg
1,2-Dichlorobenzene	ND	1.08	mg∕kg
Hexachlorobutadiene	ND	0.70	mg/kg
1,2,4-Trichlorobenzene	ND	0.05	mg∕kg
Hexachlorocyclopentadiene	ND	0.70	mg∕kg
2-Chloronapthalene	ND	o . 89	mg∕kg
Hexachlorobenzene	ND	0.05	mg/kg

Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

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Liss Mayfield Reviewed by Usa Mayfield

inter-Mountain Laboratories, Inc.			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
			Report Date	: 08/02/89	
Client: K.W.BROW	N AND AS	SOCIATES			
Sample ID: T-2 East			Date Sample		
Laboratory Number:	C89024			ed: 06/16/89 ted: 06/23/89	
Analysis Requested: Sample Matrix:	Soil		Date Analyz		
Preservative:	None		Date milarys		
Condition:	Cool				
			Det.		
Parameter		Concentration	Limi		
1,3-Dichlorobenzene		ND	2.4		
1,4-Dichlorobenzene		ND	2,4		
1,2-Dichlorobenzene		ND	1.08		
Hexachlorobutadiene		ND	0.70	mg∕kg	
1,2,4-Trichlorobenz	ene	ND	0.05	mg∕kg	
Hexachlorocyclopent	adiene	ND	0.70	mg∕kg	
2-Chloronapthalene		ND	0.89	~ ~	
Hexachlorobenzene		ND	0.05	ma∕kg	

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Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa Mayfield Reviewed by Usa Mayfield

inter-Mountain			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.		Report	: Date:	08/02/89	
Client: K.W.I	BROWN AND AS	SOCIATES			
Sample ID: T-2 (Center		Date S	Sampled:	06/12/89
Laboratory Numbe				Received:	06/16/89
Analysis Requested: 8120				Extracted:	
Sample Matrix:	Soil		Date 4	Analyzed:	08/02/89
Preservative:	None				
Condition:	Cool			to an de	
Parameter		Concentration		Det. Limit	Units
1,3-Dichloroben:	rene	ND		2.4	mg∕kg
1,4-Dichloroben:	zene	ND		2.4	mą∕kg
1,2-Dichlorobenzene		ND		1.08	mg∕kg
Hexachlorobutadiene		ND		0.70	mg∕kg
1,2,4-Trichlorobenzene		ND		0.05	mg∕kg
Hexachlorocyclo		ND		0.70	mg∕kg
2-Chloronapthal		ND		0.89	mg∕kg
Hexachlorobenzene		ND		0.05	mą∕kg

Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by Liles Mayfield

Inter-Mountain Laboratories, Inc.		Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
		Repor	-t Date:	08/02/89
Client: K.W.BROW	AND ASSOCIATE	9		
Sample ID: T-2 West Laboratory Number: Analysis Requested: Sample Matrix:	C87026 8120 Scil	Date Date	Sampled: Received: Extracted: Analyzed:	06/12/89 06/16/89 06/23/89 08/02/89
Preservative: Condition:	None Cool		r) – k	
Parameter	Conce	ntration	Det. Limit	Units
1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Hexachlorobutadiene 1,2,4-Trichlorobenze Hexachlorocyclopent 2-Chloronapthalene Hexachlorobenzene			2.4 2.4 1.08 0.70 0.05 0.70 0.89 0.05	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg

Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by Libe Mayfield

inter-Mountain			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.		Repor	t Date:	08/02/89	
Client: K.W.BROW	N AND ASS	OCIATES			
Sample ID: T-3 East				-	06/12/89
Laboratory Number:	C89027			Received:	
	8120			Extracted:	
Sample Matrix:	Soil		Date	Analyzed:	07/24/89
Preservative:	None				
Cendition:	Cool			7 5	
Parameter		Concentration		Det. Limit	Units
1,3-Dichlorobenzene		ND		2.4	mg∕kg
1,4-Dichlorobenzene		ND		2.4	mg∕kg
1,2-Dichlorobenzene		ND		1.08	mg∕kg
Hexachlorobutadiene		ND		0,70	mg∕kg
1,2,4-Trichlorobenz		ND		0.05	mg∕kg
Hexachlorocyclopent	adiene	ND		0.70	mg∕kg
2-Chloronapthalene		ND		0.89	mg∕kg
Hexachlorobenzene		ND		0.05	mg∕kg

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Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa Mayfield Reviewed by Libsa Mayfield

inter-Mountain				College Station, Te	Route 3, Box 256 ege Station, Texas 77840 Tel. (409) 776-8945	
Laboratories, Inc.			Repor	t Date:	08/02/89	
Client: K.W.BR	OWN AND ASS	SOCIATES				
Sample ID: T-3 Ce	nter		Date	Sampled:	06/13/89	
Laboratory Number:	: C89028			Received:	06/16/89	
Analysis Requested	d: 8120		Date	Extracted:	06/23/89	
Sample Matrix:	Soil		Date	Analyzed:	07/24/89	
Preservative:	None					
Condition:	Cool					
				Det.		
Parameter		Concentration		Limit	Units	
1,3-Dichlorobenzer	ne	ND		2.4	mg∕kg	
1,4-Dichlorobenzer	пe	ND		2.4	mg/kg	
1,2-Dichlorobenzer	he	ND		1.08	mg∕kg	
Hexachlorobutadie	ЪЕ	ND		0.70	mg∕kg	
1,2,4-Trichlorober		ND		0.05	mg∕kg	
Hexachlorocyclope		ND		0.70	mg∕kg	
2-Chloronapthalen	<u> </u>	ND		0.89	mg∕kg	
Hexachlorobenzene		ND		0.05	mg∕kg	

Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by List Hayfield

inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.	Report Date:	08/02/89	
Client: K.W.BROWN A	ND ASSOCIATES		
Sample ID: T-3 West		Date Sampled:	06/13/89
	9029	Date Received:	06/16/89
Analysis Requested: 81	20	Date Extracted:	06/23/89
Sample Matrix: So	i 1	Date Analyzed:	07/24/89
Preservative: No			
Condition: Co	ol	-	
		Det.	
Parameter	Concentration	Limit	Units
1,3-Dichlorobenzene	NI)	2.4	mg∕kg
1,4-Dichlorobenzene	ND	2.4	mg∕kg
1,2-Dichlorobenzene	ND	1.08	mg∕kg
Hexachlorobutadiene	ND	0.70	mq/kg
1,2,4-Trichlorobenzene	ND	0,05	mg∕kg
Hexachlorocyclopentadi		0.70	mg∕kg
2-Chloronapthalene	ND	0.89	mg∕kg
Hexachlorobenzene	ND	0.05	mg∕kg

Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Liss Mayfield
inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.		Report Date:	08/02/89
Client: K.W.BROWN AN	D ASSOCIATES		
Sample ID: T-4 East		Date Sampled:	
Laboratory Number: C89		Date Received:	
Analysis Requested: 812		Date Extracted:	
Sample Matrix: Soi		Date Analyzed:	07/25/89
Preservative: Non			
Condition: Coo	<u>.</u>	Det.	
Parameter	Concentration	Limit	Units
1,3-Dichlorobenzene	ND	2.4	mg∕kg
1,4-Dichlorobenzene	ND	2.4	mg∕kg
1,2-Dichlorobenzene	ND	1.08	mg∕kg
Hexachlorobutadiene	ND	0.70	mg∕kg
1,2,4-Trichlorobenzene	ND	0.05	mg∕kg
Hexachlorocyclopentadie		0.70	mg∕kg
2-Chloronapthalene	ND	0.89	mg∕kg
Hexachlorobenzene	ND	0.05	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by Lied Mayfield

Inter-Mountain			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Ind	С.		Report Date:	08/02/89	
Client: K	.W.BROWN AND (ASSOCIATES			
Sample ID: T Laboratory N Analysis Rec Sample Matri Preservative Condition:	lumber: C8903. Juested: 8120 X: Soil	1.	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/26/89 07/25/89	
Parameter		Concentration	Det. Limit	Unite	
1,3-Dichlorc 1,4-Dichlorc 1,2-Dichlorc Hexachlorobu 1,2,4-Trichl	benzene benzene tadiene orobenzene clopentadiene halene	ND ND ND ND ND ND ND	2.4 2.4 1.08 0.70 0.05 0.70 0.89 0.05	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	

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Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

hisa Mayfield Reviewed by Lies Mayfield

inter-Mountain		Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945				
Laboratories, Inc.		Report Date:	08/02/89			
Client: K.W.BROWN A	ND ASSOCIATES		l			
Analysis Requested: 81 Sample Matrix: Sc	9032 20 il ne ol	Date Sampled: Date Received: Date Extracted: Date Analyzed:				
Parameter	Concentration	Det. Limit	Units			
1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Hexachlorobutadiene 1,2,4-Trichlorobenzene Hexachlorocyclopentadi 2-Chloronapthalene Hexachlorobenzene		2.4 2.4 1.08 0.70 0.05 0.70 0.89 0.05	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg			

ND - Parameter not detected at the stated detection limit.

hioa Mayfield Reviewed by Was Mayfield

inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.		Report Date: 08/02/8	
Client: K.W.BROWN A	ND ASSOCIATES		
Sample ID: T-5		Date Sampled:	06/13/89
Laboratory Number: CB	19033	Date Received:	06/16/89
Analysis Requested: 81	.20	Date Extracted:	06/29/89
Sample Matrix: Sc)il	Date Analyzed:	07/24/89
	ne		
Condition: Co	pol		
		Det.	
Parameter	Concentration	Limit	Units
1.3-Dichlorobenzene	ND	2.4	mg∕kg
1,4-Dichlorobenzene	ND	2.4	mg∕kg
1,2-Dichlorobenzene	ND	1.08	ma∕kg
Hexachlorobutadiene	ND	0.70	mg∕kg
1,2,4-Trichlorobenzene ND		0.05	mg∕kg
Hexachlorocyclopentadi	ene ND	0.70	mq∕kg
2-Chloronapthalene	ND	0.89	mg∕kg
Hexachlorobenzene	ND	0.05	mq∕kg

ND - Parameter not detected at the stated detection limit.

Lisa Mai Reviewed by MUsa Mayfield

inter-Mountain		College Station, T	3, Box 256 exas 77840 P) 776-8945
Laboratories, Inc.		Report Date:	08/02/89
Client: K.W.BROWN	AND ASSOCIATES		
Analysis Requested: Sample Matrix:	C89034 8120 Soil None	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/29/89 07/25/89
Condition: Parameter	Cool	Det. Limit	Units
1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Hexachlorobutadiene 1,2,4-Trichlorobenze Hexachlorocyclopenta 2-Chloronapthalene Hexachlorobenzene		2.4 2.4 1.08 0.70 0.05 0.70 0.89 0.05	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Reviewed by Wisa Mayfield

Inter-Mountain Laboratories, Inc.			Co	llege Station, Te	3, Box 256 xas 77840) 776-8945
			Report	Date:	08/02/89
Client: K.W.BR	OWN AND AS	SOCIATES			
Sample ID: Pit So	uth		Date Sa	mpled:	06/13/89
Laboratory Number	: C89035		Date Re	ceived:	06/16/89
Analysis Requeste	d: 8120		Date Ex	tracted:	06/29/89
Sample Matrix:	Soil		Date An	alyzed:	07/25/89
Preservative:	None				
Condition:	Cool				
Parameter		Concentration		Det. Limit	Units
1,3-Dichlorobenze	ne	ND		2.4	mg∕kg
1,4-Dichlorobenze	ne	ND		2.4	ma∕kg
1,2-Dichlorobenze	ne	ND		1.08	mg∕kg
Hexachlorobutadiene		ND		0.70	mg∕kg
1,2,4-Trichlorobenzene		ND		0.05	mg∕kg
Hexachlorocyclope		ND		0.70	mg/kg
2-Chloronapthalen		ND		0.89	mg/kg
Hexachlorobenzene		ND		0.05	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

wa May

Reviewed by LUsa Mayfield



ND - Parameter not detected at the stated detection limit.

,isa Mayfield Reviewed by



Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by **⊎**isa Mayfield

inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.		Report Date:	08/02/89
Client: K.W.BROWN AN	D ASSOCIATES		
Sample JD: T-6 East		Date Sampled:	06/15/89
Laboratory Number: C89		Date Received:	
Analysis Requested: 812		Date Extracted	
Sample Matrix: Soi		Date Analyzed:	08/02/89
Preservative: Non			
Condition: Coo	1	••••• r	
Parameter	Concentration	Det. Limit	Units
	adapti bagar mita gaban daan daan asta gaban mita araa, asaa ayaa ayaa asaa mita		
1,3-Dichlorobenzene	ND	2.4	mg∕kg
1,4-Dichlorobenzene	ND	2.4	mg∕kg
1,2-Dichlorobenzene	ND	1.08	mg∕kg
Hexachlorobutadiene	ND	0.70	mg∕kg
1,2,4-Trichlorobenzene	ND	0.05	mg/kg
Hexachlorocyclopentadie		0.70	mg/kg
2-Chloronapthalene	ND	0.89	mg∕kg
Hexachlorobenzene	ND)	0.05	mg∕kg

ND - Parameter not detected at the stated detection limit.

Reviewed by Liva Mayfield



Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945

Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: T-6 West Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89039 8120 Soil None Cool		Date Date	Sampled: Received: Extracted: Analyzed:	04/13/89 06/16/89 06/30/89 07/25/89
				Det.	
Parameter		Concentration		Limít	Units
angada ayalan adalah tanggat kadam pemini. Mangada Malana Permini		faiter sama maay maay aana kana ayaan ayaan ayaan ayaa aayaa kaaya kaaya kaala		attille block sampt salds about	
1,3-Dichlorobenzene		ND		2.4	mg∕kg
1,4-Dichlorobenzene		ND		2.4	mg∕kg
1,2-Dichlorobenzene		ND		1.08	ma∕kg
Hexachlorobutadiene		ND		0.70	mg/kg
1,2,4-Trichlorobenz	ene	ND		0.05	mg/kg
Hexachlorocyclopent.	adiene	ND		0,70	mg/kg
2-Chloronapthalene		ND		0.89	mq∕kq
Hexachlorobenzene		ND		0.05	mg∕kg

Method 8120, Chlorinated Hydrocarbons, SW-846, Method: USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Mais 100

Reviewed by Lie Mayfield



Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945

Report Date: 08/02/89

0.70

0.89

0.05

mg/kg

mg∕kg

mg/kg

Client: K.W.BROWN AND ASSOCIATES

Hexachlorocyclopentadiene

2-Chloronapthalene

Hexachlorobenzene

Sample ID: T-7 Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89040 8120 Soil None Cool		Date Date	Sampled: Received: Extracted: Analyzed:	06/15/89 06/16/89 06/27/89 07/25/89
				Det.	
Parameter		Concentration		Limit	Units
Allan and a serve and a large large calles them with				addige dagan, tanjat k.sta ata.	
1,3-Dichlorobenzene		ND		2.4	mg∕kg
1,4-Dichlorobenzene		ND		2.4	mg/kg
1,2-Dichlorobenzene		ND		1.08	mg∕kg
Hexachlorobutadiene		ND		0.70	mg∕kg
1,2,4-Trichlorobenz	ene	ND		0.05	mg∕kg

ND

ND

ND

Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by Lisk Mayfield

inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945				
Laboratories, Inc.		Report Date:	08/02/89	9	
Client: K.W.BROWN AND	ASSOCIATES				
Sample ID: RP1-A		Date Sampled:	06/15/89		
Laboratory Number: C8904	4 1		06/16/89		
Analysis Requested: 8120		Date Extracted:			
Sample Matrix: Soil		Date Analyzed:	07/25/89		
Preservative: None					
Condition: Cool		Det.			
Parameter	Concentration	Limit	Units		
1,3-Dichlorobenzene	ND	2.4	mg∕kg		
1,4-Dichlorobenzene	ND	2.4	mg∕kg		
1,2-Dichlorobenzene	ND	1.08	mg∕kg		
Hexachlorobutadiene	ND	0.70	mg∕kg		
1,2,4-Trichlorobenzene	ND	0.05	mg∕kg		
Hexachlorocyclopentadiens		0.70	mg∕kg		
2-Chloronapthalene	ND	0.89	mg/kg		
Hexachlorobenzene	ND	0.05	mg/kg		

ND - Parameter not detected at the stated detection limit.

Reviewed by Lise Mayfield

Inter-Mountain	College Station, T	3, Box 256 exas 77840 P) 776-8945	
Laboratories, Inc.		Report Date:	08/02/89
Client: K.W.BROWN	AND ASSOCIATES		
Sample ID: RP1-B Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89042 8120 Soil None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	
Parameter	Concentration	Det. Limit	Unit≘
1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Hexachlorobutadiene 1,2,4-Trichlorobenze Hexachlorocyclopenta 2-Chloronapthalene		2.4 2.4 1.08 0.70 0.05 0.70 0.70 0.87	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg

ND - Parameter not detected at the stated detection limit.

Reviewed by Lita Mayfield

inter-Mountain			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.			Report Date:	08/02/89	
Client: K.W	I.BROWN AND A	SSOCIATES			
Sample ID: RF2	2		Date Sampled:	06/15/89	
Laboratory Num	nber: C89043		Date Received:	06/16/89	
Analvsis Reque			Date Extracted:	06/30/89	
Sample Matrix:	Soil		Date Analyzed:	07/25/89	
Freservative:	None				
Condition:	Cool				
		_	Det.		
Parameter		Concentration	Limit	Units	
1,3-Dichlorobe	nzene	ND	2.4	mg∕kg	
1,4-Dichlorobe	enzene	ND	2.4	mg∕kg	
1,2-Dichlorobe	enzene	ND	1.08	mg∕kg	
Hexachlorobuta	diene	ND	\bigcirc , \bigtriangledown \bigcirc	mq∕kǥ	
1,2,4-Trichlor		ND	0.05	mg∕kg	
Hexachlorocyc]		ND	Ο., 7Ο	mg∕kg	
2-Chloronaptha		ND	0,89	mg∕kg	
Hexachlorobenz	ene	ND	0.05	mg∕kg	

Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Kaa Mayfield Reviewed by Liss Mayfield



ND - Parameter not detected at the stated detection limit.

Mavfield

inter-Mountain		(College Station, Te	3, Box 256 exas 77840) 776-8945	
Laboratories, Inc.			Report	t Date:	08/02/84
Client: K.W.BROWN	AND ASS	DCIATES			
Sample ID: T-6 East	DUPLICAT	444. ••	Date 9	Sampled:	06/15/84
Laboratory Number:	C89045		Date R	Received:	06/16/89
Analysis Requested:	8120		Date A	Extracted:	06/23/89
Sample Matrix:	Soil		Date A	Analyzed:	07/25/89
	None .				
Condition:	Cool				
•••				Det.	
Parameter		Concentration		Limit	Units
1,3-Dichlorobenzene		ND		2.4	mą∕ką
1,4-Dichlorobenzene		ND		2.4	mg∕kg
1,2-Dichlorobenzene		ND		1.08	mg∕kg
Hexachlorobutadiene 1,2,4-Trichlorobenzene		ND		0.70	mg∕kg
		ND		0.05	mg∕kg
Hexachlorocyclopenta	adiene	ND		0.70	mg∕kg
2-Chloronapthalene		ND		0.89	mg∕kg
Hexachlorobenzene		ND		0.05	mg∕kg

ND - Parameter not detected at the stated detection limit.

hisa Mayfield Reviewed by Liles Mayfield



Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Mayfield Reviewed by

Inter-Mounto Laboratories,					College Station, Te	3, Box 256 exas 77840) 776-8945
				Repor	t Date:	08/02/89
Client:	K.W.BROW	N AND AS	SOCIATES			
Sample ID: T-6 West DUPLICAT Laboratory Number: C89046			TE		Sampled: Received:	06/15/89 06/16/89
Analysis R		8120			Extracted:	
Sample Mat	•	Soil			Analyzed:	07/25/89
Preservati		None				
Condition:		Cool				
					Det.	
Farameter		Concentration		Limit	Units	
1,3-Dichlorobenzene		ND		2.4	mg∕kg	
1,4-Dichlo			ND		2.4	mg∕kg
1,2-Dichlorobenzene		ND		1.08	mg∕kg	
Hexachlorobutadiene		ND		0.70	mg∕kg	
1,2,4-Tric			ND		0.05	mg∕kg
Hexachloro		adiene	ND		0.70	mg∕kg
2-Chlorona	pthalene		ND		0.89	mg∕kg

0.05

mg/kg

Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND

ND - Parameter not detected at the stated detection limit.

Comments:

Hexachlorobenzene

1001 Reviewed by Liss Mayfield



Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945

Report Date: 08/02/89

K.W.BROWN AND ASSOCIATES Client: Sample ID: RP1-B SPIKE Date Samoled: 06/15/89 Laboratory Number: C89042 Date Received: 06/16/89 Analysis Requested: 8120 Date Extracted: 06/30/89 Sample Matrix: Date Analyzed: 07/25/89 Soil Preservative: None Condition: Cool Percent Det. Found Parameter Add Limit Units Recovery -------------------1.3-Dichlorobenzene 1429 1351 47% 0.025 ma/ka 1351 1.4-Dichlorobenzene 1429 47% 0.025 ma/ka 1,2-Dichlorobenzene 1429 557 39% 0.025 mg/kg Hexachlorobutadiene 1429 573 40% 0.025 ma∕ka 1,2,4-frichlorobenze1429 434 30% 0.025 mg/kg 2-Chloronapthalene 1429 1205 42% 0.025 mg/kg Hexachlorobenzene 1429 574 40% 0.025 mg∕kg

Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by List Mayfield

VOLATILES (Soil)

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Sample ID:T1-EastDate Sampled:06/12Laboratory Number:C89021Date Received:06/14Analysis Requested:Volatile HalocarbonsDate Extracted:06/24Sample Matrix:SoilDate Analyzed:06/24Preservative:NoneDate Analyzed:06/24Condition:CoolDate Analyzed:06/24ParameterConcentrationLimitUnitsChloromethaneNDO.80ug/gBromomethaneNDO.80ug/gUichlorodifluoromethaneNDO.80ug/gChloroethaneNDO.80ug/gInfichloroethaneNDO.80ug/gTrichlorofluoromethaneNDO.80ug/g1,1-DichloroethaneNDO.80ug/g1,1-DichloroethaneNDO.80ug/g1,1-DichloroethaneNDO.80ug/g1,1-TrichloroethaneNDO.80ug/g1,1-TrichloroethaneNDO.80ug/g1,1-TrichloroethaneNDO.80ug/g1,1-TrichloroethaneNDO.80ug/g1,1-TrichloroethaneNDO.80ug/g1,2-DichloroethaneNDO.80ug/g1,1-TrichloroethaneNDO.80ug/g1,2-DichloropropeneNDO.80ug/g1,2-DichloropropeneNDO.80ug/g1,2-DichloropropeneNDO.80ug/g1,2-DichloropropeneNDO.80ug	/89
ParameterConcentrationDet.ChloromethaneND0.80ug/gBromomethaneND0.80ug/gDichlorodifluoromethaneND0.80ug/gDichlorodifluoromethaneND0.80ug/gChloroethaneND0.80ug/gChloroethaneND0.80ug/gChloroethaneND0.80ug/gTrichloroetheneND0.80ug/g1,1-DichloroetheneND0.80ug/gtrichlorofluoromethaneND0.80ug/gtrinchloroetheneND0.80ug/gtrinchloroethaneND0.80ug/gtrans-1,2-DichloroetheneND0.80ug/g1,1-TrichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gGarbon TetrachlorideND0.80ug/g1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gtrichloroethene (TCE)ND0.80ug/g	/89 /89
Chloromethane ND 0.80 ug/g Bromomethane ND 0.80 ug/g Dichlorodifluoromethane ND 0.80 ug/g Vinyl Chloride ND 0.80 ug/g Chloroethane ND 0.80 ug/g Methylene Chloride ND 0.80 ug/g 1,1-Dichloroethene ND 0.80 ug/g 1,1-Dichloroethane ND 0.80 ug/g 1,1-Dichloroethane ND 0.80 ug/g 1,1-Dichloroethane ND 0.80 ug/g 1,2-Dichloroethane ND 0.80 ug/g 1,2-Dichloroethane ND 0.80 ug/g 1,1,1-Trichloroethane ND 0.80 ug/g Garbon Tetrachloride ND 0.80 ug/g 1,2-Dichloropropane ND 0.80 ug/g 1,2-Dichloropropane ND 0.80 ug/g 1,3-Dichloropropene	
ChloromethaneND0.80ug/gBromomethaneND0.80ug/gDichlorodifluoromethaneND0.80ug/gVinyl ChlorideND0.80ug/gChloroethaneND0.80ug/gMethylene ChlorideND0.80ug/gI,1-DichloroetheneND0.80ug/gTrichlorofluoromethaneND0.80ug/g1,1-DichloroetheneND0.80ug/g1,1-DichloroethaneND0.80ug/g1,1-DichloroethaneND0.80ug/g1,1-DichloroethaneND0.80ug/g1,2-DichloroethaneND0.80ug/g1,2-DichloroethaneND0.80ug/g1,2-DichloroethaneND0.80ug/g1,2-DichloroethaneND0.80ug/g1,2-DichloroethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g1,2-DichloropethaneND0.80ug/g	
Bromomethane ND 0.80 ug/g Dichlorodifluoromethane ND 0.80 ug/g Vinyl Chloride ND 0.80 ug/g Chloroethane ND 0.80 ug/g Methylene Chloride ND 0.80 ug/g 1,1-Dichloroethene ND 0.80 ug/g Trichlorofluoromethane ND 0.80 ug/g 1,1-Dichloroethane ND 0.80 ug/g 1,1-Dichloroethane ND 0.80 ug/g 1,1-Dichloroethane ND 0.80 ug/g 1,1-Dichloroethane ND 0.80 ug/g 1,2-Dichloroethane ND 0.80 ug/g 1,1,1-Trichloroethane ND 0.80 ug/g Carbon Tetrachloride ND 0.80 ug/g I,2-Dichloropropane ND 0.80 ug/g I,2-Dichloropropane ND 0.80 ug/g I,2-Dichloropropane ND 0.80 ug/g <td< td=""><td></td></td<>	
Dichlorodifluoromethane ND 0.80 ug/g Vinyl Chloride ND 0.80 ug/g Chloroethane ND 0.80 ug/g Methylene Chloride ND 0.80 ug/g I,1-Dichloroethene ND 0.80 ug/g Trichlorofluoromethane ND 0.80 ug/g 1,1-Dichloroethane ND 0.80 ug/g trans-1,2-Dichloroethene ND 0.80 ug/g chloroform ND 0.80 ug/g 1,1-Trichloroethane ND 0.80 ug/g chloroform ND 0.80 ug/g 1,1,1-Trichloroethane ND 0.80 ug/g 1,1,1-Trichloroethane ND 0.80 ug/g Garbon Tetrachloride ND 0.80 ug/g 1,2-Dichloropropane ND 0.80 ug/g 1,2-Dichloropropane ND 0.80 ug/g 1,2-Dichloropropane ND 0.80 ug/g <td< td=""><td></td></td<>	
Vinyl ChlorideND0.80ug/gChloroethaneND0.80ug/gMethylene ChlorideND0.80ug/g1,1-DichloroetheneND0.80ug/gTrichlorofluoromethaneND0.80ug/g1,1-DichloroethaneND0.80ug/gtrans-1,2-DichloroetheneND0.80ug/gchloroformND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1-TrichloroethaneND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/gBromodichloromethaneND0.80ug/g1,2-DichloropropaneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene (TCE)ND0.80ug/g	
ChloroethaneND0.80ug/gMethylene ChlorideND0.80ug/g1,1-DichloroetheneND0.80ug/gTrichlorofluoromethaneND0.80ug/g1,1-DichloroethaneND0.80ug/gtrans-1,2-DichloroetheneND0.80ug/gchloroformND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1-TrichloroethaneND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/g1,2-DichloropropaneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene (TCE)ND0.80ug/g	
Methylene ChlorideND0.80ug/g1,1-DichloroetheneND0.80ug/gTrichlorofluoromethaneND0.80ug/g1,1-DichloroethaneND0.80ug/gtrans-1,2-DichloroetheneND0.80ug/gChloroformND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1-TrichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/g1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene (TCE)ND0.80ug/g	
1,1-DichloroetheneND0.80ug/gTrichlorofluoromethaneND0.80ug/g1,1-DichloroethaneND0.80ug/gtrans-1,2-DichloroetheneND0.80ug/gChloroformND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/g1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene (TCE)ND0.80ug/g	
TrichlorofluoromethaneND0.80ug/g1,1-DichloroethaneND0.80ug/gtrans-1,2-DichloroetheneND0.80ug/gChloroformND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/g1,2-DichloropropaneND0.80ug/gcarbon TetrachlorideND0.80ug/g1,2-DichloropropaneND0.80ug/g1,2-DichloropropaneND0.80ug/g1,2-DichloropropeneND0.80ug/g1,3-DichloropropeneND0.80ug/gTrichloroethene (TCE)ND0.80ug/g	
1,1-DichloroethaneND0.80ug/gtrans-1,2-DichloroetheneND0.80ug/gChloroformND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/gBromodichloromethaneND0.80ug/g1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene (TCE)ND0.80ug/g	
trans-1,2-DichloroetheneND0.80ug/gChloroformND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/gBromodichloromethaneND0.80ug/g1,2-DichloropropaneND0.80ug/g1,2-DichloropropaneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroetheneND0.80ug/g	
ChloroformND0.80ug/g1,2-DichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/gBromodichloromethaneND0.80ug/g1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroetheneND0.80ug/g	
1,2-DichloroethaneND0.80ug/g1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/gBromodichloromethaneND0.80ug/g1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene(TCE)ND0.80ug/g	
1,1,1-TrichloroethaneND0.80ug/gCarbon TetrachlorideND0.80ug/gBromodichloromethaneND0.80ug/g1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene(TCE)ND0.80ug/g	
BromodichloromethaneND0.80ug/g1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene(TCE)ND0.80ug/g	
1,2-DichloropropaneND0.80ug/gcis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene(TCE)ND0.80ug/g	
cis-1,3-DichloropropeneND0.80ug/gtrans-1,3-DichloropropeneND0.80ug/gTrichloroethene(TCE)ND0.80ug/g	
trans-1,3-DichloropropeneND0.80ug/gTrichloroethene(TCE)ND0.80ug/g	
Trichloroethene (TCE) ND 0.80 ug/g	
Dibromochloromethane ND 0.80 ug/g	
1,1,2-Trichloroethane ND 0.80 ug/g	
2-Chloroethylvinyl ether ND 0.80 ug/g	
Bromoform ND 0.80 ug/g	
1,1,2,2-Tetrachloroethane ND 0.80 ug/g	
Tetrachloroethene (PCE) ND 0.80 ug/g	
Chlorobenzene ND 0.80 ug/g	
1,3-Dichlorobenzene ND 0.80 ug/g	
1,2-Dichlorobenzene ND 0.80 ug/g	
1,4-Dichlorobenzene ND 0.80 ug/g	

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Dack M. Morgan Organic Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	T1-East	Date Sampled:	06/12/89
Laboratory Number:	C89021	Date Received:	
Analysis Requested:		Date Extracted:	
Sample Matrix:	Soil	Date Analyzed:	06/24/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Parameter	Concentration	Limit	Units
and provided and a state and and and a state	terrer billet diele mehr biete part wert erste erste wert biete state		
Benzene	ND	0.20	ug/g
	ND ND	0.20 0.20 0.20	ug/g ug/g
Benzene			
Benzene Toluene	ND	0.20	ug∕g
Benzene Toluene Ethylbenzene	ND ND	0.20 0.20	ug/g ug/g
Benzene Toluene Ethylbenzene Chlorobenzene	ND ND ND	0.20 0.20 0.20	ug/g ug/g ug/g
Benzene Toluene Ethylbenzene Chlorobenzene p,m-Xylene	ND ND ND 0.78 ND	0.20 0.20 0.20 0.20 0.20	ug/g ug/g ug/g
Benzene Toluene Ethylbenzene Chlorobenzene p,m-Xylene o-Xylene	ND ND ND 0.98 ND ND	0.20 0.20 0.20 0.20 0.20 0.20	ug/g ug/g ug/g ug/g
Benzene Toluene Ethylbenzene Chlorobenzene p.m-Xylene o-Xylene 1,4 Dichlorobenzene	ND ND 0.98 ND ND ND ND	0.20 0.20 0.20 0.20 0.20 0.20 0.20	ug/g ug/g ug/g

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Morgan Organie Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Freservative: Condition:	T1-Cente C89022 Volatile Soil None Cool		ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/12/89 06/16/89 06/24/89 06/24/89
Parameter		Cond	entration		Det. Limit	Units
Chloromethane			ND		0.70	ug/g
Bromomethane			ND		0.70	ug∕g
Dichlorodifluoromet	hane		ND		0.70	uq/g
Vinyl Chloride			ND		0,70	ug∕g
Chlorpethane			ND		Ŏ . 7Ŏ	ug∕g
Methylene Chloride	<i>x</i>		ND		0.70	uq∕q
1,1-Dichloroethene			ND		Ŏ . 70	ug/g
Trichlorofluorometh	ane		ND		0.70	ug∕g
1,1-Dichloroethane			ND		0.70	ug∕g
trans-1,2-Dichlorce	thene		ND		0.70	ug∕g
Chloroform			ND		0.70	ug∕g
1,2-Dichloroethane			ND		0.70	ug∕a
1,1,1-Trichloroetha			ND		0.70	ug/g
Carbon Tetrachlorid			ND		0.70	ug∕g
Bromodichloromethan	e		ND		0.70	ug/g
1,2-Dichloropropane			ND		0.70	ug∕g
cis-1,3-Dichloropro			ND		0.70	uġ∕ġ
trans-1,3-Dichlorop			ND		0.70	ug∕g
Trichloroethene (TC			ND		0.70	ug/g
Dibromochloromethan			ND		0.70	ug/g
1,1,2-Trichloroetha			ND		0.70	ug∕g
2-Chloroethylvinyl	ether		ND		0.70	ug/g
Bromoform			ND		0.70	ug/g
1,1,2,2-Tetrachloro			ND		0.70	ug∕g
Tetrachloroethene (FLE)		ND		0.70	ug∕g
Chlorobenzene			ND		0.70	ug∕g
1,3-Dichlorobenzene			ND		0.70	ug∕g
1,2-Dichlorobenzene			ND		0.70	ug/g
1,4-Dichlorobenzene			ND		0.70	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit. Comments:

Regiewed by

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Jack M. Morgan Organic Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	T1-Center	Date Sampled:	06/12/89
Laboratory Number:	C89022	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/24/89
Sample Matrix:	Soil	Date Analyzed:	06/24/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Parameter	Concentration	Limit	Units
	which same were state than their same trade that same beau same trade and	alian katan appa appa ajan	
Benzene	ND	0.14	ug∕g
Toluene	0.16	0.14	ug∕g
Ethylbenzene	ND	0.14	ug/g
Chlorobenzene	ND	0 .1 4	ug∕g
p,m-Xylene	ND	0.14	ug/g
o-Xylene	ND	0.14	ug/g
1,4 Dichlorobenzene	ND	0.14	ug∕g
1,3 Dichlorobenzene	ND	0.14	ug∕g
1,2 Dichlorobenzene		O.14	

Method: Metho

Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

ack M. Morgan Drganic Analyst

Fyqviewed by

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T1-West C89023 Volatile Soil None Cool	Halı	ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/12/89 06/16/89 06/26/89 06/26/89
Parameter		Cond	centration		Det. Limit	Units
Chloromethane			ND		0.51	uq/q
Bromomethane			ND		0.51	uĝ/ĝ
Dichlorodifluoromet	hane		ND		0.51	ug/g
Vinyl Chloride			ND		0.51	ug/g
Chloroethane			ND		0.51	ug/g
Methyl ene Chloride			ND)		0.51	ug/g
1,1-Dichloroethene			ND		0.51	ug/g
Trichlorofluorometh	ane		ND		0.51	ug∕g
1,1-Dichloroethane			ND		0.51	ug/g
trans-1,2-Dichlorce	thene		ND		O.51	ug∕g
Chloroform			ND		0.51	ug/g
1,2-Dichloroethane			ND		0.51	ug∕g
1,1,1-Trichloroetha	ne		ND		0.51	ug/g
Carbon Tetrachlorid	e		ND		0.51	ug/g
Bromodichloromethan			ND		0.51	ug/g
1,2-Dichloropropane			ND		0.51	ug∕g
cis-1,3-Dichloropro	pene		ND		0.51	ug/g
trans-1,3-Dichlorop	ropene		ND		0.51	ug∕g
Trichloroethene (TC	E)		ND		0.51	ug/g
Dibromochloromethan	e		ND		0.51	ug/g
1,1,2-Trichloroetha			ND		0.51	ug/g
2-Chloroethylvinyl	ether		ND		0.51	ug∕g
Bromoform			ND		0.51	ug/g
1,1,2,2-Tetrachloro			ND		0.51	ug/g
Tetrachloroethene (PCE)		ND		0.51	ug∕g
Chlorobenzene			ND		0.51	ug∕g
1,3-Dichlorobenzene			ND		0.51	ug∕g
1,2-Dichlorobenzene			ND		0.5t	ug∕g
1,4-Dichlorobenzene			ND		0.51	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit.

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

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Jack M. Morgan Organic Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	T1-West	Date Sampled:	06/12/89
Laboratory Number:	C89023	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/26/89
Sample Matrix:	Soil	Date Analyzed:	06/26/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Farameter	Concentration	Limit	Units
		anna actas a ar an anna	
Benzene	ND	0.10	ug∕g
Toluene	ND	0.10	ug∕a
Ethylbenzene	ND	0.10	ug/g
Chlorobenzene	ND	O., 1.O	ug∕g
p,m-Xylene	0.73	0.10	ug/g
o-Xylene	ND	0.10	ug∕g
1,4 Dichlorobenzene	ND	0.10	ug∕g
1,3 Dichlorobenzene	ND	0.10	ug∕g
1,2 Dichlorobenzene	ND	0.10	ug∕g

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Jack 1. Morgan Organic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T2-East C89024 Volatile Soil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/23/89 06/23/89
		_	Det.	
Parameter		Concentration	Limit	Units
Chloromethane		ND	0.84	uq/q
Bromomethane		ND	0.84	ug∕g
Dichlorodifluoromet	hane	ND	0.84	ug/g
Vinyl Chloride		ND	0.84	uġ∕ġ
Chloroethane		ND	0,84	ug/g
Methylene Chloride		ND	0.84	ug/g
1,1-Dichloroethene		ND	0. 84	ug∕g
Trichlorofluorometh	ane	ND	0.84	ug∕g
1,1-Dichloroethane		ND	0.84	ug/g
trans-1,2-Dichloroe	thene	ND	0.84	ug∕g
Chloroform		ND	0.84	ug/g
1,2-Dichloroethane		ND	0. 84	ug∕g
1,1,1-Trichloroetha		ND	0.84	ug/g
Carbon Tetrachlorid		ND	0.84	ug∕g
Bromodichloromethan		ND	0.84	ug/g
1,2-Dichloropropane		ND	0.84	ug∕g
cis-1,3-Dichloropro	•	ND	0.84	ug/g
trans-1,3-Dichlorop		ND	0.84	ug∕g
Trichloroethene (TC		ND	0.84	ug∕g
Dibromochloromethan		ND	. 84	ug∕g
1,1,2-Trichloroetha		ND	0.84	ug∕g
2-Chloroethylvinyl	ether	ND	O. 84	ug∕g
Bromoform		ND	0.84	ug∕g
1,1,2,2-Tetrachloro		ND	O. 84	uą∕g
Tetrachloroethene (PCE)	ND	0.84	ug∕g
Chlorobenzene		ND	0.84	ug∕g
1,3-Dichlorobenzene		ND	0.84	ug∕g
1,2-Dichlorobenzene		ND	0.84	ug∕g
1,4-Dichlorobenzene		ND	0.84	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

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Jack M Morgan Organic Analyst

Client:	KW Brown	and	Associates	Report Date:	06/30/89
Sample ID		Т2-Е		Date Sampled:	06/12/89
Laborator	,	C890		Date Received:	06/16/89
•	Requested:	8020		Date Extracted:	
Sample Ma	trix:	Soil		Date Analyzed:	06/23/89
Preservat	ive:	Cool			
Condition	н Ц	Appe	ars Good		
				Det.	
Parameter			Concentration	Limit	Units
Benzene			0.22	0.17	ug/g
Toluene			0.35	O. 17	ug∕g
Ethylbenz	ene		ND	0.17	ug/g
Chloroben	zene		ND	0.17	ug∕g
p,m-Xylen	ē		ND	O.17	ug/g
o-Xylene			ND	0.17	ug/g
1,4 Dichl	orobenzene		ND	O.17	ug/g
1,3 Dichl	orobenzene		ND	0.17	ug/g
1,2 Dichl	orobenzene		ND	0.17	ug/g

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Regiewed by

A I IN Jack M.) Morgan

Drganic Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T2-Cente C89025 Volatile Soil None Cool		ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/12/89 06/16/89 06/24/89 06/24/89
Parameter		Con	centration		Det. Limit	Units
Chloromethane			ND		0.78	ug∕g
Bromomethane			ND		0.78	ug/g
Dichlorodifluoromet	hane		ND		0.78	ug∕g
Vinyl Chloride			ND		0.78	ug/g
Chloroethane			ND		0.78	ug/g
Methylene Chloride			ND		0.78	ug/g
1,1-Dichloroethene			ND		0.78 0.78	ug/g
Trichlorofluorometh	ane		ND ND		0.78	ug/g
1,1-Dichloroethane	da ha an an		ND		0.78	ug/g ug/g
trans-1,2-Dichloroe Chloroform	thene		ND		0.78	
			ND		0.78	ug/g ug/q
1,2-Dichloroethane	~~		ND		0.78	ug/g ug/g
1,1,1-Trichloroetha Carbon Tetrachlorid			ND		0.78	ug∕g ug∕g
Bromodichloromethan			ND		0.78	ug/g
1,2-Dichloropropane			ND		0.78	ug/g ug/g
cis-1,3-Dichloropro			ND		0.78	ug/g
trans-1.3-Dichlorop			ND		0.78	uq/g
Trichloroethene (TC			ND		0.78	ug/g ug/g
Dibromochloromethan			ND		0.78	ug/g ug/g
1,1,2-Trichloroetha			ND		0.78	ug/g ug/g
2-Chloroethylvinyl			ND		0.78	ug/g
Bromoform			ND		0.78	ug/g
1,1,2,2-Tetrachloro	othano		ND		0.78	ug/g
Tetrachloroethene (ND		0.78	uq/q
Chlorobenzene	s - tel land /		ND		0.78	uq/q
1,3-Dichlorobenzene			ND		0.78	ug/g
1,2-Dichlorobenzene			ND		0.78	ug/g
1,4-Dichlorobenzene			ND		0.78	ug/g
an gu ru an ra cran ba't bailer bailt baile. An Istai						

Method 8010, Halogenated Volatile Organics, SW-846, USEPA Method: (Sept. 1986). ND - Parameter not detected at the stated detection limit.

Revjewed by

Jack M. Morgan Organic Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	T2-Center C89025 8020 Soil Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/12/89 06/16/89 06/24/89 06/24/89
Condition: Parameter	Appears Good Concentration	Det. Limit	Units
Benzene Toluene Ethylbenzene Chlorobenzene p,m-Xylene o-Xylene 1,4 Dichlorobenzene 1,3 Dichlorobenzene 1,2 Dichlorobenzene	ND 0.26 ND ND 0.94 ND ND ND ND ND	0.16 0.16 0.16 0.16 0.16 0.16 0.16 0.16	ug/g ug/g ug/g ug/g ug/g ug/g ug/g

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Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

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Jack M. Morgan Organic Analyst

Client:	KW Brown	and	Associates	Report	Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T2-West C89026 Volatile Soil None Cool	Halo	ocarbons	Date R Date E	ampled: eceived: ×tracted: nalyzed:	06/12/89 06/16/89 06/22/89 06/22/89
Parameter		~ ~~~	centration		Det. Limit	Units
Faramecer			Lentration			
Chloromethane			ND		0.98	ug/g
Bromomethane			ND		0.98	ua/g
Dichlorodifluoromet	hane		ND		0.98	ug/g
Vinyl Chloride			ND		0.98	uġ/ġ
Chloroethane			ND		0.98	ug/g
Methylene Chloride			ND		Ö.98	ug/g
1,1-Dichloroethene			ND		0.98	ug/g
Trichlorofluorometh	ane		ND		0.98	ug∕g
1,1-Dichloroethane			ND		0.98	ug/g
trans-1,2-Dichloroe	thene		ND		o.98	ug∕g
Chloroform			ND		0.98	ug/g
1,2-Dichloroethane			ND		0.98	ug∕g
1,1,1-Trichloroethane			ND		0.98	ug∕g
Carbon Tetrachloride			ND		0.98	ug∕g
Bromodichloromethane			ND		0.98	ug/g
1,2-Dichloropropane			ND		o.98	ug/g
cis-1,3-Dichloropropene			ND		0.98	ug/g
trans-1,3-Dichloropropene			ND		o.98	ug∕g
Trichloroethene (TC			ND		0.98	ug/g
Dibromochloromethane			ND		0.98	ug∕g
1,1,2-Trichloroethane			ND		0.98	ug∕g
2-Chloroethylvinyl ether			ND		0.98	ug∕g
Bromoform			ND		0.98	ug/g
1,1,2,2-Tetrachloroethane			ND		0.78	ug/g
Tetrachloroethene (PCE)		ND		0.98	ug∕g
Chlorobenzene			ND		0.98	ug/g
1,3-Dichlorobenzene			ND		0.98	ug/g
1,2-Dichlorobenzene			ND		0.98	ug/g
1,4-Dichlorobenzene			ND		0.98	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit. Comments:

Rexiewed by

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Jack M. Morgan Organic Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	T2-West C:89026 8020 Soil Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	
Condition:	Appears Good		
Farameter	Concentration	Det. Limit	Units
	Mitte Main days and your cases and Sign agent ways agent	and, fond addre upday upday	
Benzene	ND	0.20	ug∕g
Toluene	ND	0.20	ug/g
Ethylbenzene	ND	0.20	ug/g
Chlorobenzene	ND	0.20	ug/g
p,m-Xylene	ND	0.20	ug∕g
o-Xylene	ND	0.20	ug/g
1,4 Dichlorobenzene	ND	0.20	ug/g
1,3 Dichlorobenzene	ND	0.20	ug/g
1,2 Dichlorobenzene	ND	0.20	ug∕g

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Organic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T3-East C89027 Volatile Soil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/22/89 06/22/89
			Det.	
Parameter		Concentration	Limit	Units
Chloromethane		 ND	0.92	ug/g
Bromomethane		ND	0.92	ua/a
Dichlorodifluoromet	hane	ND	0.92	uq/q
Vinyl Chloride		ND	0.92	uq/g
Chloroethane		ND	0.92	ug/g
Methylene Chloride		ND	0.92	uą∕ą
1,1-Dichloroethene		ND	0.92	ug∕g
Trichlorofluorometh	ane	ND	0,92	uq/g
1,1-Dichloroethane		ND	0.92	ug/g
trans-1,2-Dichloroe	thene	ND	0.92	ug∕g
Chloroform		ND	0.92	ug∕g
1,2-Dichloroethane		ND	0.92	ug∕g
1,1,1-Trichloroetha		ND	0.92	ug/g
Carbon Tetrachlorid		ND	0.92	ug∕g
Bromodichloromethan		ND	0.92	ug/g
1,2-Dichloropropane		ND	0.92	ug∕g
cis-1,3-Dichloropropene		ND	Ŏ . 92	ug∕g
trans-1,3-Dichloropropene		ND	0.92	ug∕g
Trichloroethene (TC		ND	0.92	ug/g
Dibromochloromethan		ND	0.92	ug/g
1,1,2-Trichloroethane		ND	0.92	ug/g
2-Chloroethylvinyl ether		ND	0.92	ug/g
Bromoform		ND	0.92	ug/g
1,1,2,2-Tetrachloro		ND	0.92	ug/g
Tetrachloroethene (PCE)	ND	0.92	ug/g
Chlorobenzene		ND	0.92	ug/g
1,3-Dichlorobenzene		ND	0.92	ug∕g
1,2-Dichlorobenzene		ND	0.92	ug/g
1,4-Dichlorobenzene		ND	0.92	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit.

ND - Farameter not detected at the stated detection limit. Comments:

Reviewed by

Jack M. Morgan Organic Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	T3-East	Date Sampled:	06/13/89
Laboratory Number:	C89027	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/22/89
Sample Matrix:	Soil	Date Analyzed:	06/22/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Parameter	Concentration	Limit	Units
anges year gener anges data, tatat have mean anter	Man dan and Man day were the star and the same and the		utured harmon specific billion specific
Benzene	ND	0.18	ug/g
Toluene	ND	0.18	ug/g
Ethylbenzene	ND	0.18	ug/g
Chlorobenzene	ND	0.18	ug∕g
p,m-Xylene	ND	0.18	ug/g
o-Xylene	ND	0.18	ug/g
1,4 Dichlorobenzene	ND	0.18	ug/g
1,3 Dichlorobenzene	ND	0.18	ug∕g
1,2 Dichlorobenzene	ND	0.18	ug/g

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Organie Analyst

Client:	KW Brown	and	Associates	Report	Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T3-Cente C89028 Volatile Soil None Cool		ocarbons	Date R Date E	ampled: eceived: xtracted: malyzed:	06/13/89 06/16/89 06/26/89 06/26/89
Parameter		Con	centration		Det. Limit	Units
Chloromethane Bromomethane Dichlorodifluorometh Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene Trichlorofluoromethane trans-1,2-Dichloroethane trans-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane 1,2-Dichloropethane 1,2-Dichloropethane 1,2-Dichloropethane 1,2-Dichloropethane 1,2-Dichloropethane 1,2-Dichloropethane 1,2-Dichloropethane 1,2-Dichloropethane 1,2-Dichloropethane 1,1,2-Trichloroethane 1,1,2-Trichloroethane 1,1,2,2-Tetrachloroe Tetrachloroethene (Chlorobenzeme 1,3-Dichlorobenzene	ane thene ne e pene ropene e ne ether ethane		ND ND ND ND ND ND ND ND ND ND ND ND ND N		0.60 0.60	ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g
1,2-Dichlorobenzene 1,4-Dichlorobenzene			ND		0.60	ug/g ug/g

Method:

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Felviewed by Back(M) Morgan

Organic Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T3-Center C89028 8020 Soil Cool Appears Good	Date Sampled: Date Received: Date Extracted: Date Analyzed:	
Parameter	Concentration	Det. Limit	Units
Benzene Toluene Ethylbenzene Chlorobenzene p,m-Xylene o-Xylene 1,4 Dichlorobenzene 1,3 Dichlorobenzene 1,2 Dichlorobenzene	ND	0.12 0.12 0.12 0.12 0.12 0.12 0.12 0.12	ug/g ug/g ug/g ug/g ug/g ug/g ug/g

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

IIIA Ja‡k M. Horgan Organic Analyst
Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T3-West C89029 Volatile Soil None Cool	Halo	ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/13/89 06/16/89 06/27/89 06/27/89
_		_			Det.	
Parameter		Cond	centration		Limit	Units
Chloromethane			ND		0.54	ug/g
Bromomethane			ND		0.54	ug/g
Dichlorodifluorometh	nane		ND		0.54	ug/g
Vinyl Chloride			ND		0.54	ug/g
Chloroethane			ND		0.54	ug/g
Methylene Chloride			ND		0.54	ug/g
1,1-Dichloroethene			ND		0.54	ug/g
Trichlorofluorometh	ane		ND		0.54	ug∕g
1,1-Dichloroethane			ND		0.54	ug/g
trans-1,2-Dichloroe	thene		ND		0.54	uq∕g
Chloroform			ND		0.54	ug∕g
1,2-Dichloroethane			ND		0.54	ug∕g
1,1,1-Trichloroetha			ND		0.54	ug∕g
Carbon Tetrachlorid			ND		0.54	ug∕g
Bromodichloromethan	n		ND		0.54	ug∕g
1,2-Dichloropropane			ND		0.54	ug∕g
cis-1,3-Dichloroprop			ND		0.54	ug/g
trans-1,3-Dichlorop	•		ND		0.54	ug∕g
Trichloroethene (TC	E)		ND		0.54	ug/g
Dibromochloromethan			ND		0.54	ug∕g
1,1,2-Trichloroetha			ND		0.54	ug/g
2-Chloroethylvinyl	ether		ND		0.54	ug∕g
Bromoform			ND		0.54	ug/g
1,1,2,2-Tetrachloro			ND		0.54	ug∕g
Tetrachloroethene (PCE)		ND		0.54	ug∕g
Chlorobenzene			ND		0.54	ug∕g
1,3-Dichlorobenzene			ND		0.54	ug∕g
1,2-Dichlorobenzene			ND		0.54	ug/g
1,4-Dichlorobenzene			ND		0.54	ug/g

Method 8010, Halogenated Volatile Organics, SW-846, USEFA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	TS-West	Date Sampled:	06/13/89
Laboratory Number:	C89029	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/27/89
Sample Matrix:	Soil	Date Analyzed:	06/27/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Farameter	Concentration	L.imit	Units
norm anna bala basa akar akar akar ana puny	and been about the state and a same and a same and a same and a same and		
Benzene	ND	0.11	ug∕g
Toluene	ND	0.11	ug∕a
Ethylbenzene	ND	0.11	ug∕g
Chlorobenzene	ND	0.11	ug∕g
p,m-Xylene	ND	0.11	ug∕g
o-Xylene	ND	0.11	ug∕g
1,4 Dichlorobenzene	ND	O.11	ug∕g
1,3 Dichlorobenzene	ND	0.11	uq/g
1,2 Dichlorobenzene	ND	0.11	ug/g

ND - Parameter not detected at the stated detection limit.

Comments:

Rexiewed by Jark M. Morgan Organic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/8 9
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T4-East C89030 Volatile Soil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/26/89 06/26/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	0.50	ug/g
Bromomethane		ND	0.50	ug/g
Dichlorodifluoromet	nane	ND	Ŏ.50	ug/g
Vinyl Chloride		ND	0.50	ug/g
Chloroethane		ND	0.5 0	ug/g
Methylene Chloride		ND	0.50	ug∕g
1,1-Dichloroethene		ND	0.50	ug∕g
Trichlorofluorometh	ane	ND	0.50	ug∕g
1,1-Dichloroethane		ND	0.50	ug∕g
trans-1,2-Dichloroe	thene	ND	0.50	ug∕g
Chloroform		ND	0.50	ug/g
1,2-Dichloroethane		ND	0.50	ug∕g
1,1,1-Trichloroetha	ne	ND	0.50	ug/g
Carbon Tetrachlorid		ND	0.50	ug∕g
Bromodichloromethan		ND	0.50	ug∕g
1,2-Dichloropropane		ND	0.50	ug∕g
cis-1,3-Dichloroprop		ND	0.50	ug∕g
trans-1,3-Dichlorop	ropene	ND	0.50	ug∕g
Trichloroethene (TC		ND	0.5 0	ug∕g
Dibromochloromethan		ND	0.50	ug∕g
1,1,2-Trichloroetha		ND	0.50	ug/g
2-Chloroethylvinyl	ether	ND	0.50	ug∕g
Bromoform		ND	0.50	ug/g
1,1,2,2-Tetrachloro		ND	0.50	ug∕g
Tetrachloroethene (PCE)	ND	0.50	ug∕g
Chlorobenzene		ND	0.50	ug∕g
1,3-Dichlorobenzene		ND	0.50	ug∕g
1,2-Dichlorobenzene		ND	0.50	ug∕g
1,4-Dichlorobenzene		ND	0.50	ug/g

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

MIN

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	T4-East	Date Sampled:	06/13/89
Laboratory Number:	089030	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/26/89
Sample Matrix:	Soil	Date Analyzed:	06/26/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Parameter	Concentration	Limit	Units
		-	
	ander befett anges ander anges ander hann hann hann ander ander ander		
Benzene	ND	0.10	ug/g
Toluene	ND ND	0.10	
			ug∕g
Toluene	ND	0.10	ug/g ug/g
Toluene Ethylbenzene Chlorobenzene p,m-Xylene	ND ND	0.10 0.10	na\a na\a
Toluene Ethylbenzene Chlorobenzene	ND ND ND	0.10 0.10 0.10	ug/g ug/g ug/g ug/g
Toluene Ethylbenzene Chlorobenzene p,m-Xylene	ND ND ND ND ND	0.10 0.10 0.10 0.10	ug/g ug/g ug/g ug/g
Toluene Ethylbenzene Chlorobenzene p,m-Xylene o-Xylene	ND ND ND ND ND ND	0.10 0.10 0.10 0.10 0.10	ug/g ug/g ug/g ug/g ug/g
Toluene Ethylbenzene Chlorobenzene p,m-Xylene o-Xylene 1,4 Dichlorobenzene	ND ND ND ND ND ND	0.10 0.10 0.10 0.10 0.10 0.10	ug/g ug/g ug/g ug/g ug/g ug/g

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Jark M. Morgan Organic Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T4-Center C89031 Volatile Soil None Cool		ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/13/89 06/16/89 06/27/89 06/27/89
Parameter		Cond			Det. Limit	Units
Chloromethane Bromomethane Dichlorodifluorometh Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene Trichlorofluorometha 1,1-Dichloroethane trans-1,2-Dichloroet Chloroform 1,2-Dichloroethane 1,1,1-Trichloroethar Carbon Tetrachloride	ane thene ne		ND ND ND ND ND ND ND ND ND ND ND ND		0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61	ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g
Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloroprop trans-1,3-Dichloroprop Trichloroethene (TCH Dibromochloromethane 1,1,2-Trichloroethan 2-Chloroethylviñyl (Bromoform 1,1,2,2-Tetrachloroe Tetrachloroethene (H Chlorobenzene 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene	e oene ropene E) e ne ether ethane		ND ND ND ND ND ND ND ND ND ND ND ND ND N		$\begin{array}{c} 0.61\\$	ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

MW

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T4-Center C89031 8020 Soil Cool Appears Good	Date Sampled: Date Received: Date Extracted: Date Analyzed:	
Parameter	Concentration	Det. Limit	Units
Names bilter grant faith and a state and a state and	-and make the state of the	nigati paulo none incre otten	
Benzene	ND	0.11	ug/g
Toluene	ND	0.11	ug∕g
Ethylbenzene	ND	0.11	ug/g
Chlorobenzene	ND	0.11	ug/g
p,m-Xylene	ND	0.11	ug∕g
o-Xylene	ND	0.11	ug∕g
1,4 Dichlorobenzene	ND	0.11	ug/g
1,3 Dichlorobenzene	ND	0.11	ug∕g
1.2 Dichlorobenzene	ND	0.11	ug/g

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by Jack M. Morgan

Organic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T4-West C89032 Volatile Scil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/27/89 06/27/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	0.61	ug∕g
Bromomethane		ND	0.61	ug/g
Dichlorodifluorometh	hane	ND	0.61	ug/g
Vinyl Chloride		ND	0.61	ug∕g
Chloroethane		ND	0.61	ug/g
Methylene Chloride		ND	0.61	ug∕g
1,1-Dichloroethene		ND	0.61	ug∕g
Trichlorofluorometha	ane	ND	0.61	ug∕g
1,1-Dichloroethane		ND	0.61	u g /g
trans-1,2-Dichloroet	thene	ND	0.61	ug∕g
Chloroform		ND	0.61	ug/g
1,2-Dichloroethane		ND	0.61	ug∕g
1,1,1-Trichloroethar	٦e	ND	0.61	ug/g
Carbon Tetrachloride		ND	0.61	ug/g
Bromodichloromethane	2	ND	0.61	ug∕g
1,2-Dichloropropane		ND	0.61	ug/g
cis-1,3-Dichloroprop		ND	0.61	ug/g
trans-1,3-Dichlorop	ropene	ND	0.61	ug∕g
Trichloroethene (TCB	E)	ND	0.61	ug/g
Dibromochloromethane	2	ND	0.61	ug/g
1,1,2-Trichloroethar	he	ND	0.61	ug/g
2-Chloroethylvinyl (ether	ND	0.61	ug/g
Bromoform		ND	0.61	ug/g
1,1,2,2-Tetrachloroe	ethane	ND	0.61	ug/g
Tetrachloroethene (F		ND	0.61	ug/g
Chlorobenzene		ND	O.61	ug/g
1,3-Dichlorobenzene		ND	0.61	ug/g
1,2-Dichlorobenzene		ND	0.61	uq/q
1,4-Dichlorobenzene		ND	0.61	ug/g

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by



Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	T4-West	Date Sampled:	06/13/89
Laboratory Number:	C89032	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/27/89
Sample Matrix:	Soil	Date Analyzed:	06/27/89
Freservative:	Cool		
Condition:	Appears Good		
		Det.	
Farameter	Concentration	Limit	Units
Benzene	ND	0.10	ug/g
Benzene Toluene	ND ND	0.10 0.10	ug∕g ug∕g
Toluene	ND	0.10	ug/g
Toluene Ethylbenzene	ND ND	0.10 0.10	ug/g ug/g
Toluene Ethylbenzene Chlorobenzene	ND ND ND	0.10 0.10 0.10	ug/g ug/g ug/g
Toluene Ethylbenzene Chlorobenzene p,m-Xylene	ND ND ND ND ND	0.10 0.10 0.10 0.10	ug/g ug/g ug/g
Toluene Ethylbenzene Chlorobenzene p,m-Xylene o-Xylene	ND ND ND ND ND ND	0.10 0.10 0.10 0.10 0.10	ug/g ug/g ug/g ug/g ug/g

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Client:	KW Brown	and Associates	Report Date:	07/07/89
Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	T5 C89033 Volatile Soil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/26/89 06/26/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	0.61	ug/g
Bromomethane		ND	0.61	uq/q
Dichlorodifluorometh	ane	ND	0.61	uq/q
Vinyl Chloride		ND	0.61	ug/g
Chloroethane		ND	0.61	ug/g
Methylene Chloride		ND	0.61	ug/g
1,1-Dichloroethene		ND	0.61	ug/g
Trichlorofluorometha	ine	ND	0.61	ug/g
1,1-Dichloroethane		ND	0.61	ug/g
trans-1,2-Dichloroet	hene	ND	0.61	ug/g
Chloroform		ND	0.61	ug/g
1,2-Dichloroethane		ND	0.61	ug∕g
1,1,1-Trichloroethan	e	ND	0.61	ug/g
Carbon Tetrachloride	?	ND	0.61	ug∕g
Bromodichloromethane	è	ND	0.61	ug/g
1,2-Dichloropropane		ND	0.61	ug∕g
cis-1,3-Dichloroprop	ene	ND	0.61	ug/g
trans-1,3-Dichloropr	opene	ND	0.61	ug∕g
Trichloroethene (TCE		ND	0.61	ug∕g
Dibromochloromethane	è	ND	0.61	ug∕g
1,1,2-Trichloroethan	e	ND	0.61	ug∕g
2-Chloroethylvinyl e	ether	ND	Ŏ . 61	ug∕g
Bromoform		ND	0.61	ug/g
1,1,2,2-Tetrachloroe	othane	ND	O.61	ug∕g
Tetrachloroethene (F	PCE)	ND	0.61	ug∕g
Chlorobenzene		ND	O.61	ug∕g
1,3-Dichlorobenzene		ND	Ö., 61	ug/g
1,2-Dichlorobenzene		ND	0.61	ug∕g
1,4-Dichlorobenzene		ND	0.61	ug/g

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

И Jack M. Morgan Organic Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	TS	Date Sampled:	06/13/89
Laboratory Number:	C89033	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/26/89
Sample Matrix:	Soil	Date Analyzed:	06/26/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Parameter	Concentration	Limit	Units
Benzene	ND	0.12	ug/g
Toluene	ND	0.12	uq/q
Ethylbenzene	ND	0.12	ug/g
Chlorobenzene	ND	0.12	uġ∕ġ
p,m-Xylene	ND	0.12	ug/g
o-Xylene	ND	0.12	ug∕g
1,4 Dichlorobenzene	ND	0.12	ug/g
1,3 Dichlorobenzene	ND	0.12	ug/g
1,2 Dichlorobenzene	ND	0.12	ug∕g

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Ack M Morgan Grganic Analyst

Sample ID:Pit North CS9034Date Sampled:06/13/89 06/16/89Laboratory Number:CS9034 CS9034Date Received:06/16/89 Date Extracted:06/27/89 06/27/89Sample Matrix:SoilDate Extracted:06/27/89 Date Analyzed:06/27/89Preservative:NoneDate Extracted:06/27/89Condition:CoolDate Extracted:06/27/89ChloromethaneNDLimitUnitsChloromethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gChloromethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gChloroethaneND1.2ug/gJi-1-DichloroethaneND1.2ug/gTrachlorofluoromethaneND1.2ug/gTrachlorofluoromethaneND1.2ug/gI, 1-DichloroetheneND1.2ug/gI, 1-DichloroetheneND1.2ug/gI, 1-DichloroethaneND1.2ug/gI, 1, 1-TrichloroethaneND1.2ug/gI, 2-DichloroethaneND1.2ug/gI, 2-DichloropropeneND1.2ug/gI, 2-DichloropropeneND1.2ug/gI, 2-DichloropropeneND1.2ug/gI, 2-DichloropropeneND1.2ug/gI, 2-DichloropropeneND1.2ug/gI, 2-DichloropropeneND1.2ug/gI, 2-Dichloroprope	Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
ParameterConcentrationLimitUnitsChloromethaneND1.2ug/gBromomethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gChlorodifluoromethaneND1.2ug/gVinyl ChlorideND1.2ug/gChloroethaneND1.2ug/gMethylene ChlorideND1.2ug/g1,1-DichloroethaneND1.2ug/grichlorofluoromethaneND1.2ug/grichlorofluoromethaneND1.2ug/gtrans-1,2-DichloroethaneND1.2ug/gchloroformND1.2ug/g1,1-TrichloroethaneND1.2ug/gcarbon TetrachlorideND1.2ug/ggrans-1,3-DichloropeneND1.2ug/grichloropopaneND1.2ug/grichloropethaneND1.2ug/ggrans-1,3-DichloropopeneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug/grichloroethaneND1.2ug	Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	C89034 Volatile Soil None		ocarbons	Date Date	Received: Extracted:	06/16/89 06/27/89
ChloromethaneND1.2ug/gBromomethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gChloroethaneND1.2ug/gChloroethaneND1.2ug/gMethylene ChlorideND1.2ug/g1.1-DichloroethaneND1.2ug/gTrichlorofluoromethaneND1.2ug/gtrians=1,2-DichloroethaneND1.2ug/gtrians=1,2-DichloroethaneND1.2ug/g1,1-TrichloroethaneND1.2ug/gcarbon TetrachlorideND1.2ug/gcarbon TetrachlorideND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gpirchloroethaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gpirchloroethaneND1.2ug/grichloroethaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gpibromochloromethaneND1.2ug/grichloroethylvinyl etherND1.2ug/g1,1,2-TrichloroethaneND1.2ug/gretrachloroetheneND1.2ug/gretrachloroetheneND1.2ug/grichlorobenzeneND1.2ug/grichlorobenzeneND1.2ug/g <td></td> <td></td> <td>Cond</td> <td>centration</td> <td></td> <td>Limit</td> <td></td>			Cond	centration		Limit	
Dichlorodifluoromethane ND 1.2 ug/g Vinyl Chloride ND 1.2 ug/g Chloroethane ND 1.2 ug/g Methylene Chloride ND 1.2 ug/g 1.1-Dichloroethane ND 1.2 ug/g Trichlorofluoromethane ND 1.2 ug/g 1.1-Dichloroethane ND 1.2 ug/g 1.1-Dichloroethane ND 1.2 ug/g trans-1,2-Dichloroethane ND 1.2 ug/g chloroform ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g carbon Tetrachloride ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g j,1,2-Trichloroethane ND 1.2 ug/g				ND			
Vinyl Chloride ND 1.2 ug/g Chloroethane ND 1.2 ug/g Methylene Chloride ND 1.2 ug/g 1,1-Dichloroethene ND 1.2 ug/g Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g trans-1,2-Dichloroethene ND 1.2 ug/g chloroform ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g carbon Tetrachloride ND 1.2 ug/g frans-1,3-Dichloropropane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g dibromethane ND 1.2 ug/g frichloroethane ND 1.2 ug/g frichloroptopene ND 1.2 ug/g i.1,2 </td <td>Bromomethane</td> <td></td> <td></td> <td>ND</td> <td></td> <td>1.2</td> <td>uq/q</td>	Bromomethane			ND		1.2	uq/q
Chloroethane ND 1.2 ug/g Methylene Chloride ND 1.2 ug/g 1,1-Dichloroethene ND 1.2 ug/g Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g chloroform ND 1.2 ug/g chloroform ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g chloroform ND 1.2 ug/g f.1,1-Trichloroethane ND 1.2 ug/g garbon Tetrachloride ND 1.2 ug/g f.2-Dichloropropane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g richloroethene (TCE) ND 1.2 ug/g pibromochloromethane ND 1.2 ug/g gari,1,2-Trichloroethane <td>Dichlorodifluorometh</td> <td>nane</td> <td></td> <td>ND</td> <td></td> <td>1.2</td> <td></td>	Dichlorodifluorometh	nane		ND		1.2	
Chloroethane ND 1.2 ug/g Methylene Chloride ND 1.2 ug/g 1,1-Dichloroethene ND 1.2 ug/g Trichloroethane ND 1.2 ug/g Trichloroethane ND 1.2 ug/g trans-1,2-Dichloroethane ND 1.2 ug/g chloroform ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g Garbon Tetrachloride ND 1.2 ug/g 1,2-Dichloropropane ND 1.2 ug/g 1,2-Dichloropropane ND 1.2 ug/g trans-1, 3-Dichloropropene ND 1.2 ug/g Trichloroethene (TCE) ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-T	Vinyl Chloride			ND		1.2	- m
Methylene Chloride ND 1.2 ug/g 1,1-Dichloroethene ND 1.2 ug/g Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g chloroform ND 1.2 ug/g chloroform ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g carbon Tetrachloride ND 1.2 ug/g gromodichloromethane ND 1.2 ug/g cis-1,3-Dichloropropane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g richloroethene (TCE) ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g Brom	Chloroethane			ND		1.2	
Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g trans-1,2-Dichloroethene ND 1.2 ug/g Chloroform ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g Carbon Tetrachloride ND 1.2 ug/g Bromodichloromethane ND 1.2 ug/g cis-1,3-Dichloropropane ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g Trichloroethene (TCE) ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,3-Dichlorobenzene ND 1.2 ug/g	Methylene Chloride			ND		1.2	
Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g trans-1,2-Dichloroethene ND 1.2 ug/g Chloroform ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g Carbon Tetrachloride ND 1.2 ug/g Bromodichloromethane ND 1.2 ug/g 1,2-Dichloroptopane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g Trichloroethene (TCE) ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,3-Dichlorobenzene ND 1.2 ug/g	1,1-Dichloroethene			ND		1.2	ug/g
trans-1,2-Dichloroethene ND 1.2 ug/g Chloroform ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g Carbon Tetrachloride ND 1.2 ug/g Bromodichloromethane ND 1.2 ug/g I,2-Dichloropropane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g Trichloroethane ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g Chlorobenzene ND 1.2 ug/g 1,3-Dichlorobenzene ND 1.2 ug/g 1	Trichlorofluorometha	ane		ND		1.2	
Chloroform ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g Carbon Tetrachloride ND 1.2 ug/g Bromodichloromethane ND 1.2 ug/g J,2-Dichloropropane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g Trichloroethane ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-Trichloroptopene ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 2-Chloroethylvinyl ether ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g Chlorobenzene ND 1.2 ug/g <td>1,1-Dichloroethane</td> <td></td> <td></td> <td>ND</td> <td></td> <td>1.2</td> <td></td>	1,1-Dichloroethane			ND		1.2	
1,2-Dichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g Carbon Tetrachloride ND 1.2 ug/g Bromodichloromethane ND 1.2 ug/g i,2-Dichloropropane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g Trichloroethene (TCE) ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 2-Chloroethylvinyl ether ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g 1,3-Dichlorobenzene ND 1.2 ug/g 1,3-Dichlorobenzene ND 1.2 ug/g 1,2-Dichlorobenzene ND 1.2 ug/g	trans-1,2-Dichloroet	thene		ND		1.2	ug/g
1,1,1-TrichloroethaneND1.2ug/gCarbon TetrachlorideND1.2ug/gBromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Chloroform			ND		1.2	ug/g
Carbon TetrachlorideND1.2ug/gBromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroetheneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,2-Dichloroethane			ND		1.2	ug/g
BromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,1,1-Trichloroetham	he		ND		1.2	ug/g
1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Carbon Tetrachloride			ND		1.2	ug/g
cis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Bromodichloromethane	=		ND		1.2	ug∕g
trans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,2-Dichloropropane			ND		1.2	ug∕g
Trichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	cis-1,3-Dichloroprop	oene		ND		1.2	ug∕g
DibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	trans-1,3-Dichlorop	ropene		ND		1.2	ug∕g
1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Trichloroethene (TCF	E)		ND		1.2	ug∕g
2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Dibromochloromethan	<u></u>		ND		1.2	ug∕g
BromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,1,2-Trichloroethad	ne		ND		1. 2	ug/g
1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	2-Chloroethylvinyl (ether		ND		1.2	ug∕g
Tetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g				ND		1.2	ug/g
ChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,1,2,2-Tetrachloro	ethane		ND		1.2	ug∕g
1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g		PCE)					ug/g
1,2-Dichlorobenzene ND 1.2 ug/g							ug∕g
¢/ 10							ug∕g
a di mana i su						1.2	ug∕g
1,4-Dichioropenzene ND 1.2 ug/g	1,4-Dichlorobenzene			ND		1.2	ug/g

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Client:	KW Brown	and Asso	ciates	Report Date:	06/30/89
Sample ID	14 77	Pit Nort	:h	Date Sampled:	06/13/89
Laborator	y Number:	C89034		Date Received:	06/16/89
Analysis	Requested:	8020		Date Extracted:	06/27/89
Sample Ma		Soil		Date Analyzed:	06/27/89
Preservat	ive:	Cool			
Condition	# (t	Appears	Good		
		· •		Det.	
Parameter			Concentration	Limit	Units
Benzene			ND	0.23	ug/g
Toluene			1.2	0.23	uq/q
Ethylbenz	ene		ND	0.23	ug/g
Chloroben	zene		ND	0.23	ug∕g
p,m-Xylen	e		15.6	0.23	ug/g
o-Xylene			2,2	0.23	ug/g
1,4 Dichl	orobenzene		ND	0.23	ug/g
1,3 Dichl	orobenzene		ND	0.23	ug/g
1.2 Dichl	orobenzene		ND	0.23	ug/g

ND - Parameter not detected at the stated detection limit.

Comments:

Aeviewed by

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:			ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/13/89 06/16/89 06/26/89 06/26/89
Parameter		Con	centration		Det. Limit	Units
Chloromethane			ND		0.70	ug/g
Bromomethane			ND		0.70	uq/q
Dichlorodifluoromet	hane		ND		0.70	ug/g
Vinyl Chloride			ND		0.70	uq/g
Chloroethane			ND		0.7Ŏ	ug/g
Methylene Chloride			ND		0.70	ug/g
1,1-Dichloroethene			ND		0.70	ug/g
Trichlorofluorometh	ane		ND		0.70	ug/g
1,1-Dichloroethane			ND		0.70	ug/g
trans-1,2-Dichloroe	thene		ND		0.70	ug/g
Chloroform			ND		0.70	ug/g
1,2-Dichloroethane			ND		0.70	ug/g
1,1,1-Trichloroetha	ne		ND		0.70	ug/g
Carbon Tetrachlorid	e		ND		0.70	ug/g
Bromodichloromethan	e		ND		0.70	ug∕g
1,2-Dichloropropane			ND		0.70	ug∕g
cis-1,3-Dichloropro	pene		ND		0.70	ug∕g
trans-1,3-Dichlorop			ND		0.70	ug∕g
Trichloroethene (TC	E)		ND		0.70	ug/g
Dibromochloromethan			ND		0.70	ug∕g
1,1,2-Trichloroetha			ND		0.70	ug∕g
2-Chloroethylvinyl	ether		ND:		0.70	ug∕g
Bromoform			ND		0.70	ug/g
1,1,2,2-Tetrachloro			ND		0.70	ug/g
Tetrachloroethene (PCE)		ND		0.70	ug/g
Chlorobenzene			ND		0.70	ug/g
1,3-Dichlorobenzene			ND		0.70	ug/g
1,2-Dichlorobenzene			ND		0.70	uġ/ġ
1,4-Dichlorobenzene			ND		0.70	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

 ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	Pit South C89035 8020 Soil Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	
Condition:	Appears Good	Det.	
Parameter	Concentration	Limit	Units
Benzene	ND	0.13	ug/g
Toluene	ND	0.13	ug∕g
Ethylbenzene	ND	0.13	ug∕g
Chlorobenzene	0.37	0.13	ug∕g
p,m-Xylene	0.76	0.13	ug/g
o-Xylene	ND	0.13	ug∕g
1,4 Dichlorobenzene	ND	0.13	ug/g
1,3 Dichlorobenzene	ND	0.13	ug/g
1,2 Dichlorobenzene	ND	0.13	ug/g

ND - Parameter not detected at the stated detection limit.

Comments:

Jack M. Morgan

Reviewed by

Organic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	Pit East C89036 Volatile Soil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/22/89 06/22/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	1.2	ug/g
Bromomethane		ND	1.2	ug/g
Dichlorodifluorometh	пале	ND	1.2	ug/g
Vinyl Chloride		ND	1.2	ug∕g
Chloroethane		ND	1.2	ug/g
Methylene Chloride		ND	1.2	ug∕g
1,l-Dichloroethene		ND	1.2	ug∕g
Trichlorofluorometh	ane	ND	1.2	ug∕g
1,1-Dichloroethane		ND	1.2	ug∕g
trans-1,2-Dichloroe	thene	ND	1.2	ug∕g
Chloroform		ND	1.2	ug/g
1,2-Dichloroethane		ND	1.2	ug∕g
1,1,1-Trichloroetha	ne	ND	1.2	ug/g
Carbon Tetrachlorid		ND	1.2	ug∕g
Bromodichloromethan		ND	1.2	ug∕g
1,2-Dichloropropane		ND	1.2	ug∕g
cis-1,3-Dichloroprop		ND	1.2	ug/g
trans-1,3-Dichlorop		ND	1.2	ug∕g
Trichloroethene (TC		ND	1.2	ug/g
Dibromochloromethan		ND	1.2	ug/g
1,1,2-Trichloroetha		ND	1.2	ug/g
2-Chloroethylvinyl (ether	ND	1.2	ug/g
Bromoform		ND	1.2	ug/g
1,1,2,2-Tetrachloro		ND	1.2	ug∕g
Tetrachloroethene (PCE)	ND	1.2	ug/g
Chlorobenzene		ND	1.2	ug∕g
1,3-Dichlorobenzene		ND	1.2	ug/g
1,2-Dichlorobenzene		ND	1.2	ug∕g
1,4-Dichlorobenzene		ND	1.2	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

M14 -

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	Pit East	Date Sampled:	06/13/89
Laboratory Number:	089036	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	
Sample Matrix:	Soil	Date Analyzed:	06/22/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Farameter	Concentration	Limit	Units
	where were allow and the state where were about these cours and a	where sense dense means anoth	
Benzene	ND	0.24	ug∕g
Toluene	ND	0.24	ug∕g
Ethylbenzene	ND	0.24	ug/g
Chlorobenzene	ND	0.24	ug/g
p,m-Xylene	1.6	0.24	ug/g
o-Xylene	0.5	∴ 24	ug/g
1,4 Dichlorobenzene	ND	0.24	ug/g
1,3 Dichlorobenzene	NID	0.24	ug/g
1,2 Dichlorobenzene	ND	0.24	ug∕g

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

IM back M. Morgan

Organic Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:		Halo	pcarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/13/89 06/16/89 06/27/89 06/27/89
Parameter		Cond	centration		Det. Limit	Units
Chloromethane			ND		0.62	ug/q
Bromomethane			ND		0.62	ua/g
Dichlorodifluoromet	hane		ND		0.62	ug/g
Vinyl Chloride			ND		0.62	ug∕g
Chloroethane			ND		0.62	ug/g
Methylene Chloride			ND		0.62	ug∕g
1,1-Dichloroethene			ND		0.62	ug/g
Trichlorofluorometh	ane		ND		0.62	ug∕g
1,1-Dichloroethane			ND		0.62	ug∕g
trans-1,2-Dichloroe	thene		ND		0.62	ug∕g
Chloroform			ND		0.62	ug∕g
1,2-Dichloroethane			ND		0.62	ug∕g
1,1,1-Trichloroetha			ND		0.62	ug/g
Carbon Tetrachlorid			ND		0.62	ug/g
Bromodichloromethan			ND		0.62	ug∕g
1,2-Dichloropropane			ND		0.62	ug∕g
cis-1,3-Dichloropro			ND		0.62	ug/g
trans-1,3-Dichlorop	•		ND		0.62	ug∕g
Trichloroethene (TC			ND		0.62	ug/g
Dibromochloromethan			ND		0.62	ug/g
1,1,2-Trichloroetha			ND		0.62	ug/g
2-Chloroethylvinyl	ether		ND		0.62	ug/g
Bromoform			ND		0.62	ug/g
1,1,2,2-Tetrachloro			ND		0.62	ug∕g
Tetrachloroethene (PCE)		ND		0.62	ug/g
Chlorobenzene			ND		0.62	ua∕g
1,3-Dichlorobenzene			ND		0.62	ug/g
1,2-Dichlorobenzene			ND		0.62	ug∕g
1,4-Dichlorobenzene			ND		0.62	ug/g

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Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit.

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by 'M

Client: KW Brow	n and Associates	Report Date:	06/30/89
Sample ID: Laboratory Number: Analysis Requested Sample Matrix: Preservative:	Pit West C89037 : 8020 Soil Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/13/89 06/16/89 06/27/89 06/27/89
Condition:	Appears Good	Det.	
Parameter	Concentration	Limit	Units
Benzene	2.6	0.12	ug∕g
Toluene	34.3	0.12	ug∕ġ
Ethylbenzene	ND	0.12	ug∕g
Chlorobenzene	ND	0.12	ug∕g
p,m-Xylene	152	0.12	ug∕g
o-Xylene	25.2	0.12	ug∕g
1,4 Dichlorobenzen	e ND	0.12	ug∕g
1,3 Dichlorobenzen	e ND	0.12	ug∕g
1,2 Dichlorobenzen	e ND	0.12	ug∕g

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

M/M-Jack M) Morgan Organic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T6-East C89038 Volatile Soil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/28/89 06/28/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	0.64	ug/g
Bromomethane		ND	0.64	ug∕g
Dichlorodifluorometh	nane	ND	Ö.64	ug∕g
Vinyl Chloride		ND	°.64	ug∕g
Chloroethane		ND	0.64	ug∕g
Methylene Chloride		ND)	6.4	ug∕g
1,1-Dichloroethene		ND	0.64	ug/g
Trichlorofluorometha	ane	ND	0.64	uq∕g
1,1-Dichloroethane		ND	0.64	ug/g
trans-1,2-Dichloroet	chene	ND	0.64	ug/g
Chloroform		ND	O.64	ug/g
1,2-Dichloroethane		ND	0.64	ug∕g
1,1,1-Trichloroethar	ne	ND	0.64	ug/g
Carbon Tetrachloride	5	ND	0.64	ug∕g
Bromodichloromethane	2	ND	0.64	ug/g
1,2-Dichloropropane		ND	0.64	ug∕g
cis-1,3-Dichloroprop	pene	ND	0.64	ug∕g
trans-1,3-Dichloropr		ND	0.64	ug/g
Trichloroethene (TCE		ND	0. 64	ug/g
Dibromochloromethane		ND	0.64	ug∕g
1,1,2-Trichloroethar	1 e	ND	Ŏ . 64	ug∕g
2-Chloroethylvinyl e	ether	ND	O.64	ug∕g
Bromoform		ND	O.64	ug∕g
1,1,2,2-Tetrachloroe	ethane	ND	0.64	ug∕g
Tetrachloroethene (F	PCE)	ND	0.64	ug∕g
Chlorobenzene		ND	0.64	ug∕g
1,3-Dichlorobenzene		ND	0.64	ug∕g
1,2-Dichlorobenzene		ND	O.64	ug∕g
1,4-Dichlorobenzene		ND	Õ.64	uq/q

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Remiewed by

MM

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	T6-East	Date Sampled:	06/15/89
Laboratory Number:	C89038	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/28/89
Sample Matrix:	Soil	Date Analyzed:	06/28/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Parameter	Concentration	Limit	Units
Benzene	ND	0.13	ug∕g
Toluene	ND	0.13	ug∕g
Ethylbenzene	ND	0.13	ug/g
Chlorobenzene	ND	0.13	ug∕g
p,m-Xylene	ND	0.13	ug∕g
o-Xyl e ne	ND	0.13	ug∕g
1,4 Dichlorobenzene	ND	0.13	ug∕g
1,3 Dichlorobenzene	ND	0.13	ug∕g
1,2 Dichlorobenzene	ND	0.13	ug∕g

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Arganic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T6-West C89039 Volatile Soil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/27/89 06/27/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	0.58	ug/g
Bromomethane		ND	0.5 8	ug/g
Dichlorodifluorometh	nane	ND	<i>o</i> .58	uq/g
Vinyl Chloride		ND	0.58	uq/q
Chloroethane		ND	0. 58	ug/g
Methylene Chloride		ND	0.58	uq/g
1,1-Dichloroethene		ND	0.58	uq/q
Trichlorofluorometha	ane	ND	0.58	ug/g
1,1-Dichloroethane		ND	0.58	uq/g
trans-1,2-Dichloroet	hene	ND	0.58	ug∕g
Chloroform		ND	0.58	ug/g
1,2-Dichloroethane		ND	0.58	ug/g
1,1,1-Trichloroethar	le	ND	0.58	ug/g
Carbon Tetrachloride	2	ND	0.58	ug/g
Bromodichloromethane	5	ND	0.58	ug/g
1,2-Dichloropropane		ND	0.58	ug/g
cis-1,3-Dichloroprop	pene	ND	0.58	ug∕g
trans-1,3-Dichloropr	opene	ND	0.58	ug/g
Trichloroethene (TCB	E)	ND	0.58	ug/g
Dibromochloromethane	D.	ND	0.58	ug∕g
1,1,2-Trichloroethar	1e	ND	0.58	ug/g
2-Chloroethylvinyl e	ether	ND	0.58	ug/g
Bromoform		ND	0.58	ug/g
1,1,2,2-Tetrachloroe	ethane	ND	0.58	ug/g
Tetrachloroethene (F	PCE)	ND	0.58	ug/g
Chlorobenzene		ND	0.58	ug/g
1,3-Dichlorobenzene		ND -	0.58	ug/g
1,2-Dichlorobenzene		ND	0.58	ug∕g
1,4-Dichlorobenzene		ND	0.58	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Freviewed by

Morgan Ack M.

Organid Analyst

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	T6-West	Date Sampled:	06/15/89
Laboratory Number:	C87039	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/27/89
Sample Matrix:	Soil	Date Analyzed:	06/27/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Farameter	Concentration	Limit	Units
Mana alam angar anya alam anan angar anan	regar wants dalls findly when balan when when the same and the same data		
Benzene	ND	0.12	ug∕g
Toluene	ND	Ŏ.12	ug∕g
Ethylbenzene	ND	0.12	ug∕g
Chlorobenzene	ND	0.12	ug∕g
p,m-Xylene	ND	0.12	ug/g
o-Xylene	ND	0.12	ug∕g
1,4 Dichlorobenzene	ND	0.12	ug/g
1,3 Dichlorobenzene	ND	0.12	ug∕g
1,2 Dichlorobenzene	ND	0.12	ug/g

Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

MAILA

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T7 C89040 Volatile Soil None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/29/89 06/29/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	0.71	ug/g
Bromomethane		ND	O.71	uq/g
Dichlorodifluoromet	hane	ND	0.71	ug/g
Vinyl Chloride		ND	0.71	ug/g
Chloroethane		ND	0.71	ug/g
Methylene Chloride		ND	7.1	ug/g
1,1-Dichloroethene		ND	0.71	ug/g
Trichlorofluorometh	ane	ND	0.71	ug∕g
1,1-Dichloroethane		ND	0.71	ug/g
trans-1,2-Dichloroe	thene	ND	0.71	ug/g
Chloroform		ND	0.71	ug/ g
1,2-Dichloroethane		ND	0.71	ug∕g
1,1,1-Trichloroetha		ND	0.71	ug∕g
Carbon Tetrachlorid		ND	O. 71	ug/g
Bromodichloromethan		ND	0.71	ug/g
1,2-Dichloropropane		ND	O., 71	ug/g
cis-1,3-Dichloropro		ND	0.71	ugZg
trans-1,3-Dichlorop		ND	0.71	ug/g
Trichloroethene (TC		ND	0.71	ug∕g
Dibromochloromethan		ND	0.71	uġ∕ġ
1,1,2-Trichloroetha		ND	0.71	ug∕g
2-Chloroethylvinyl	ether	ND	0.71	ug/g
Bromoform		ND	0.71	ug∕g
1,1,2,2-Tetrachloro		ND	0.71	ug/g
Tetrachloroethene (PUE)	ND	0.71	ug/g
Chlorobenzene		ND	0.71	ug/g
1,3-Dichlorobenzene		ND	0.71	ng∕g
1,2-Dichlorobenzene		ND	0.71	ug/g
1,4-Dichlorobenzene		ND	0.71	ug/g

Method:

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Иθ

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	T7 C89040 8020 Soil Cool Appears Good	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/29/89 06/29/89
Parameter	Concentration	Det. Limit	Units
Benzene Toluene Ethylbenzene Chlorobenzene p,m-Xylene o-Xylene 1,4 Dichlorobenzene 1,3 Dichlorobenzene 1,2 Dichlorobenzene	ND ND ND ND ND ND ND ND ND	0.14 0.14 0.14 0.14 0.14 0.14 0.14 0.14	ug/g ug/g ug/g ug/g ug/g ug/g ug/g

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

M. Morgan

Organic Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	RP1-A C89041 Volatile Soil None Cool	Halc	ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/15/89 06/16/89 06/28/89 06/28/89
					Det.	
Parameter		Cond	centration		Limit	Units
Chloromethane			ND		0.71	ug/q
Bromomethane			ND		0.71	ug/g
Dichlorodifluoromet	hane		ND		0.71	ug/g
Vinyl Chloride			ND		0.71	ug/g
Chloroethane			ND		0.71	ug∕g
Methylene Chloride			ND		0.71	ug∕g
1,1-Dichloroethene			ND		O.71	ug/g
Trichlorofluorometh	ane		ND		O.71	ug∕g
1,1-Dichloroethane			ND		O.71	ug∕g
trans-1,2-Dichloroe	thene		ND		0.71	ug∕g
Chloroform			ND		0.71	ug∕g
1,2-Dichloroethane			ND		0.71	ug∕g
1,1,1-Trichloroetha			ND		0.71	ug/g
Carbon Tetrachlorid			ND		O.71	nä∖ä
Bromodichloromethan	2		ND		0.71	ug∕g
1,2-Dichloropropane			ND		0.71	u <mark>a</mark> ∕a
cis-1,3-Dichloroprop			ND		0.71	ug∕g
trans-1,3-Dichlorop			ND		0.71	ug∕g
Trichloroethene (TC			ND		O.71	ug∕g
Dibromochloromethan			ND		0.71	ug∕g
1,1,2-Trichloroetha			ND		0.71	ug/g
2-Chloroethylvinyl (ether		ND		0.71	ug/g
Bromoform			ND		0.71	ug/g
1,1,2,2-Tetrachloro			ND		0.71	ug/g
Tetrachloroethene (H	PCE)		ND		0.71	ug∕g
Chlorobenzene			ND		0.71	ug∕g
1,3-Dichlorobenzene			ND		0.71	ug∕g
1,2-Dichlorobenzene			ND		0.71	ug∕g
1,4-Dichlorobenzene			ND		0.71	ug∕g
\$						

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

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ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by KMU1 -

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	Soil Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/28/89 06/28/89
Condition:	Appears Good	Det.	
Parameter	Concentration	Limit	Units
	annen aber minis jakis istels istels istels inter beste ander soller sitels jakis annen		
Benzene	ND	0.14	ug∕g
Toluene	ND	0.14	ug/g
Ethylbenzene	ND	0.14	ug/g
Chlorobenzene	ND	0.14	ug/g
p,m-Xylene	ND	0.14	ug∕g
o-Xylene	ND	0.14	ug/g
1,4 Dichlorobenzene	ND	0.14	ug/g
1,3 Dichlorobenzene	ND ND	O. 14	ug/g
1,2 Dichlorobenzene	ND	0.14	

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Sample ID:RP1-B C89042Date Sampled:06/15/89 06/16/89Laboratory Number:Volatile Halocarbons Sample Matrix:SoilDate Extracted:06/29/89Preservative:NoneDate Analyzet:06/29/89ConcentrationCoolDet.ParameterConcentrationLinitUnitsChloromethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gChloroethane4.31.2ug/gMethylene ChlorideND1.2ug/gTrans-1,2-DichloroethaneND1.2ug/g1,1-DichloroethaneND1.2ug/g1,1-DichloroethaneND1.2ug/g1,1-DichloroethaneND1.2ug/g1,1-DichloroethaneND1.2ug/g1,1-DichloroethaneND1.2ug/g1,1-DichloroethaneND1.2ug/g1,2-DichloroethaneND1.2ug/g1,2-DichloroethaneND1.2ug/g1,2-DichloroethaneND1.2ug/g1,2-DichloropropaneND1.2ug/g1,2-DichloropropaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g1,1,2-TrichloropropaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g1,1,2-TrichloroethaneND<	Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
ParameterConcentrationLimitUnitsChloromethaneND1.2ug/gBromomethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gVinyl ChlorideND1.2ug/gChloroethane4.31.2ug/gMethylene ChlorideND1.2ug/gTrichloroethaneND1.2ug/g1.1-DichloroethaneND1.2ug/gtrans-1,2-DichloroethaneND1.2ug/gtrans-1,2-DichloroethaneND1.2ug/gchloroformND1.2ug/gchloroformND1.2ug/gcarbon TetrachlorideND1.2ug/ggromodichloromethaneND1.2ug/gcarbon TetrachlorideND1.2ug/ggris-1, 3-DichloropropeneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloropropeneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2 <td>Laboratory Number: Analysis Requested: Sample Matrix: Preservative:</td> <td>C89042 Volatile Soil None</td> <td>Halc</td> <td>carbons</td> <td>Date Date</td> <td>Received: Extracted:</td> <td>06/16/89 06/29/89</td>	Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	C89042 Volatile Soil None	Halc	carbons	Date Date	Received: Extracted:	06/16/89 06/29/89
ChloromethaneND1.2ug/gBromomethaneND1.2ug/gDichlorodifluoromethaneND1.2ug/gVinyl ChlorideND1.2ug/gChloroethaneA.31.2ug/gMethylene ChlorideND12.3ug/gIDichloroethaneND1.2ug/gTrichlorofluoromethaneND1.2ug/gtrans=1,2-DichloroetheneND1.2ug/gtrans=1,2-DichloroetheneND1.2ug/gtrans=1,2-DichloroetheneND1.2ug/gtrans=1,2-DichloroethaneND1.2ug/gtrans=1,2-DichloroethaneND1.2ug/gtrans=1,3-DichloroethaneND1.2ug/gtrans=1,3-DichloropropeneND1.2ug/gtrichloropropaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloropropaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gtrichloroethane <td>Farameter</td> <td></td> <td></td> <td></td> <td></td> <td>Limit</td> <td></td>	Farameter					Limit	
Bromomethane ND 1.2 ug/g Dichlorodifluoromethane ND 1.2 ug/g Vinyl Chloride ND 1.2 ug/g Chloroethane 4.3 1.2 ug/g Methylene Chloride ND 1.2 ug/g Inthrop Chloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g 1,2-Dichloropropane ND 1.2 ug/g 1,2-Dichloropropane ND 1.2 ug/g 1,2-Dichloropropene ND 1.2 ug/g 1,2-Dichloropropene ND 1.2 ug/g 1,1,2-Trichloroeth	Chloromethane						
DichlorodifluoromethaneND1.2ug/gVinyl ChlorideND1.2ug/gChloroethane4.31.2ug/gMethylene ChlorideND12.3ug/g1,1-DichloroetheneND1.2ug/gTrichlorofluoromethaneND1.2ug/gtrans-1,2-DichloroetheneND1.2ug/gchloroformND1.2ug/g1,1-TrichloroethaneND1.2ug/gtrans-1,2-DichloroethaneND1.2ug/g1,2-DichloroethaneND1.2ug/g1,1-TrichloroethaneND1.2ug/gcarbon TetrachlorideND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gtrichloroethaneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gfrichloroethaneND1.2ug/gtrichloroethaneND1.2ug/gfrichloroethaneND1.2ug/gfrichloroethene (TCE)ND1.2ug/gfrichloroethaneND1.2ug/gfrichloroethaneND1.2ug/gg1,1,2-TrichloroethaneND1.2ug/gfrichloroethaneND1.2ug/gfrichloroethaneND1.2ug/gg1,1,2,2-TetrachloroethaneND1							
Vinyl Chloride ND 1.2 ug/g Chloroethane 4.3 1.2 ug/g Methylene Chloride ND 12.3 ug/g 1,1-Dichloroethene ND 1.2 ug/g Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethene ND 1.2 ug/g trans-1,2-Dichloroethene ND 1.2 ug/g chloroform ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g Carbon Tetrachloride ND 1.2 ug/g Bromodichloromethane ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g trans-1,2-Trichloroethane ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g trans-1,2-Trichloroethane ND 1.2 ug/g <td></td> <td>hane</td> <td></td> <td></td> <td></td> <td></td> <td></td>		hane					
Chloroethane 4.3 1.2 ug/g Methylene Chloride ND 12.3 ug/g 1,1-Dichloroethene ND 1.2 ug/g Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g chloroform ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g Garbon Tetrachloride ND 1.2 ug/g 1,2-Dichloropropane ND 1.2 ug/g i,2-Dichloropropane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g richloroethene (TCE) ND 1.2 ug/g Ji,1,2-Trichloroethane ND 1.2 ug/g 2-Chlor							10 11:
Methylene Chloride ND 12.3 ug/g 1,1-Dichloroethene ND 1.2 ug/g Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g trans-1,2-Dichloroethane ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1-Trichloroethane ND 1.2 ug/g Carbon Tetrachloride ND 1.2 ug/g Bromodichloropropane ND 1.2 ug/g cis-1,3-Dichloropropane ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 2-Chloroethylvinyl ether ND 1.2 ug/g </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
1,1-Dichloroethene ND 1.2 ug/g Trichlorofluoromethane ND 1.2 ug/g 1,1-Dichloroethane ND 1.2 ug/g trans-1,2-Dichloroethene ND 1.2 ug/g Chloroform ND 1.2 ug/g 1,2-Dichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g 1,1,1-Trichloroethane ND 1.2 ug/g Carbon Tetrachloride ND 1.2 ug/g Bromodichloromethane ND 1.2 ug/g i,2-Dichloropropane ND 1.2 ug/g cis-1,3-Dichloropropene ND 1.2 ug/g trans-1,3-Dichloropropene ND 1.2 ug/g Trichloroethene (TCE) ND 1.2 ug/g Dibromochloromethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2-Trichloroethane ND 1.2 ug/g 1,1,2,2-Tetrachloroethane ND 1.2 ug/g							
TrichlorofluoromethaneND1.2ug/g1,1-DichloroethaneND1.2ug/gtrans-1,2-DichloroetheneND1.2ug/gChloroformND1.2ug/g1,2-DichloroethaneND1.2ug/g1,1-TrichloroethaneND1.2ug/gCarbon TetrachlorideND1.2ug/gBromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethaneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethaneND1.2ug/gtrans-1,2-TrichloroethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-Dichlorobenzene <t< td=""><td>1,1-Dichloroethene</td><td></td><td></td><td>ND</td><td></td><td>1.2</td><td></td></t<>	1,1-Dichloroethene			ND		1.2	
1,1-DichloroethaneND1.2ug/gtrans-1,2-DichloroetheneND1.2ug/gChloroformND1.2ug/g1,2-DichloroethaneND1.2ug/g1,1-TrichloroethaneND1.2ug/gCarbon TetrachlorideND1.2ug/gBromodichloromethaneND1.2ug/gcis-1,3-DichloropropaneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethaneND1.2ug/g1,2-TrichloroethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichloropeneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND <td>•</td> <td>ane</td> <td></td> <td></td> <td></td> <td>1.2</td> <td></td>	•	ane				1.2	
trans-1,2-DichloroetheneND1.2ug/gChloroformND1.2ug/g1,2-DichloroethaneND1.2ug/g1,1,1-TrichloroethaneND1.2ug/gCarbon TetrachlorideND1.2ug/gBromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND<	1,1-Dichloroethane			ND		1.2	
1,2-DichloroethaneND1.2ug/g1,1,1-TrichloroethaneND1.2ug/gCarbon TetrachlorideND1.2ug/gBromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,3-Dichlorobenzene		thene		ND		1.2	ug/g
1,1,1-TrichloroethaneND1.2ug/gCarbon TetrachlorideND1.2ug/gBromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,3-Dichlorobenzene <td>Chloroform</td> <td></td> <td></td> <td>ND</td> <td></td> <td>1.2</td> <td>ug/g</td>	Chloroform			ND		1.2	ug/g
Carbon TetrachlorideND1.2ug/gBromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,2-Dichloroethane			ND		t.2	ug/g
BromodichloromethaneND1.2ug/g1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,1,1-Trichloroethar	ne		ND		1.2	ug/g
1,2-DichloropropaneND1.2ug/gcis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Carbon Tetrachloride	<u> </u>		ND		1.2	ug/g
cis-1,3-DichloropropeneND1.2ug/gtrans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Bromodichloromethane	2		ND		1.2	ug/g
trans-1,3-DichloropropeneND1.2ug/gTrichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,2-Dichloropropane			ND			ug/g
Trichloroethene (TCE)ND1.2ug/gDibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	cis-1,3-Dichloroprop	oene		ND		1.2	ug/g
DibromochloromethaneND1.2ug/g1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	trans-1,3-Dichlorop	ropene		ND		1.2	ug∕g
1,1,2-TrichloroethaneND1.2ug/g2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Trichloroethene (TCF	Ξ)		ND			ug/g
2-Chloroethylvinyl etherND1.2ug/gBromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Dibromochloromethane	÷		ND		1.2	ug∕g
BromoformND1.2ug/g1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	1,1,2-Trichloroethar	ne		ND		1.2	ug∕g
1,1,2,2-TetrachloroethaneND1.2ug/gTetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	2-Chloroethylvinyl e	ether		ND			ug∕g
Tetrachloroethene (PCE)ND1.2ug/gChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g	Bromoform			ND		1.2	ug∕g
ChlorobenzeneND1.2ug/g1,3-DichlorobenzeneND1.2ug/g1,2-DichlorobenzeneND1.2ug/g				ND			ug∕g
1,3-Dichlorobenzene ND 1.2 ug/g 1,2-Dichlorobenzene ND 1.2 ug/g	Tetrachloroethene (F	PCE)					ug∕g
1,2-Dichlorobenzene ND 1.2 ug/g				ND			ug/g
							ug/g
	-			ND			ug∕g
աւց ք աստուստես ք աստումուն աստում համ հանկով ք կով	1,4-Dichlorobenzene			ND		1.2	ug/g

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Freviewed by

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	RP1-B	Date Sampled:	06/15/89
Laboratory Number:	C89042	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/29/89
Sample Matrix:	Soil	Date Analyzed:	06/29/89
Freservative:	Cool		
Condition:	Appears Good		
		Det.	
Parameter	Concentration	Limit	Units
Benzene	ND	0.25	uq/g
Toluene	ND	0.25	uq/g
Ethylbenzene	ND	0.25	ug/g
Chlorobenzene	ND	0.25	uq/q
p,m-Xylene	ND	0.25	ug/g
o-Xylene	ND	0.25	ug/g
1,4 Dichlorobenzene	ND	0.25	ug/g
1,3 Dichlorobenzene	ND	0.25	ug∕g
1,2 Dichlorobenzene	ND	0.25	uo/g

ND - Parameter not detected at the stated detection limit.

Comments:

Raviewed by

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	RP2 C89043 Volatile Soil None Cool	Halo	carbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/15/89 06/16/89 06/29/89 06/29/89
Parameter		Conc	entration		Det. Limit	Units
Chloromethane Bromomethane Dichlorodifluorometh Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene Trichlorofluorometha 1,1-Dichloroethane trans-1,2-Dichloroet Chloroform 1,2-Dichloroethane 1,1,1-Trichloroethane	ine :hene ie		ND ND ND ND ND ND ND ND ND ND ND ND ND		1 . 1 1 . 1	ug/g ug/g ug/g ug/g ug/g ug/g ug/g ug/g
Carbon Tetrachloride Bromodichloromethane 1,2-Dichloropropane cis-1,3-Dichloroprop trans-1,3-Dichloroprop Trichloroethene (TCE Dibromochloromethane 1,1,2-Trichloroethane 2-Chloroethylvinyl e Bromoform 1,1,2,2-Tetrachloroe Tetrachloroethene (F Chlorobenzene 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene	ene opene) e ether ethane		ND ND ND ND ND ND ND ND ND ND ND ND ND N		1 - 1 $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$ $1 - 1$	na/a na/a na/a na/a na/a na/a na/a na/a

Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

F@viewed by

Client:	KW Brown	and	Associates	Report Date:	06/30/89
Sample ID	ц п	RP2		Date Sampled:	06/15/89
Laborator	•	C890	043	Date Received:	06/16/89
Analysis	Requested:	8020)	Date Extracted:	06/29/89
Sample Ma	tri×:	Soil	L	Date Analyzed:	06/29/89
Preservat	i∨e:	Cool	l.		
Condition	n n	Appe	ears Good		
				Det.	
Parameter			Concentration	L.imit.	Units
Benzene			ND	0.23	ug∕g
Toluene			ND	0,23	ug/g
Ethylbenz	ene		ND	0.23	ug∕g
Chloroben	zene		ND	0.23	ug∕g
p,m-Xylen	e		ND	0.23	ug∕g
o-Xylene			ND	0.23	ug∕g
1,4 Dichl	orobenzene		ND	0.23	ug∕g
1,5 Dichi	orobenzene		ND	0.23	ug∕g

ND - Parameter not detected at the stated detection limit.

Comments:

Jack M. Morgan Organic Analyst

Reviewed by

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	BG-1 C89044 Volatile Soil None Cool	Halo	ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/15/89 06/16/89 06/28/89 06/28/89
Parameter		Cond	entration		Det. Limit	Units
Chloromethane			ND		0.60	ug∕g
Bromomethane			ND		0.60	ug∕g
Dichlorodifluoromet	nane		ND		0.60	ug∕g
Vinyl Chloride			ND		0.60	ug∕g
Chloroethane			ND		0.60	ug/g
Methylene Chloride			ND		0.60	ug∕g
1,1-Dichloroethene			ND		0.60	ug∕g
Trichlorofluorometha	ane ²		ND		0.60	ug∕g
1,1-Dichloroethane			ND		0.60	ug/g
trans-1,2-Dichloroe	thene		ND		0.60	ug∕g
Chloroform			ND		0.60	ug/g
1,2-Dichloroethane			ND		0.60	uq∕g
1,1,1-Trichloroetha			ND		0.60	ug/g
Carbon Tetrachlorid			ND		0.60	ua∕a
Bromodichloromethan	5		ND		0.60	ug∕g
1,2-Dichloropropane			0.61		0.60	ug∕g
cis-1,3-Dichloropro			ND		0.60	ug/g
trans-1,3-Dichlorop			ND		0.60	ug∕g
Trichloroethene (TC			ND		0.60	ug/g
Dibromochloromethan			ND		0.60	uq∕g
1,1,2-Trichloroetha			ND		0.60	ug/g
2-Chloroethylvinyl (ether		ND		0.60	ug/g
Bromoform			ND		0.60	ug/g
1,1,2,2-Tetrachloro			ND		0.60	ug/g
Tetrachloroethene (PCE)		ND		0.60	ug/g
Chlorobenzene			ND		0.60	ug/g
1,3-Dichlorobenzene			ND		0.60	ug∕g
1,2-Dichlorobenzene			ND		0.60	ug/g
1,4-Dichlorobenzene			ND		0.60	ug/g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Client: KW Brown	and Associates	Report Date:	06/30/89
Sample ID:	BG-1	Date Sampled:	06/15/89
Laboratory Number:	C89044	Date Received:	06/16/89
Analysis Requested:	8020	Date Extracted:	06/28/89
Sample Matrix:	Soil	Date Analyzed:	06/28/89
Preservative:	Cool		
Condition:	Appears Good		
		Det.	
Parameter	Concentration	Limit	Units
	Mart Santa antes err a mere santa sama antes attas attas attas attas attas		
Benzene	ND	0.12	ug∕g
Toluene	ND	0.12	ug∕g
Ethylbenzene	ND	0.12	ug∕g
Chlorobenzene	ND	0.12	ug∕g
p,m-Xylene	ND	0.12	ug/g
o-Xylene	ND	0.12	ug/g
1,4 Dichlorobenzene	ND	0.12	ug/g
1,3 Dichlorobenzene	ND	0.12	ug/g
1,2 Dichlorobenzene	ND	0.12	ug∕g



ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

**** QUALITY ASSURANCE REPORT** MATRIX SPIKE Client: KW Brown and Associates Report Date: Sample ID: T5Date Sampled: Laboratory Number: C89033 Date Received: Analysis Requested: 8010 Date Extracted: 06/26/89 Sample Matrix: Soil Date Analyzed: Preservative: Cool Condition: Appears Good

	Spike	Sample	Spiked	Percent
Farameter	Added	Result	Sample	Recovery
Chloroform	9.67	ND	9.87	102
1,2-Dichloroethane	9.67	ND	9.23	95.5
1,2-Dichloropropane	9.67	ND	7.70	78.5
1,1,2,2-Tetrachloroethane	9.67	ND	8.47	87.6

07/07/89

06/13/89

06/16/89

06/26/89

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/g.

Reviewed by

** QUALITY ASSURANCE REPORT MATRIX SPIKE

Client: KW Brown and Associates

Report Date: 06/30/89

Sample ID:T5Laboratory Number:C89033Analysis Requested:8020Sample Matrix:SoilPreservative:CoolCondition:Appears Good

 Date
 Sampled:
 06/13/89

 Date
 Received:
 06/16/89

 Date
 Extracted:
 06/26/89

 Date
 Analyzed:
 06/26/89

Parameter	Spike Added	Sample Result	Spiked Sample Result	Percent Recovery
			anang bir a salat teate again basis teate tean teate teate and teate and teater	
Benzene	9.67	ND	8.69	89.9
Toluene	9.67	ND	8.67	89.7
Ethylbenzene	9.67	ND	9.12	94.3
Chlorobenzene	9.67	ND	9.07	93.8

Method:

Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/g.

Reviewed by

** QUALITY ASSURANCE REPORT MATRIX SPIKE

Client: KW Brown and Associates

Pit-North

Appears Good

089034

Soil

Cool

Date Sampled: 06/13/89 Date Received: 06/16/89 Date Extracted: 06/26/89 Date Analyzed: 06/26/89

06/30/89

Report Date:

Parameter	Spike Added	Sample Result	Spiked Sample Result	Fercent Recovery
Benzene	14.3	ND	13.2	92.3
Toluene	14.3	1.2	14.7	94.6
Ethylbenzene	14.3	ND	14.5	108
Chlorobenzene	14.3	ND	14.1	98.6

Method:

Sample ID:

Condition:

Laboratory Number:

Sample Matrix:

Preservative:

Analysis Requested: 8020

Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/g.

Regiewed by

Mack M. Morgan

Organic Analyst

** QUALITY ASSURANCE MATRIX SPIKE	E REPORT	Report I)ate:	06/30/89	
Client: KW Brown	and Ass	ociates			
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	RP1-A C89041 8010 Soil Cool Appears	Good	Date Sar Date Rec Date Ex1 Date Ana	reived:	06/15/89 06/16/89 06/28/89 06/28/89
Parameter		Spike Added	Sample Result	Spiked Sample	Percent Recovery
trans-1,2-Dichloroet 1,2-Dichloroethane Trichloroethene (TCH Tetrachloroethene (H	E)	8.82 8.82 8.82 8.82	ND ND ND ND	8.47 9.07 7.43 8.72	96.0 103 88.3 98.8

Method 8010, Halogenated Volatile Organics, SW-846, USEPA Method: (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/g.

Reviewed by

Jack M. Morgan Organiz Analyst
** QUALITY ASSURANC MATRIX SPIKE	E REPORT		Report Date:	06/30/89
Client: KW Brown	and Asso	ciates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	RP1-A C89041 8020 Soil Cool Appears	Good	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/15/89 06/16/89 06/28/89 06/28/89
Farameter	Spike Added	Sample Result	Spiked Sample Result	Fercent Recovery
Benzene Toluene Ethylbenzene Chlorobenzene	8.82 8.82 8.82 8.82	ND ND ND ND	7.76 7.81 8.10 8.00	87.9 88.6 91.4 90.7

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Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/g.

Reviewed by

METHOD BLANK	E NEFONI					
Client: Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	NA NA		Associates ocarbons	Date Date Date	t Date: Sampled: Received: Extracted: Analyzed:	NA NA NA 06/28/89 06/28/89
Parameter		Con	entration		Det. Limit	Units
Chloromethane			ND		1.0	ug/1
Bromomethane			ND		1.0	ug/1
Dichlorodifluoromet	hane		ND		1.0	ug/l
Vinyl Chloride			ND		1.0	ug/l
Chloroethane			ND		1.0	ug/l
Methylene Chloride			ND		1.0	ug/l
1,1-Dichloroethene			ND		1.0	ug/1
Trichlorofluorometh	ane		ND		1.0	uq/l
1.1-Dichloroethane			ND		1.0	ug/l
trans-1,2-Dichlorce	thene		ND		1.0	ug/1
Chloroform			ND		1.0	uq/l
1,2-Dichloroethane			ND		1.0	ug/l
1,1,1-Trichloroetha	ne		ND		1.0	ug/1
Carbon Tetrachlorid			ND		1.0	ug/l
Bromodichloromethan			ND		1.0	ug/l
1,2-Dichloropropane			ND		1.0	ug/l
cis-1,3-Dichloropro	pene		ND		1.0	ug/l
trans-1,3-Dichlorop	ropene		ND		1.0	uğ/l
Trichloroethene (TC	E)		ND		1.0	ug/l
Dibromochloromethan	<u>p</u>		ND		1.0	ug/l
1,1,2-Trichloroetha	ne		ND		1.0	ug/l
2-Chloroethylvinyl	ether		ND		1.0	ug/1
Bromoform			ND		1 " O	ug/l
1,1,2,2-Tetrachloro	ethane		ND		i. O	ug/1
Tetrachloroethene (PCE)		ND		1.0	ug/l
Chlorobenzene			ND		1.0	ug/l
1,3-Dichlorobenzene			ND		t .O	ug/l
1,2-Dichlorobenzene			ND		1.0	ug/l
1,4-Dichlorobenzene			ND		1.0	ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Jack M. Morgan Organic Analyst

** QUALITY ASSURANCE REPORT

** QUALITY ASSURANCE REPORT METHOD BLANK

Client: KW Brown Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	and Associates NA NA 8020 NA NA NA	Report Date: Date Sampled: Date Received: Date Extracted: Date Analyzed:	
1 7% 1		Det.	
Parameter	Concentration	Limit	Units
		annan upper valet an - a soular	
Benzene	ND	0.2	ug/l
Toluene	ND	0.2	ug/l
Ethylbenzene	ND	0.2	ug/l
Chlorobenzene	ND	0.2	uq/l
p,m-Xylene	ND	0.2	ug/l
o-Xylene	ND	0.2	uq/l
1,4 Dichlorobenzene	ND	0.2	ug/l
1.3 Dichlorobenzene	ND	0.2	uq/l
1,2 Dichlorobenzene	ND	0.2	ug/l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

xMM Jack M. Morgan Drganic Analyst

** QUALITY ASSURANCE METHOD BLANK	REPORT			
Sample ID:	KW Brown NA NA	and Associates	Report Date: Date Sampled: Date Received:	NA NA NA
Analysis Requested: Sample Matrix:	Volatile NA NA NA	Halocarbons	Date Extracted: Date Analyzed:	06/29/89 06/29/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	1.0	ua/1
Bromomethane		ND	1.0	uq/1
Dichlorodifluorometh	ane	ND	1.0	ug/l
Vinyl Chloride		ND	1.0	ug∕1
Chloroethane		ND	1.0	ug/l
Methylene Chloride		ND	1.0	ug/l
1,1-Dichloroethene		ND	1.0	ug/l
Trichlorofluorometha	ne	ND	1.0	ug/l
1,1-Dichloroethane		ND	1.0	ug/l
trans-1,2-Dichloroet	.hene	ND	1.O	ug∕l
Chloroform		ND	1.0	ug/l
1,2-Dichloroethane		ND	1 . O	ug∕l
1,1,1-Trichloroethan		ND	1.0	ug/1
Carbon Tetrachloride		ND	1.0	uq/l
Bromodichloromethane	•	ND	1.0	ug∕l
1,2-Dichloropropane		ND	1.0	ug∕1
cis-1,3-Dichloroprop		ND	1.0	ug∕l
trans-1,3-Dichloropr	•	ND	1.0	ug∕1
Trichloroethene (TCE		ND	1.0	ug∕l
Dibromochloromethane		ND	1.0	ug/l
1,1,2-Trichloroethan		ND	1.0	ug/l
2-Chloroethylvinyl e	ther	ND	1.0	ug/l
Bromoform		ND	1.0	ug/l
1,1,2,2-Tetrachloroe		ND	1.0	ug/1
Tetrachloroethene (F	'CE)	ND	1.0	ug/l
Chlorobenzene		ND	1.0	ug/l
1,3-Dichlorobenzene		ND	1.0	ug/l
1,2-Dichlorobenzene		ND	1.0	ug/l
1,4-Dichlorobenzene		ND	i .O	ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit.

Reviewed by áčk M, Morgan Organic Analyst

** QUALITY ASSURANCE REPORT METHOD BLANK

Client: KW Brown Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	and Associates NA NA 8020 NA NA NA	Report Date: Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/30/89 NA NA 06/29/89 06/29/89
		Det.	
Parameter	Concentration	Limit	Units
	ND	0.2	
Benzene			ug/l
Toluene	ND	0.2	ug/l
Ethylbenzene	ND	0.2	ug/l
Chlorobenzene	ND	0.2	ug∕l
p,m-Xylene	ND	0.2	ug∕l
o-Xylene	ND	Ŏ.2	ug/l
1,4 Dichlorobenzene	ND	0.2	ug/l
1,3 Dichlorobenzene	ND	0.2	ug∕1
1,2 Dichlorobenzene		0.2	uğ∕1

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by Jack M. Morgan Orbanic Analyst

** QUALITY ASSURANCE REPORT MATRIX DUPLICATE

Client: KW Brown	and Associates	Report Date:	06/30 /89
•	T3-Center	-	06/13/89
Laboratory Number:	C89028	Date Received:	06/16/89
Analysis Requested:	8010	Date Extracted:	06/26/89
Sample Matrix:	Soil	Date Analyzed:	06/26/89
Preservative:	Cool		
Condition:	Appears Good		

Parameter	Concentration	Det. Limit	Units
Chloromethane	NJ	0.59	ua/a
Bromomethane	ND	0.59	ug/g
Dichlorodifluoromethane	ND	0.59	ug/g
Vinyl Chloride	ND	0.59	uq/g
Chloroethane	ND	0.59	ug/g ug/g
Methylene Chloride	ND	0.59	uq/g
Trichlorofluoromethane	ND	0.59	ug/g
1,1-Dichloroethene	ND	0.59	ug/g
1,1-Dichloroethane	ND	0.59	ug/g
trans-1,2-Dichloroethene	ND	0.59	uq/g
Chloroform	ND	0 . 59	ug/g
1,2-Dichloroethane	ND	0. 59	uq/q
1,1,1-Trichloroethane	ND	0.59	uq/g
Carbon Tetrachloride	ND	0.59	ug/g
Bromodichloromethane	ND	0.59	ug/g
1,2-Dichloropropane	ND	0.59	ug/g
Trichloroethene (TCE)	ND	0.59	ug/g
cis-1,3-Dichloropropene	ND	0.59	uq/g
trans-1,3-Dichloropropene	ND	0.59	ug/g
Dibromochloromethane	ND	0.59	uā/g
1,1.2-Trichloroethane	ND	0.59	ug/g
2-Chloroethylvinyl ether	ND	0.59	ug/g
Bromoform	ND	0.59	ug/g
1,1,2,2-Tetrachloroethane	ND	0.59	ug∕g
Tetrachloroethene (PCE)	ND	0.59	ndia
Chlorobenzene	ND	0.59	ug∕g
1,3-Dichlorobenzene	ND	0.59	ug/g
1,2-Dichlorobenzene	ND	0.59	ug/g
1,4-Dichlorobenzene	ND	0.59	ug∕g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEFA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by ack M. Morgan, Organic Analyst

** QUALITY ASSURANCE REPORT MATRIX DUPLICATE

Client: KW Brown	and Associates	Report Date: 0	06/30/89
Sample ID:	T3-Center	Date Sampled: (06/13/89
Laboratory Number:	C89028	Date Received: (06/16/89
Analysis Requested:	8020	Date Extracted: (06/26/89
Sample Matrix:	Soil	Date Analyzed: (06/26/89
Freservative:	Cool		
Condition:	Appears Good		
		Det.	

Farameter	Concentration	Limit	Units
tani and diffe and diffe and and and and			
Benzene	ND	0.12	ug∕g
Toluene	ND	0.12	ug∕g
Ethylbenzene	ND	0.12	ug∕g
Chlorobenzene	0.14	O.12	ug∕g
p,m-Xylene	ND	0.12	ug/g
o-Xylene	ND	0.12	ug∕g
1,4 Dichlorobenzene	ND	0.12	ug∕g
1,3 Dichlorobenzene	ND	0.12	ug∕g
1,2 Dichlorobenzene	ND	0.12	ug/g

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Remiewed by

Jack M. Horgan Drganic Analyst

** QUALITY ASSURANCE REPORT FIELD DUPLICATE

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID:	BG-1		Date Sampled:	06/15/89
Laboratory Number:	C89051		Date Received:	06/16/89
Analysis Requested:	Volatile	Halocarbons	Date Extracted:	06/28/89
Sample Matrix:	Soil		Date Analyzed:	06/28/89
Preservative:	None			
Condition:	Cool			

Parameter	Concentration	Det. Limit	Units
Chloromethane	ND)	0.60	uq/a
Bromomethane	ND	0,60	uğ∕g
Dichlorodifluoromethane	ND	0 . 60	ug/g
Vinyl Chloride	ND	0.60	ug/g
Chloroethane	ND	0.60	ug/g
Methylene Chloride	ND	0.60	ug∕g
1,1-Dichloroethene	ND	0.60	ug/g
Trichlorofluoromethane	ND	0.60	ug/g
1,1-Dichloroethane	ND	0.60	ug/g
trans-1,2-Dichloroethene	ND	0,60	ug∕g
Chloroform	ND	0.60	ug∕g
1,2-Dichloroethane	ND	0.60	ug∕g
1,1,1-Trichloroethane	ND	0.60	ug/g
Carbon Tetrachloride	ND	0.60	ug/g
Bromodichloromethane	ND	0.60	ug/g
1,2-Dichloropropane	ND	0.60	ug∕g
cis-1,3-Dichloropropene	ND	0.60	ug/ g
trans-1,3-Dichloropropene	ND	0.60	ug∕g
Trichloroethene (TCE)	ND	0.60	ug∕g
Dibromochloromethane	ND	0.60	ug∕g
1,1,2-Trichloroethane	ND	0.60	ug∕g
2-Chloroethylvinyl ether	ND	0.60	ug∕g
Bromoform	ND	0.60	ug∕g
1,1,2,2-Tetrachloroethane	ND	0.60	ug∕g
Tetrachloroethene (PCE)	ND	0.60	ug∕g
Chlorobenzene	ND	0.60	ug∕g
1,3-Dichlorobenzene	ND	0.60	ug/g
1,2-Dichlorobenzene	ND	0.60	ug/g
1,4-Dichlorobenzene	ND	0.60	ug∕g

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

RAviewed by

FIELD DUPLICATE		•	
Client: KW Brown Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	and Associates B5-1 C89044 8020 Soil Cool Appears Good	Report Date: Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/30/89 06/15/89 06/16/89 06/28/89 06/28/89
Parameter	Concentration	Det. Limit	Units
	Magne prove states many later states for a state state state state state states		
Benzene	ND	0.12	ug∕g
Toluene	ND	0.12	ug∕g
Ethylbenzene	ND	0.12	ug∕g
Chlorobenzene	ND	0.12	ug∕g
p,m-Xylene	ND	O.1⊇	ug/ g
o-Xylene	ND	0.12	ug∕g
1,4 Dichlorobenzene	ND	0.12	ug∕g
1,3 Dichlorobenzene	ND	0.12	ug∕g
1,2 Dichlorobenzene	ND	0.12	ug∕g

Method:

: Method 8020, Aromatic Volatile Organics, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

** QUALITY ASSURANCE REPORT

APPENDIX H Analytical Data - Water

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Inter-Mountain Laboratories, Inc.

College Station, TX 77840

Route 3, Box 256

Tel. (409) 776-8945

Login - 8907003	2	water	~~~~		К. Ч.	BROWN & ASSOCIATES, INC.	SSOCIATE	S, INC.						Pag	Page: 1 of 2
P.O. # - 25603					Project:	: EPNG FLORA VISTA - 63712	RA VISTA	- 6371	12						7/18/89
Lab # Location	S.u.	uahos/ca	TDS, 180c mg/1	TDS, Calc. mg/l	DS, Total Oil& Ic. SAR ALK Grease, Sulfite g/l mg/l mg/l	Total ALK mg/l	0il & Grease, mg/l		Sulfite mg/l	Sulfide mg/l	HCO3 09/1	CO3 mg/1	Chloride mg/l	Sulfate mg/l	e Calciuna I ng/l
89052 EPN6 - 1		2120		1630		313	2.0	· · 0	2		382			======================================	386
39053 EPNG - 2A	7.7	1770	.96 1520	1460	0.74	295		5~	2	< 1	360	0	44	277	376
89054 EPNG - 2B	7.6	1710		1370	0.73	269	< 1.0	~ 0	2	< 1	 328	0	22	746	354
89055 EPNG - 3	7.7	2140		1800	0.93	277	< I.	> 0	2		 337	0	49	1030	440
89056 EPNG - 4	7.8	1970		1610	1.10	281	< 1.0	> 0	54		342	0	27	914	365
89056 EPNG 4 DUP	7.9	1970		1590	1.09	278	< 1.	> 0	2	~	339	0	27	903	356
89057 OCD - 1	8.0	1360		666	0.62	311	< 1.	~ 0	2	-	 379	0	27	454	264
89058 OCD - 2	7.6	1430		1090	0.55	296	4.1	1	2	~	 361	0	16	544	302
89059 S - 1	7.8	643		658	0.38	231	< I.	> 0	C-1	~	 281	0	27	270	189
89060 S - 5	7.8	927		608	0.54	252	< 1.	> 0	2	~	 308	0	22	228	153
89060 S-5 DUP	7.7	932		607	0.52	253	< 1.	> 0	2	~	 308	0	22	229	153
89061 KWBA - 1	7.7	1800		1440	0.74	282	1.3	х м	2	>	 344	0	44	778	360
89062 KWBA - 2	6.2	41 3 -	1	4.5	0.00	1.9	< I.	> 0	2		 2.3	0	0	2.5	~

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Inter-Mountain Laboratories, Inc.

College Station, TX 77840

Route 3, Box 256

Tel. (409) 776-8945

Page: 2 of 2

K.W. BROWN & ASSOCIATES, INC.

Login - 8907003

P.O. # - 25603					Project	: EPNG FL	Project: EPN6 FLORA VISTA - 63712	63712	-			7/18/89
Lab # Location Magnesium Potassium Sodium Cation An mg/l ag/l ag/l sum	Magnesium Magnesium	Potassium Potassium mg/l	Sodium sodium ag/1	Cation Sum	8	an Difference um X	Bariun ng/l	Cadnium Cadnium mg/1	chromium Chromium mg/l		Selenium Bg/l	
89052 EPN6 + 1 23	23		86		25.80						0.001	
89053 EPNG - 2A	26	8.1	רט גיע	23.30	23.26	0.09	< 0.5	0.010	0.02	\sim	0.001	
89054 EPNG - 2B	18	1.4	52	21.44	21.84	0.09	< 0.5	0.010	0.02	\sim	0.001	
89055 EPNG - 3	35	1.9	75	28.10	28.29	0.34	< 0.5	0.010	0.02	\sim	0.001	
89056 EPNG - 4	46	1.9	84	25.72	25.41	0.60	< 0.5	0.010	0.03	\sim	0.001	
39056 EPNG 4 DUP	49	1.8	83	25.48	25.12	0.71	< 0.5	0.010	0.02	\sim	0.001	
39057 OCD - 1	23	1.8	39	16.83	16.43	1.20	< 0.5	0.010	0.02	\sim	0.001	
89058 OCD - 2	14	1.8	36	17.80	17.70	0.28	< 0 . 5	0.007	0.02	\sim	0.001	
89059 S - 1	Ξ	0.9	20	11,18	11.00	0.81	< 0.5	0.007	< 0.02	\sim	0.001	
3 - 50008	22	1.4	27	10.69	10.41	1.33	< 0.5	0.070	< 0.02	\sim	0.001	
9060 S-5 DUP	21	1.6	26	10.55	10.43	0.57	< 0.5	0.010	< 0.02	\sim	0.001	
89061 KWBA - 1	33	1.8	55	23.12	23.07	0.11	< 0.5	0.010	0.02	\sim	0.001	

0.001

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0.02

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0.005

< 0.5

5.26

0.09

0.10

0

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0.6

89062 KWBA - 2

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PNAs (Water)

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Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES 06/17/89 Sample ID: EPNG 1 Date Sampled: Laboratory Number: 089052 Date Received: 06/20/89 Analysis Requested: 8100 Date Extracted: 06/21/89 Date Analyzed: 07/28/89 Sample Matrix: Water Freservative: None Condition: Cool

Parameter	Concentration	Limit	Unit≘
Naphthalene	ND	0.0018	 mg∕l
Acenaphthalene	ND	0.0023	mg∕l
Acenaphthene	ND	0.0018	mg∕l
Fluorene	ND	0.0010	mg∕l
Phenanthrene	ND	0.0010	mg∕l
Anthracene	ND	0.0010	mg∕l
Fluoranthene	ND	0.0010	mg∕l
Pyrene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg∕l
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕l
Benzo(a)pyrene	ND	0.0010	mg∕l
Dibenzo(a,h)anthracene	ND	0.0010	mg∕l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mạ∕l
Dibenz(a,h)acridine	ND	0.0010	mg∕l
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa Mayfield for Jack Morgan Reviewed by Jack Morgan, Organic Chemist



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: EPNG-2A		Date	Sampled:	06/17/89
Laboratory Number:	C89053	Date	Received:	06/20/89
Analysis Requested:	8100	Date	Extracted:	06/21/89
Sample Matrix:	Water	Date	Analyzed:	07/31/89
Preservative:	Cool			
Condition:	Cool			

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.0018	mg/1
Acenaphthalene	ND	0.0023	mg∕l
Acenaphthene	ND	0.0018	mg/l
Fluorene	ND	0.0010	mg∕l
Phenanthrene	ND	0.0010	mg∕l
Anthracene	ND	0.0010	mg∕l
Fluoranthene	ND	0.0010	mg∕l
Pyrene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg/1
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mq∕l
Benzo(a)pyrene	ND	0.0010	mg∕1
Dibenzo(a,h)anthracene	ND	0.0010	mg∕l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mg/l
Dibenz(a,h)acridine	ND	0.0010	mg∕l
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕1

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa M lack Morgan Reviewed By Jack Morgan, Organic Chemist



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: EPNG-2A		Date	Sampled:	06/17/89
Laboratory Number:	C89053DUP	Date	Received:	06/20/89
Analysis Requested:	8100	Date	Extracted:	06/21/89
Sample Matrix:	Water	Date	Analyzed:	07/31/89
Preservative:	Cool			
Condition:	Cool			

Farameter	Concentration	Limit	Units
	water taken taken andre samte samte samte samt based baset samte samte		
Naphthalene	ND	0.0018	mg∕l
Acenaphthalene	ND	0.0023	mg∕l
Acenaphthene	ND	0.0018	mg∕l
Fluorene	ND	0.0010	mg∕l
Phenanthrene	ND	0.0010	mg∕l
Anthracene	ND	0.0010	mg∕l
Fluoranthene	ND	0.0010	mg⁄l
Fyrene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg∕l
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕1
Benzo(a)pyrene	ND	0.0010	mg∕l
Dibenzo(a,h)anthracene	ND	0.0010	mg/l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕1
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mg/l
Dibenz(a,h)acridine	ND .	0.0010	mg⁄l
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed HV Jack Morgan, Organic Chemist



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: EPNG-2B		Date	Sampled:	06/17/89
Laboratory Number:	C89054	Date	Received:	06/20/89
Analysis Requested:	8100	Date	Extracted:	06/21/89
Sample Matrix:	Water	Date	Analyzed:	07/28/89
Preservative:	None			
Condition:	Cool			

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.0018	 mg/l
Acenaphthalene	ND	0.0023	mg/l
Acenaphthene	ND	0.0018	mg/l
Fluorene	ND	0.0010	mg∕l
Phenanthrene	ND	0.0010	mg∕1
Anthracene	ND	0.0010	mg∕l
Fluoranthene	ND	0.0010	mg∕1
F'∨rene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕1
Chrysene	ND	0.0010	mg∕l
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕l
Benzo(a)pyrene	ND	0.0010	mg∕1
Dibenzo(a,h)anthracene	ND	0.0010	mg/l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mo∕l
Dibenz(a,h)acridine	ND	0.0010	mg∕1
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕1
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Hoa Mayfield for Jack Morgan Reviewed by Uack Morgan, Organic Chemist



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: EPNG-3		Date	Sampled:	06/16/89
Laboratory Number:	C89055	Date	Received:	06/20/89
Analysis Requested:	8100	Date	Extracted:	06/22/89
Sample Matrix:	Soil	Date	Analyzed:	07/28/89
Preservative:	None			
Condition:	Cool			

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.0018	ma/l
Acenaphthalene	ND	0.0023	mq/l
Acenaphthene	ND	0,0018	mg∕l
Fluorene	ND	0.0010	ma∕l
Phenanthrene	ND	0.0010	ma∕l
Anthracene	ND	0.0010	ma∕1
Fluoranthene	ND	0.0010	mg∕l
Pyrene	ND	0.0010	mq∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg/l
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mą∕1
Benzo(a)pyrene	ND	0.0010	mg/l
Dibenzo(a,h)anthracene	ND	0.0010	mg∕l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg / 1
Benzo(j)fluoranthene	ND	0.0010	mg⁄1
Dibenz(a,h)acridine	ND	0.0010	mg∕l
Dibenz(a,j)acridine	ND	0.0010	mg/1
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Jor Jack Morgan Morgan, Organic Chemist Lina M Reviewed Jack b



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: EPNG-3 Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	SPIKE C89055 8100 Soil None Cool			Date Date	Sampled: Received: Extracted: Analyzed:	06/16/89 06/20/89 06/22/89 07/28/89
			Percent		Det.	
Parameter	Add	Found	Recovery		Limit	Units
Naphthalene	200	107	54%		0.0018	mg∕l
Acenaphthalene					0.0023	mg/l
Acenaphthene	200	106	53%		0.0018	mg∕l
Fluorene					0.0010	mg∕l
Phenanthrene					0.0010	mg∕l
Anthracene	200	113	57%		0.0010	mg∕l
Fluoranthene					0.0010	mg∕l
Fyrene	20	17	85%		0.0010	mg∕l
Benzo(a)Anthracene					0.0010	mg∕l
Chrysene	20	19	95%		0.0010	mg∕l
Benzo(b)fluoranthen	e10	7	70		0.0010	mg∕l
Benzo(k)fluoranthen	8				0.0010	mg/1
Benzo(a)pyrene					0.0010	mg∕l
Dibenzo(a,h)anthrac	ene				0.0010	mg/1
Indeno(1,2,3-cd)pyr	ene 20	5	25%		0.0010	mg/l
Benzo(ghi)perylene					0.0010	mg∕l
Benzo(j)fluoranthen	e				0.0010	mg∕l
Dibenz(a,h)acridine	•				0.0010	mg∕1
Dibenz(a,j)acridine	,				0.0010	mg∕l
Dibenz(a,e)pyrene					0.0010	mg∕l
Dibenz(a,h)pyrene					0.0010	mg∕l
Dibenz(a,i)pyrene					0.0010	mg∕l
3-Methylcholanthren	e				0.0010	mg/l

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa Mayfield for Aack Morgan Reviewed by Jack Morgan, Organic Chemist



06/16/89

06/20/89

07/28/89

Report Date: 08/02/89

Date Extracted: 06/22/89

Date Sampled:

Date Received:

Date Analyzed:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample JD: EPNG-4	
Laboratory Number:	C89056
Analysis Requested:	8100
Sample Matrix:	Water
Preservative:	None
Condition:	Cool

Farameter	Concentration	Limit	Units
Naphthalene	ND	0.0018	mg/l
Acenaphthalene	ND	0.0023	mg∕l
Acenaphthene	ND	0.0018	mg∕l
Fluorene	ND	0.0010	mg∕l
Phenanthrene	ND	0.0010	mg∕l
Anthracene	` ND	0.0010	mg∕l
Fluoranthene	ND	0.0010	mg∕l
Pyrene	ND	0.0010	mg∕l
Bénzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg∕l
Benzo(b)fluoranthene	ND	0.0010	mg∕1
Benzo(k)fluoranthene	ND	0.0010	mg∕l
Benzo(a)pyrene	ND	0.0010	mg∕l
Dibenzo(a,h)anthracene	ND	0.0010	mg∕l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mg/l
Dibenz(a,h)acridine	ND	0.0010	mg∕1
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕1
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

) ral (har (Llaa Reviewed by Ulack Morgan, Organic Chemist



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: EPNG-4			Date	Sampled:	06/16/89
Laboratory Number:	C89056DU	E'	Date	Received:	06/20/89
Analysis Requested:	8100		Date	Extracted:	06/23/89
Sample Matrix:	Water		Date	Analyzed:	07/31/89
Freservative:	Cool				
Condition:	Cool				
				Det.	
Parameter		Concentration		Limit	Units

	concencercion		
Naphthalene	ND	0.0018	 mg/l
Acenaphthalene	ND	0.0023	mg∕l
Acenaphthene	ND	0.0018	mg∕l
Fluorene	ND	0.0010	mg / 1
Phenanthrene	ND .	0.0010	mg∕l
Anthracene	ND	0.0010	mg∕l
Fluoranthene	ND	0.0010	mg∕l
Pyrene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mą∕1
Benzo(b)fluoranthene	0.002	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕1
Benzo(a)pyrene	ND	0.0010	mg∕1
Dibenzo(a,h)anthracene	ND	0.0010	mg∕l
Indeno(1,2,3-cd)pyrene	0.006	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mg∕l
Dibenz(a,h)acridine	ND	0.0010	mg∕l
Dibenz(a,j)acridine	ND	0.0010	mg/l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa Maufield for Jack Morgan Reviewed by Jack Morgan, Organic Chemist



06/17/89

Report Date: 08/02/89

Date Received: 06/20/89

Date Extracted: 06/21/89

Date Analyzed: 07/28/89

Date Sampled:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: OCD-1 Laboratory Number: C89057 Analysis Requested: 8100 Sample Matrix: Water Preservative: None Condition: Cool

Parameter	Concentration	Limit	Unit⊆
Naphthalene	ND	0.0018	mg/1
Acenaphthalene	ND	0.0023	mg∕l
Acenaphthene	ND	0.0018	mg∕l
Fluorene	ND	0.0010	mg∕l
Phenanthrene	ND	0.0010	mg∕l
Anthracene	ND	0.0010	mg∕l
Fluoranthene	ND	0.0010	mg∕l
Fyrene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg∕l
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕l
Benzo(a)pyrene	ND	0.0010	mg⁄l
Dibenzo(a,h)anthracene	ND	0.0010	mg∕1
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mg∕l
Dibenz(a,h)acridine	ND	0.0010	mg $/1$
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕1
3-Methylcholanthrene	ND	0.0010	mg∕l

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lioa May field for Aack Morgan Reviewed by Jack Norgan, Organic Chemist



Report Date: 08/02/89

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: OCD-2Date Sampled:06/17/89Laboratory Number:C89058Date Received:06/20/89Analysis Requested:8100Date Extracted:06/21/89Sample Matrix:WaterDate Analyzed:07/14/89Preservative:NoneCoolDate Analyzed:07/14/89

Concentration	Limit	Units
ND	0.0018	 mg/l
ND	0.0023	mg∕1
ND	0.0018	mg∕l
ND	0.0010	mg∕l
ND	0.0010	mg∕l
ND	0.0010	mg/1
ND	0.0010	mg∕l
ND	0,0010	mg∕l
ND	0.0010	mg∕l
ND	0.0010	mç/l
ND	0.0010	mg∕l
	ND ND ND ND ND ND ND ND ND ND ND ND ND N	ND 0.0018 ND 0.0023 ND 0.0018 ND 0.0010 ND

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Jack Morgan, Organic Chemist



06/16/89

Report Date: 08/02/89

Date Received: 06/20/89

Date Extracted: 06/21/89 Date Analyzed: 07/28/89

Date Sampled:

Det.

Client: K.W.BROWN AND ASSOCIATES

Sample ID: S-1 Laboratory Number: C89059 Analysis Requested: 8100 Sample Matrix: Water Preservative: None Condition: Cool

Parameter	Concentration	Limit	Units
	ND	0.0018	 mg/l
Naphthalene			
Acenaphthalene	ND	0.0023	mg/1
Acenaphthene	ND	0.0018	mg∕l
Fluorene	ND	0.0010	mg∕l
Phenanthrene	ND	0.0010	mg∕l
Anthracene	ND)	0.0010	mg∕1
Fluoranthene	ND	0.0010	mg∕l
Pyrene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg∕1
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕l
Benzo(a)pyrene	ND	0.0010	mg∕l
Dibenzo(a,h)anthracene	ND	0.0010	mg∕l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mg∕l
Dibenz(a,h)acridine	ND	0.0010	mg∕l
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method: Method: NSFI

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Jorgan, Organic Chemist Reviewed b Jack



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: S-1 Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	SPIKE C89059 8100 Water None Cool			Date Date	Sampled: Received: Extracted: Analyzed:	06/16/89 06/20/89 06/22/89 07/28/89
			Percent		Det.	
Parameter	Add	Found	Recovery		Limit	Units
Naphthalene					0.0018	mg/1
Acenaphthalene	179	135	75%		0.0023	ma∕1
Acenaphthene					0.0018	mg∕1
Fluorene					0.0010	mg∕l
Phenanthrene	179	132	74%		0.0010	mą∕1
Anthracene					0.0010	mg∕l
Fluoranthene	18	13	72%		0.0010	mg∕l
Fyrene					0.0010	mg∕l
Benzo(a)Anthracene	18	10	56%		0.0010	mg∕l
Chrysene					0.0010	mg∕l
Benzo(b)fluoranthen		13	72%		0.0010	mg∕l
Benzo(k)fluoranthen					0.0010	mg/l
Benzo(a)pyrene		21	117%		0.0010	mg/l
Dibenzo(a,h)anthrac		5	28%		0.0010	mg/l
Indeno(1,2,3-cd)pyr	ene				0.0010	mg/1
Benzo(ghi)perylene					0.0010	mg/1
Benzo(j)fluoranthen			~~ *		0.0010	mg/l
Dibenz(a, h)acridine		16	89%		0.0010	mg/1
Dibenz(a,j)acridine	1				0.0010	mg/1
Dibenz(a,e)pyrene Dibenz(a,h)pyrene					0.0010 0.0010	mg∕l mp/l
Dibenz(a,n)pyrene Dibenz(a,i)pyrene					0.0010	mg∕l mg∕l
3-Methylcholanthren	0				0.0010	mg/l mg/l
o nechyrchoranthren					OF COTO	md \ T

Methód:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Wack Morgan, Organic Chemist



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: S-5 Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89060 8100 Water None Cool		Date F Date E	Sampled: Received: Extracted: Analyzed:	06/16/89 06/20/89 06/22/89 07/14/89
Et a ser a ser a la sera				Det.	
Parameter		Concentration		Limit	Units
Naphthalene		ND		0.0018	mq/l
Acenaphthalene		ND		0.0023	mg/l
Acenaphthene		ND		0.0018	mg∕l
Fluorene		ND		0.0010	mq/l
Phenanthrene		ND		0.0010	mg∕l
Anthracene		ND		0.0010	mg/l
Fluoranthene		ND		0.0010	mg∕l
Fyrene		ND		0.0010	mg/l
Benzo(a)Anthracene		ND		0.0010	mg∕l
Chrysene		ND		0.0010	mg/l
Benzo(b)fluoranthen	e	ND		0.0010	mg/l
Benzo(k)fluoranthen	e	ND		0.0010	mg∕l
Benzo(a)pyrene		ND		0.0010	mg∕1
Dibenzo(a,h)anthrac		ND		0.0010	mg∕l
Indeno(1,2,3-cd)pyr	ene	ND		0.0010	mg/l
Benzo(ghi)perylene		ND		0.0010	mg/1
Benzo(j)fluoranthen		ND		0.0010	mg/1
Dibenz(a,h)acridine		ND		0.0010	mg∕1
Dibenz(a,j)acridine		ND		0.0010	mg∕l
Dibenz(a,e)pyrene		ND		0.0010	mg∕1
Dibenz(a,h)pyrene		ND		0.0010	mg∕l
Dibenz(a,i)pyrene		ND		0.0010	mg/l
3-Methylcholanthren	e	ND		0.0010	mg∕l

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa Marfield for Jack Morgan Reviewed by Jack Morgan, Organic Chemist



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: S-5 Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89060	Date Date	Sampled: Received: Extracted: Analyzed:	06/20/89 06/23/89
Condition:	Concontration		Det.	l les à la cr

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.0018	 mg/l
Acenaphthalene	ND	0.0023	ma∕1
Acenaphthene	ND	0.0018	mg∕l
Fluorene	ND	0.0010	mg∕l
Fhenanthrene	ND	0.0010	mg∕l
Anthracene	ND	0.0010	mg∕l
Fluoranthene	ND)	0.0010	mg∕l
Fyrene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg∕l
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕l
Benzo(a)pyrene	ND	0.0010	mg∕l
Dibenzo(a,h)anthracene	ND	0.0010	mg∕l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND	0.0010	mg∕l
Dibenz(a,h)acridine	ND	0.0010	mg∕l
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Loc Mayfield for Aack Morgan Reviewed by Jack Morgan, Organic Chemist



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: KWBA-1		Date	Sampled:	06/16/89
Laboratory Number:	C89061	Date	Received:	06/20/89
Analysis Requested:	8100	Date	Extracted:	06/21/89
Sample Matrix:	Water	Date	Analyzed:	07/17/89
Preservative:	None			
Condition:	Cool			
			Det.	

Parameter	Concentration	Limit	Units
Naphthalene	ND	0.0018	mg∕l
Acenaphthalene	ND	0.0023	mg∕l
Acenaphthene	ND	0.0018	mg∕l
Fluorene	ND	0.0010	mg/l
Phenanthrene	ND	0.0010	mg∕l
Anthracene	ND	0.0010	mg∕l
Fluoranthene	ND	0.0010	mg∕l
F'yrene	ND	0.0010	mg∕l
Benzo(a)Anthracene	ND	0.0010	mg∕l
Chrysene	ND	0.0010	mg∕l
Benzo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕l
Benzo(a)pyrene	ND	0.0010	mg∕l
Dibenzo(a,h)anthracene	ND	0.0010	mg∕l
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg∕l
Benzo(j)fluoranthene	ND .	0.0010	mg∕l
Dibenz(a,h)acridine	ND	0.0010	mg∕l
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕1
3-Methylcholanthrene	ND	0.0010	mg∕l

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Lipa Mayfield for Jack Morgan Reviewed by Jack Morgan, Organic Chemist

inl
Inter-Mountain
Laboratories, Inc.

Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: KWBA-2 Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89062 8100 Water None Cool		Date Date	Sampled: Received: Extracted: Analyzed:	06/17/89 06/20/89 06/21/89 06/23/89
Parameter		Convertueties		Det.	فاست شعاسي
Far amecer 		Concentration		Límit	Units
Naphthalene		ND		0.0018	mg∕l
Acenaphthalene		ND		0.0023	mg∕l
Acenaphthene		ND		0.0018	mg∕l
Fluorene		ND		0.0010	mg∕l
Phenanthrene		ND		0.0010	mg∕l
Anthracene		ND		0.0010	mg∕l
Fluoranthene		ND		0.0010	mg∕l
Fyrene		ND		0.0010	mg∕l
Benzo(a)Anthracene		ND		0.0010	mg∕l
Chrysene		ND		0.0010	mg∕l
Benzo(b)fluoranthen		ND		0.0010	mg∕l
Benzo(k)fluoranthen	e	ND		Ò.0010	mg∕l
Benzo(a)pyrene		ND		0.0010	mg∕l
Dibenzo(a,h)anthrac		ND		0.0010	mg∕l
Indeno(1,2,3-cd)pyr	ene	ND		0.0010	mg∕l
Benzo(ghi)perylene		ND		0.0010	mg∕l
Benzo(j)fluoranthen		ND		0.0010	mg∕l
Dibenz(a,h)acridine		ND		0.0010	mg∕l
Dibenz(a,j)acridine		ND		0.0010	mg∕l
Dibenz(a,e)pyrene		ND		0.0010	mg∕l
Dibenz(a,h)pyrene		ND		0.0010	mg∕l
Dibenz(a,i)pyrene		ND		0.0010	mg∕l
3-Methylcholanthren	e	ND		0.0010	mg/l

Method: Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by Wack Borgan, Organic Chemist



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: BLANK Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	BLANK 8100 Water None Cool		Date Date	Sampled: Received: Extracted: Analyzed:	06/22/89 06/22/89 06/22/89 06/23/89
Year Man 9 3 Year and Year and Year 1 6 4	and and provide			Det.	
Parameter		Concentration		Limit	Units
		And approximate white water party and and and and approximate and and			
Naphthalene		ND		0.0018	mg∕l
Acenaphthalene		ND		0.0023	mg∕l
Acenaphthene		ND		0.0018	mg/l
Fluorene		ND		0.0010	mg/1
Dhennethrong		NID		0.0010	m ~ / 1

Phenanthrene	ND	0.0010	mg∕l
Anthracene	ND	0.0010	mg∕1
Fluoranthene	ND	0.0010	mg∕1
Pyrene	ND	0.0010	mg/l
Benzo(a)Anthracene	ND	0.0010	mg/l
Chrysene	ND	0.0010	mg∕l
Bengo(b)fluoranthene	ND	0.0010	mg∕l
Benzo(k)fluoranthene	ND	0.0010	mg∕1
Benzo(a)pyrene	ND	0.0010	mg∕l
Dibenzo(a,h)anthracene	ND	0.0010	mg∕1
Indeno(1,2,3-cd)pyrene	ND	0.0010	mg∕l
Benzo(ghi)perylene	ND	0.0010	mg/l
Benzo(j)fluoranthene	ND	0.0010	mg∕l
Dibenz(a,h)acridine	ND	0.0010	mg/l
Dibenz(a,j)acridine	ND	0.0010	mg∕l
Dibenz(a,e)pyrene	ND	0.0010	mg∕l
Dibenz(a,h)pyrene	ND	0.0010	mg∕l
Dibenz(a,i)pyrene	ND	0.0010	mg∕l
3-Methylcholanthrene	ND	0.0010	mg∕l

Method:

Method 8100, Polynuclear Aromatic Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa Mayfield for Jack Morgan Reviewed by Dack Morgan, Organic Chemist

GLYCOLS (Water)

(macer)

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> mg∕kg mg∕kg

Report Date: 07/19/89

Client: KW Brown and Associates

Parameter		Concentration	Det. Limit	<u>t</u>	Units
Condition:	Cool				
Freservative:	None				
Sample Matrix:	Water		Date	Analyzed:	06/30/89
Analysis Requested:	Glycols		Date	Extracted:	06/21/89
3	C89052		Date	Received:	06/20/89
Sample ID:	EPNG-1		Date	Sampled:	06/17/89

	Allow print rabbs option about this many proof proof which which they	angle blow weath party sizes	-
Ethylene Glycol	ND	5.0	(
Diethylene Glycol	ND	5.0	ſ

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89 Client: KW Brown and Associates Sample ID: EPNG-2A Date Sampled: 06/17/89 Laboratory Number: C89053 Date Received: 06/20/89 Analysis Requested: Glycols Date Extracted: 06/21/89 Sample Matrix: Water Date Analyzed: 06/30/89 Freservative: None Condition: Cool Det. Farameter Concentration Limit Units --------------Ethylene Glycol ND 5.0 mg∕kg Diethylene Glycol ND 5.0 mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown and Associates

Davaastav		Concenturtion	Det.	_	ایر بن بن بن بن
Condition:	Cool				
Preservative:	None				
Sample Matrix:	Water		Date	Analyzed:	06/30/89
Analysis Requested:	Glycols		Date	Extracted:	06/21/89
Laboratory Number:	C89054		Date	Received:	06/20/89
Sample ID:	EPNG-2B		Date	Sampled:	06/17/89

Farameter	Concentration	Limit	Units
		adate parte parte adder adder anner	
Ethylene Glycol	ND	5.0	mg∕kg
Diethylene Glycol	ND	5.0	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

_____.

Client: KW Brown and Associates Sample ID: EFNG-3 Date Sampled: 06/17/89 Laboratory Number: C89055 Date Received: 06/20/89 Analysis Requested: Glycols Date Extracted: 06/21/89 Sample Matrix: Water Date Analyzed: 06/30/89 Preservative: None Condition: Cool Det. Parameter Concentration Limit Units ---------------------Ethylene Glycol ND 5.0 mg/kg Diethylene Glycol ND. 5.0 mq/kq

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Analysis Ŕequested: Sample Matrix:	EPNG-4 C89056 Glycols Water	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/16/89 06/20/89 06/21/89 06/30/ 89
Preservative: Condition:	None Cool		
		Det.	
Parameter	Concentration	Limit	Units
were and a second second device second second second second	then your real work and the ann again their data to a set		
Ethylene Glycol	ND	5.0	mg∕kg
Diethylene Glycol	ND	5.0	mą∕ką

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by


mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID:	OCD-2	Date Sampled:	06/16/89
Laboratory Number:	C89058	Date Received:	06/20/89
Analysis Requested:	Glycols	Date Extracted:	06/21/89
Sample Matrix:	Water	Date Analyzed:	06/30/89
Preservative:	None		
Condition:	Cool		
		Det.	
Parameter	Concentration	Limit	Units
Ethylene Glycol	ND	5.0	mg∕kg
Diethylene Glycol	ND	5.0	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



		Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	S1 C89059 Glycols Water None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/16/89 06/20/89 06/21/89 06/30/89
Parameter	Concentration	Det. Limít	Units
Ethylene Glycol Diethylene Glycol	ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	S5 C89060 Glycols Water None Cool		Date Sampled: Date Received: Date Extracted Date Analyzed:	06/20/89 : 06/21/89
Parameter		Concentration	Det. Limit	Unite
Ethylene Glycol Diethylene Glycol		ND ND	5.0 5.0	ng∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	KWBA-1 C89061 Glycols Water None Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/20/89
			Det.	
Parameter		Concentration	Limit	Units
plane there were never and very rear and a grant			while every score value filter	
Ethylene Glycol		ND	5.0	mg∕kg
Diethylene Glycol		ND	5.O	mg/kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



Report Date: 07/19/89

Client: KW Brown	and Associates		
Sample ID:	KWBA-2	Date Sampled:	06/16/89
Laboratory Number:	C89062	Date Received:	06/20/89
Analysis Requested:	Glycols	Date Extracted:	06/21/89
Sample Matrix:	Water	Date Analyzed:	06/30/89
Preservative:	None		
Condition:	Cool		
		Det.	
Parameter	Concentration	Limit	Units
Ethylene Glycol	ND	5.0	mg/kg
Diethylene Glycol	ND	5.0	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by



** QUALITY ASSURANCE MATRIX DUPLICATE	E REPORT	Report Date:	07/19/89
Client: KW Brown	and Associates		
Sample ID:	EPNG-4	Date Sampled:	06/16/89
Laboratory Number:	C89056	Date Received:	06/20/89
Analysis Requested:	Glycols	Date Extracted:	06/21/89
Sample Matrix:	Water	Date Analyzed:	06/30/89
Freservative:	None		
Condition:	Cool		
		Det.	
Parameter	Concentration	Limit	Units
	auffe these lates before these space and based based based autor anget	terms and table them area	
Ethylene Glycol	ND	5.0	mg∕kg
Diethylene Glycol	ND	5.0	mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Inter-Mountain Laboratories, Inc.			Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945	
** QUALITY ASSURANCE MATRIX DUPLICATE	E REPORT		Report Date:	07/19/89
Client: KW Brown	and Asso	ciates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	S5 C89060 Glycols Water None Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/20/89
Parameter		Concentration	Det. Limit	Units
Ethylene Glycol Diethylene Glycol		ND ND	5.0 5.0	mg∕kg mg∕kg

ND - Parameter not detected at the stated detection limit.

Comments:

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Reviewed by

CHLORINATED HYDROCARBONS (Water)

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Method: Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

A CONTRACTOR OF THE CONTRACT OF THE CONTRACT OF THE

Lusa Mayfield Reviewed by

inter-Mountain Laboratories, Inc.		Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945	
		Report Date:	08/02/89
Client: K.W.BROWN AND AS	SOCIATES		
Sample ID: EPNG-2A Laboratory Number: C89053 Analysis Requested: 8120 Sample Matrix: Water		Date Sampled: Date Received: Date Extracted: Date Analyzed:	
Preservative: None Condition: Cool			
Parameter	Concentration	Det. Limit	Units
1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Hexachlorobutadiene 1,2,4-Trichlorobenzene Hexachlorocyclopentadiene 2-Chloronapthalene	ND ND ND ND ND ND	0.003 0.003 0.001 0.0007 0.0001 0.0007 0.0007 0.0009	mg/l mg/l mg/l mg/l mg/l mg/l mg/l
Hexachlorobenzene	ND	0.0001	mg/l

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

rela Mau

Reviewed by Usa Mayfield

Inter-Mountain Laboratories, Inc.		Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945	
		Report Date:	08/02/89
Client: K.W.BROWN	AND ASSOCIATES		
Sample ID: EPNG-2B Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89054 8120 Water None Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	
Farameter	Concentration	Det. Limit	Units
1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Hexachlorobutadiene 1,2,4-Trichlorobenze Hexachlorocyclopenta 2-Chloronapthalene Hexachlorobenzene	adiene ND ND	0.003 0.003 0.001 0.0007 0.0007 0.0007 0.0007 0.0009	mg/l mg/l mg/l mg/l mg/l mg/l mg/l mg/l

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Maul

Inter-Mountain Laboratories, Inc.		College Station,	e 3, Box 256 Texas 77840)9) 776-8945
		Report Date:	08/02/89
Client: K.W.BROWN	AND ASSOCIATES		
Sample ID: EPNG-3 Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89055 8120 Water None Cool	Date Sampled: Date Received: Date Extracted Date Analyzed:	06/16/89 06/20/89 06/22/89 07/27/89
Parameter	Concentration	Det. Limit	Units
1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Hexachlorobutadiene 1,2,4-Trichlorobenze Hexachlorocyclopenta 2-Chloronapthalene		 0.005 0.005 0.002 0.001 0.0001 0.0001 0.001 0.002	mg/l mg/l mg/l mg/l mg/l mg/l mg/l

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

isa Martield

Reviewed by Losa Mayfield

and the second
inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945	
Laboratories, Inc.		Report Date: 08/02/89
Client: K.W.BROWN AN	D ASSOCIATES	
Sample ID: EPNG-3 DUP	LICATE	Date Sampled: 06/16/89
Laboratory Number: C89	055	Date Received: 06/20/89
Analysis Requested: 812	0	Date Extracted: 06/22/89
Sample Matrix: Wat	er	Date Analyzed: 07/27/89
Preservative: Non	e	
Condition: Coo	1	
		Det.
Parameter	Concentration	Limit Units
1,3-Dichlorobenzene	ND	0.005 mg/l
1,4-Dichlorobenzene	ND	0.005 mg/l
1,2-Dichlorobenzene	ND	0.002 mg/l
Hexachlorobutadiene	ND	0.001 mg/l
1,2,4-Trichlorobenzene	ND	0.0001 mg/1
Hexachlorocyclopentadie	ne ND	0.001 mg/l
2-Chloronapthalene	ND	0.002 mg/l
Hexachlorobenzene	ND	0.0001 mg/l

Method: Metho

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

至于13、444034

Reviewed by Wisa Mayfield



06/16/89

06/20/89

07/27/89

Report Date: 08/02/89

Date Extracted: 06/22/89

Date Sampled:

Date Received:

Date Analyzed:

Client: K.W.BROWN AND ASSOCIATES

Sample ID: EPNG-4 Laboratory Number: C89056 Analysis Requested: 8120 Sample Matrix: Water Preservative: None Condition: Cool

Parameter	Concentration	Det. Limit	Units
		L III L \	
1,3-Dichlorabenzene	ND	0.005	mg∕l
1,4-Dichlorobenzene	ND	0.005	mg∕l
1,2-Dichlorobenzene	ND	0.002	mg∕l
Hexachlorobutadiene	ND	0.001	mg/l
1,2,4-Trichlorobenzene	ND	0.0001	mg/l
Hexachlorocyclopentadiene	ND	0.001	mg/l
2-Chloronapthalene	ND	0.002	mg∕l
Hexachlorobenzene	$\sum_{i=1}^{n} \left(\frac{ND}{D} \right)^{1/2} \left(\frac{1}{2} + \frac{1}{2} $	0.0001	. mg/1

Method: Method 81

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Lits Mayfield

ł	Inter-Mountain			College Statio	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
	Laboratories, Inc.			Report Date:	08/02/89		
	Client: K.W.BROU	N AND AS	SOCIATES				
	Sample ID: EPNG-4 Laboratory Number: Analysis Requested Sample Matrix: Preservative: Condition:	DUPLICA C89056 8120 Water None Cool	TE	Date Sampled: Date Received Date Extracte Date Analyzed	: 06/20/89 d: 06/22/89		
	Parameter		Concentration	Det. Limit	Units		
	1,3-Dichlorobenzen 1,4-Dichlorobenzen 1,2-Dichlorobenzen Hexachlorobutadien 1,2,4-Trichloroben Hexachlorocyclopen 2-Chloronapthalene Hexachlorobenzene	e e cene	ND ND ND ND ND ND ND ND	0.005 0.005 0.002 0.001 0.0001 0.001 0.002 0.0001	mg∕l mg/l		

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Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

an a la companya na sana na sa

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by Lisa Mayfield



Report Date: 08/02/89

Client: K.W.BROWN AND ASSOCIATES

Sample ID: OCD-1			Date	Sampled:	06/17/89	
Laboratory Number:	C89057		Date	Received:	06/20/89	
Analysis Requested:	8120		Date	Extracted:	06/21/89	
Sample Matrix:	Water		Date	Analyzed:	07/27/89	
Preservative:	None					
Condition:	Cool					
				Det.		
Parameter		Concentration		Limit	Units	
1,3-Dichlorobenzene		ND		0.003	mg/l	
1,4-Dichlorobenzene		ND		0.003	mg/l	
1,2-Dichlorobenzene		ND		0.001	mg/l	
Hexachlorobutadiene		ND		0.0007	mg/l	
1,2,4-Trichlorobenze	ene	ND		0.0001	mg/l	
Hexachlorocyclopenta	adiene	ND		0.0007	mg∕l	
2-Chloronapthalene	· ·	ND		0.0009	mg∕l	
Hexachlorobenzene	•	ND		0.0001	mg/l	

Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Lisa Mayfield Reviewed by



Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by ****isa Mayfield

Inter-Mountain		Route 3, Box 2 College Station, Texas 778 Tel. (409) 776-89		
Laboratories, Inc.		Report Date:	08/02/89	
Client: K.W.BROWN AND AS	SOCIATES			
Sample ID: S-1		Date Sampled:	06/16/8	
Laboratory Number: C89059		Date Received:	06/20/8	
Analysis Requested: 8120		Date Extracted:	06/22/8	
Sample Matrix: Water		Date Analyzed:	07/27/8	
Preservative: None				
Condition: Cool				
		Det.		
Parameter	Concentration	Limit	Units	
1,3-Dichlorobenzene	ND	0.005	 mg∕l	
1,4-Dichlorobenzene	ND	0.005	mg∕l	
1,2-Dichlorobenzene	ND	0.002	mg/l	
Hexachlorobutadiene	ND	0.001	mg∕l	
1,2,4-Trichlorobenzene	ND	0.0001	mg∕l	
Hexachlorocyclopentadiene	ND	0.001	mg∕l	
2-Chloronapthalene	ND	0.002	mg∕l	
Hexachlorobenzene	ND	0.0001	mg∕l	

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by Wisa Mayfield

Inter-Mountain Laboratories, Inc.	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
caboracones, inc.		Report Date:	08/02/85
Client: K.W.BROWN AND	ASSOCIATES		
Sample ID: S-5		Date Sampled:	06/16/89
Laboratory Number: C3900	50	Date Received:	06/20/89
Analysis Requested: 8120		Date Extracted:	06/22/89
Sample Matrix: Water	-	Date Analyzed:	07/27/89
Preservative: None			
Condition: Cool			
		Det.	
Parameter	Concentration	Limit	Units
1,3-Dichlorobenzene	ND	0.005	mg∕l
1,4-Dichlorobenzene	ND	0.005	mg∕l
1,2-Dichlorobenzene	ND	0.002	mg/l
Hexachlorobutadiene	ND	0.001	mg∕l
1,2,4-Trichlorobenzene	ND	0.0001	mg∕l
Hexachlorocyclopentadiene		0.001	mg∕l
2-Chloronapthalene	ND	0.002	mg∕l
Hexachlorobenzene	ND	0.0001	mg/l

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Reviewed by Usa Mayfield

inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945		
Laboratories, Inc.		Report Date:	08/02/89
Client: K.W.BROW	N AND ASSOCIATES		
Sample ID: S-5	DUPLICATE	Date Sampled:	06/16/85
Laboratory Number:	C89060	Date Received:	06/20/89
Analysis Requested:	8120	Date Extracted:	06/22/85
Sample Matrix:	Water	Date Analyzed:	07/27/89
Preservative:	None		
Condition:	Cool		
		Det.	
Parameter	Concentration	Limit	Units
1,3-Dichlorobenzene	ND	0.005	 mg∕1
1,4-Dichlorobenzene	ND	0.005	mg∕l

1,4-Dichlorobenzene ND 0.005 1,2-Dichlorobenzene ND 0.002 mg∕l 0.001 Hexachlorobutadiene ND mg/l 0.0001 1,2,4-Trichlorobenzene ND mg∕l Hexachlorocyclopentadiene ND 0.001 mg/l 2-Chloronapthalene ND 0.002 mg∕l 0.0001 Hexachlorobenzene ND mg∕l

Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

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ND - Parameter not detected at the stated detection limit.

Reviewed by **L**isa Mayfield

Inter-Mountain	Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945				
Laboratories, Inc.			Repor	t Date:	08/02/89
Client: K.W.BROWM	N AND ASS	OCIATES			
Sample ID: KWBA-1				Sampled:	06/17/89
Laboratory Number:	C89061			Received:	06/20/89
Analysis Requested:	8120			Extracted:	
Sample Matrix:	Water		Date	Analyzed:	07/27/89
Preservative: Condition:	None Cool				
CONDICION:	COOI			Det.	
Parameter		Concentration		Limit	Units
1,3-Dichlorobenzene		ND		0.003	 mg∕l
1,4-Dichlorobenzene		ND		0.003	mg/l
1,2-Dichlorobenzene		ND		0.001	mg∕l
Hexachlorobutadiene		ND		0.0007	mg/1
1,2,4-Trichlorobenz	ene	ND		0.0001	mg∕l
Hexachlorocyclopenta	adiene	ND		0.0007	mg∕l
2-Chloronapthalene		ND		0,0009	mg/l
Hexachlorobenzene				0.0001	mg/l

Method: Method 8

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

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by Jisa Mayfield Reviewed



Route 3, Box 256 College Station, Texas 77840 Tel. (409) 776-8945

Sample ID: KWBA-2 Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	C89062 8120 Water None Cool		Date Date	Sampled: Received: Extracted: Analyzed:	06/17/ 06/20/ 06/22/ 07/25/	89 89
	COOL			Det.		
Parameter		Concentration		Limit	Units	
				and their sums are black		
1,3-Dichlorobenzene		ND		0.003	mg∕l	
1,4-Dichlorobenzene		ND		0.003	mg∕l	
1,2-Dichlorobenzene		ND		0.001	mg∕l	
Hexachlorobutadiene		ND		0.0007	mg∕l	. •
1,2,4-Trichlorobenz	ene	ND		0.0001	mg∕l	
Hexachlorocyclopent		ND		0.0007	mg/1	
2-Chloronapthalene		ND		0.0009	mq/l	
Hexachlorobenzene		ND		0.0001	mg∕l	

Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

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ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by Uisa Mayfield



06/16/89

06/20/89

07/27/89

Report Date: 08/02/89

Date Extracted: 06/22/89

Date Sampled:

Date Received:

Date Analyzed:

Client: K.W.BROWN AND ASSOCIATES

Sample ID: BLANK Laboratory Number: BLANK Analysis Requested: 8120 Sample Matrix: Water Preservative: None Condition: Cool

		Det.	
Parameter	Concentration	Limit	Units
-part site init dar unt unt tite all all the			
1,3-Dichlorobenzene	ND	0.005	mg∕l
1,4-Dichlorobenzene	ND	0.005	mg∕l
1,2-Dichlorobenzene	ND	0.002	mg∕l
Hexachlorobutadiene	ND	0.001	mg/l
1,2,4-Trichlorobenzene	ND	0.0001	mg∕l
Hexachlorocyclopentadiene	ND .	0.001	mg∕l
2-Chloronapthalene	ND	0.002	mg∕l
Hexachlorobenzene	ND	0.0001	mg∕l

Method:

Method 8120, Chlorinated Hydrocarbons, SW-846, USEPA, (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by Liba Mayfield

VOLATILES (Water)

** QUALITY ASSURANCE REPORT FIELD DUPLICATE

Client: Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	5-5 C89060	and Associates Halocarbons	Report Date: Date Sampled: Date Received: Date Extracted: Date Analyzed:	07/07/89 06/16/89 06/20/89 NA 06/30/89
Parameter		Concentration	Det. Limit	Units
Chloromethane Bromomethane Dichlorodifluoromet Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene Trichlorofluorometh 1,1-Dichloroethane trans-1,2-Dichloroe Chloroform 1,2-Dichloroethane 1,1,1-Trichloroethan Carbon Tetrachlorid Bromodichloromethan 1,2-Dichloropropane cis-1,3-Dichloropro trans-1,3-Dichlorop Trichloroethene (TC Dibromochloromethan 1,1,2-Trichloroethan 2-Chloroethylvinyl Bromoform 1,1,2,2-Tetrachloro Tetrachloroethene (Chlorobenzene	ane thene ne e pene ropene E) e ne ether ethane	ND ND ND ND ND ND ND ND ND ND ND ND ND N	$ \begin{array}{c} 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\$	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l
1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene		ND ND ND ND	1.0 1.0 1.0	ug/1 ug/1 ug/1 ug/1

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

** QUALITY ASSURANCE REPORT FIELD DUPLICATE

Report Date: 07/07/89 Client: KW Brown and Associates Sample ID: S - 5Date Sampled: 06/16/89 C89060 Date Received: 06/20/89 Laboratory Number: Date Extracted: NA Analysis Requested: 8020 Date Analyzed: 06/30/89 Sample Matrix: Water Preservative: Cool Det. Parameter Concentration Limit Units _____ 0.20 0.24 ug/l Benzene 0.20 Toluene 0.32 ug/l Ethylbenzene ND 0.20 ug/l 0.20 ND ug/l Chlorobenzene ND 0.20 p,m-Xylene ug/l o-Xylene ND 0.20 ug/l 0.40 1,4 Dichlorobenzene ND ug/l 1,3 Dichlorobenzene ND 0.30 ug/l 1,2 Dichlorobenzene ND 0.40 ug/l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Client:	KW Brown	and	Associates	Report	Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Freservative: Condition:	EPNG-1 C89052 Volatile Water None Cool	Halo	ocarbons	Date R Date E	ampled: eceived: xtracted: nalyzed:	06/17/89 06/20/89 NA 07/01/89
Parameter		Con	centration		Det. Limit	Units
Chloromethane			ND		1.0	ug/l
Bromomethane			ND		1.0	ug/l
Dichlorodifluoromet	hane		ND		1.0	ug/l
Vinyl Chloride			ND		1.0	ug∕l
Chloroethane			ND		1.0	ug/l
Methylene Chloride			2.1		1.0	ug/l
1,1-Dichloroethene			ND		1.0	ug/l
Trichlorofluorometh	ane		ND		1.0	ug/1
1,1-Dichloroethane			ND		1.0	ug/l
trans-1,2-Dichloroe	thene		ND		1.0	ug/]
Chloroform			ND		1.0	ug/1
1,2-Dichloroethane			ND		1.0	ug/l
1,1,1-Trichloroetha			ND		1.0	ug/l
Carbon Tetrachlorid			ND		1.0	ug/l
Bromodichloromethan			ND		1.0	ug/l
1,2-Dichloropropane			ND		1.0	ug/l
cis-1,3-Dichloropro			ND		1.0	ug/l
trans-1,3-Dichlorop			ND		1.0	ug/l
Trichloroethene (TC			ND		1.0	ug/l
Dibromochloromethan			ND		1.0	ug/l
1,1,2-Trichloroetha			ND		1.0	ug/l
2-Chloroethylvinyl	ether		ND		1.0	ug/l
Bromoform			ND		1.0	ug/l
1,1,2,2-Tetrachloro			ND		1.0	ug/l
Tetrachloroethene (PCE)		ND		1.0	ug/l
Chlorobenzene			ND		1.0	ug/l
1,3-Dichlorobenzene			ND		1.0	ug/l
1,2-Dichlorobenzene			ND		1.0	ug/l
1,4-Dichlorobenzene			ND		1.0	ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by Jack M. Morgan

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Organic Analyst

Report Date: 07/07/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Freservative:	EPNG-1 C89052 8020 Water Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed: Det.	
Parameter		Concentration	Limit	Units
Benzene		ND	0.20	ug/l
Toluene		ND	0.20	ug/l
Ethylbenzene		ND	0.20	ug/l
Chlorobenzene		ND	0.20	ug/l
p,m-Xylene		0.34	0.20	ug/l
o-Xylene		ND	0.20	ug/l
1,4 Dichlorobenzene		ND	0.40	ug∕l
1,3 Dichlorobenzene		ND	0.30	ug/l
1,2 Dichlorobenzene		ND	0.40	ug/l

Method 8020, Aromatic Volatile Organics, SW-846, USEPA Method: (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

1/u ck M) Morgan ganic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	EPNG-2A C89053 Volatile Water None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/17/89 06/20/89 NA 07/01/89
Parameter		Concentration	Det. Limit	Units
Chloromethane		ND	1.0	ug/1
Bromomethane		ND	1.0	ug/l
Dichlorodifluoromet	hane	ND	1.0	ug/l
Vinyl Chloride		ND	1.0	ug/l
Chloroethane		ND	1.0	ug∕l
Methylene Chloride		ND	1.0	ug∕l
1,1-Dichloroethene		ND	1.0	ug∕l
Trichlorofluorometh	ane	ND	1.0	ug∕l
1,1-Dichloroethane		ND	1.0	ug∕l
trans-1,2-Dichloroe	thene	ND	1.0	ug∕l
Chloroform		ND	1.0	ug∕l
1,2-Dichloroethane		ND	1.0	ug∕l
1,1,1-Trichloroetha		ND	1.0	ug∕l
Carbon Tetrachlorid		ND	1.0	ug∕l
Bromodichloromethan		ND	1.0	ug∕l
1,2-Dichloropropane		ND	1.0	ug∕l
cis-1,3-Dichloropro		ND	1.0	ug/l
trans-1,3-Dichlorop		ND	1.0	uņ∕l
Trichloroethene (TC		ND	1.0	ug/l
Dibromochloromethan		ND	0 . t	ug∕l
1,1,2-Trichloroetha		ND	1.0	ug/l
2-Chloroethylvinyl	ether	ND	1.0	ug∕l
Bromoform		ND	1.0	ug/l
1,1,2,2-Tetrachloro		ND	1 .O	ug∕l
Tetrachloroethene (PCE)	ND	1.0	ug∕l
Chlorobenzene		ND	1.0	ug∕l
1,3-Dichlorobenzene		ND	1.0	ug∕l
1,2-Dichlorobenzene		ND	1.0	ug/l
1,4-Dichlorobenzene		ND	1.0	ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Jack M. Morgan Organic Analyst

Report Date: 07/07/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	EPNG-2A C89053 8020 Water Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/17/89 06/20/89 NA 07/01/89
			Det.	
Parameter		Concentration	Limit	Units
Miner Brain ange- 4750 atten parts mane bank parts				
Benzene		8.1	0.20	ug∕l
Toluene		ND	0.20	ug/l
Ethylbenzene		37.4	0.20	ug/l
Chlorobenzene		ND	0.20	ug/l
p,m-Xylene		162	0.20	ug/l
o-Xylene		30.4	0.20	uq/l
1,4 Dichlorobenzene		ND	0.40	ug/l
1,3 Dichlorobenzene		ND	0.30	uq/l
1,2 Dichlorobenzene		ND	0.40	ug∕l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

MILL Jack M. Morgan Organic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	EPNG-28 C89054 Volatile Water None Cool	Halocarbons	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/17/89 06/20/89 NA 07/01/89
Farameter		Concentration	Det. Limit	Units
Chloromethane		ND	1.0	ug/l
Bromomethane		ND	0.t	ug∕l
Dichlorodifluoromet	hane	ND	1.0	ug∕l
Vinyl Chloride		ND	1.0	ug/l
Chloroethane		ND	1.0	ug/l
Methylene Chloride		ND	t . O	ug∕l
1,1-Dichloroethene		ND	1.0	ug/l
Trichlorofluorometh	ane	ND	1.0	ug∕1
1,1-Dichloroethane		ND	1.0	ug∕l
trans-1,2-Dichloroe	thene	ND ND	1.0	ug∕l
	Chloroform		1.0	ug∕l
	1,2-Dichloroethane		1.0	ug/1
1,1,1-Trichloroetha		ND	1.0	ug/l
Carbon Tetrachlorid		ND ND	t.0	ug∕l
	Bromodichloromethane		1.0	ug∕l
	1,2-Dichloropropane		1.0	ug∕l
	cis-1,3-Dichloropropene		1.0	ug∕l
trans-1,3-Dichlorop		ND	1.0	ug/l
Trichloroethene (TC		ND	1.0	ug/l
Dibromochloromethan		ND	1.0	ug/l
1,1,2-Trichloroetha		ND	1.0	ug/l
2-Chloroethylvinyl	ether	ND	1.0	ug/l
Bromoform		ND	1.0	ug∕l
1,1,2,2-Tetrachloro		ND	1.0	ug/l
Tetrachloroethene (PCE)	ND	1.0	ug/l
Chlorobenzene		ND	1.0	ug/l
1,3-Dichlorobenzene		ND	1.0	ug/l
1,2-Dichlorobenzene		ND	1.0	ug/l
1,4-Dichlorobenzene		ND	1.0	ug∕l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit.

ND - Parameter not detected at the stated detection limit Comments:

Felviewed by

Jack M. Morgan Organic Analyst

Client: KW Brown and Associates EPNG-2B Date Sampled: 06/17/89 Sample ID: 06/20/89 C89054 Date Received: Laboratory Number: Analysis Requested: 8020 Date Extracted: NA Sample Matrix: Water Date Analyzed: 07/01/89 Cool Preservative: Det. Parameter Limit Units Concentration ---------------------ug/l Benzene 1.6 0.20 0.20uq71 Toluene ND Ethylbenzene 0.20 ug/l 1.2 0.20 Chlorobenzene ND uq/l p,m-Xylene 10.8 0.20 ug/l 0.20 o-Xylene i.3 ug/l 1,4 Dichlorobenzene ND 0.40 ug/l 1,3 Dichlorobenzene 0.30 MD. ug/l 1,2 Dichlorobenzene ND 0.40 ug∕l

Report Date:

07/07/89

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

ack M. Morgan

Organic Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	EPNG-3 C89055 Volatile Water None Cool	Hald	ocarbons	Date Date	Sampled: Received: Extracted Analyzed:	: NA
Parameter		Cond	centration		Det. Limit	Units
Chloromethane			ND		1.0	ug/l
Bromomethane			ND		1.0	ug∕]
Dichlorodifluorometh	nane		ND		1.0	ug/l
Vinyl Chloride			ND		1 .O	ug∕1
Chloroethane			ND		1.0	ug∕1
Methylene Chloride			ND		1 . O	uç/l
1,1-Dichloroethene			ND		1.0	ug/l
Trichlorofluorometha	ane		ND		0.t	ug∕1
1,1-Dichloroethane			ND		1.0	ug∕1
trans-1,2-Dichloroe	thene		ND		1.0	ug∕l
Chloroform			ND		1.0	ug∕1
1,2-Dichloroethane			ND		1.0	ug/1
1,1,1-Trichloroethar			ND		1.0	ug/1
Carbon Tetrachloride			ND		1.0	ug∕l
	Bromodichloromethane		ND		1.0	ug∕l
1,2-Dichloropropane			ND		1.0	ug/l
cis-1,3-Dichloroprop			ND		1.0	ug/l
trans-1,3-Dichlorop			ND		1.0	ug/l
Trichloroethene (TCB			ND		1.0	ug/l
Dibromochloromethan			ND		1.0	ug/l
1,1,2-Trichloroetha			ND		1.0	ug∕l
2-Chloroethylvinyl (ether		ND		1.0	ug/l
Bromoform			ND		1.0	ug/l
1,1,2,2-Tetrachloro			ND		1.0	ug/l
Tetrachloroethene (P	PCE)		ND		1.0	ug∕l
Chlorobenzene			ND		1.0	ug/l
1,3-Dichlorobenzene			ND		1.0	ug∕l
1,2-Dichlorobenzene			ND		0.t	ug∕l
1,4-Dichlorobenzene			ND		1.0	ug∕l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Report Date: 07/07/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	EPNG-3 C89055 8020 Water Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/16/89 06/20/89 NA 06/29/89
Parameter		Concentration	Det. Limit	Units
Benzene		O. 4	0.20	ug∕l
Toluene		0.33	0.20	ug/l
Ethylbenzene		4.3	0.20	ug/l
Chlorobenzene		ND	0.20	ug∕l
p,m-Xylene		13.1	0.20	ug/l
o-Xylene		0.44	0.20	ug/l
1,4 Dichlorobenzene		ND	0.40	ug/l
1,3 Dichlorobenzene		ND	0.30	ug∕l
1,2 Dichlorobenzene		ND	0.40	ug∕l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Fyeviewed by

ganig Analyst

Client:	KW Brown	and	Associates	Report	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	EPNG-4 C89056 Volatile Water None Cool	Halo	ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/16/89 06/20/89 NA 06/30/89
Parameter			centration		Det. Limit	Units
Chloromethane			ND		1.0	 ug∕l
Bromomethane			ND		1.O	ug/l
Dichlorodifluoromet	hane		ND		1.O	ug/l
Vinyl Chloride			ND		1 . O	ug∕l
Chloroethane			ND		1.0	ug/l
Methylene Chloride			ND		1.O	ug/1
1,1-Dichloroethene			ND		1.0	ug∕l
Trichlorofluorometh	ane		ND		1.O	ug∕l
1,1-Dichloroethane			ND		1 .O	ug/l
trans-1,2-Dichloroe	thene		ND		1.0	ug∕l
Chloroform	Chloroform		ND		1.0	ug/l
1,2-Dichloroethane			ND		1.0	ug/l
1,1,1-Trichloroetha	ne		ND		1.0	ug/l
Carbon Tetrachlorid			ND		1.0	ug∕l
Bromodichloromethan	Bromodichloromethane		ND		1.0	ug∕l
	1,2-Dichloropropane		ND		1.0	ug∕l
cis-1,3-Dichloropro			ND		1.0	ug/l
trans-1,3-Dichlorop			ND		1.0	ug∕l
Trichloroethene (TC	E)		ND		1.0	ug∕l
Dibromochloromethan			ND		1.0	ug∕l
1,1,2-Trichloroetha			ND		1.0	ug/l
2-Chloroethylvinyl	ether		ND		1.0	ug/l
Bromoform			ND		1.0	ug∕l
1,1,2,2-Tetrachloro			ND		1.0	ug/l
Tetrachloroethene (PCE)		ND		1.0	ug/l
Chlorobenzene			ND		1.0	ug∕l
1,3-Dichlorobenzene			ND		1.0	ug/l
1,2-Dichlorobenzene			ND		1.0	ug/l
1,4-Dichlorobenzene			ND		1.0	ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

 ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Dack M. Morgan Organic Analyst
Report Date: 07/07/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	EPNG-4 C89056 8020 Water Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed: Det.	
Parameter		Concentration	Limit	Units
Benzene		0.95	0.20	ug/1
Toluene		ND	0.20	uq/l
Ethylbenzene		ND	0.20	ug∕l
Chlorobenzene		ND	0.20	ug/l
p,m-Xylene		ND	0.20	ug/l
o-Xylene		ND	0.20	ug∕l
1,4 Dichlorobenzene		ND	0.40	ug/l
1,3 Dichlorobenzene		ND	0.30	ug∕l
1,2 Dichlorobenzene		ND	0.40	ug/l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Faviewed by ck M. Morgan Organic Analyst

Client:	KW Brown	and	Associates	Report	Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	OCD-1 C89057 Volatile Water None Cool	Halc	ocarbons	Date R Date E	ampled: eceived: xtracted: nalyzed:	06/16/89 06/20/89 NA 06/30/89
Parameter		Conc	centration		Det. Limit	Units
Chloromethane Bromomethane Dichlorodifluorometh Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene Trichlorofluoromethane trans-1,2-Dichloroethane trans-1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethane 1,2-Dichloromethane 1,2-Dichloromethane 1,2-Dichloropropane cis-1,3-Dichloroprop	ane : hene ne : : :		ND ND ND ND 1.3 ND ND ND ND ND ND ND ND ND ND ND ND ND		1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	<pre>ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1</pre>
Trichloroethene (TCE Dibromochloromethane 1,1,2-Trichloroethan 2-Chloroethylvinyl e Bromoform 1,1,2,2-Tetrachloroe Tetrachloroethene (F Chlorobenzene 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene	:) e ether ethane		ND ND ND ND ND ND ND ND ND ND ND		1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Jack M. Morgan Drganic Analyst

Report Date: 07/07/89

Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	0CD-1 C89057 8020 Water Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/16/89 06/20/89 NA 06/30/89
		Det.	6 1 1 .
Parameter	Concentration	Limit	Units
••••••••••••••••••••••••••••••••••••••	T 6 Am.		
Benzene	ND	0.20	ug/l
Toluene	ND	0.20	ug∕l
Ethylbenzene	ND	0.20	ug/l
Chlorobenzene	ND	0.20	ug/l
p,m-Xylene	ND	0.20	ug∕l
o-Xylene	ND	0.20	ug/l
1,4 Dichlorobenzene	ND	0.40	ug/l
1,3 Dichlorobenzene	ND	0.30	ug/l
1,2 Dichlorobenzene		0.40	ug∕l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Jack M. Morgan Organic Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	OCD-2 C89058 Volatile Water None Cool	Halc	ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/16/89 06/20/89 NA 06/30/89
Parameter		Conc	entration		Det. Limit	Units
Chloromethane Bromomethane Dichlorodifluorometh Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene Trichlorofluorometh 1,1-Dichloroethane trans-1,2-Dichloroe Chloroform 1,2-Dichloroethane 1,1,1-Trichloroethane 1,1,1-Trichloroethane 1,2-Dichloromethan 1,2-Dichloropropane cis-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop trans-1,3-Dichloroprop	ane thene e e pene ropene E) e ne ether		ND ND ND ND ND ND ND ND ND ND ND ND ND N		1.0 1.0	ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1
1,1,2,2-Tetrachloro Tetrachloroethene (Chlorobenzene 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene			ND ND ND ND ND ND		$ \begin{array}{c} 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\$	ug/l ug/l ug/l ug/l ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit.

ND - Parameter not detected at the stated detection limit Comments:

Reviewed by

Jack M. Morgan Organic Analyst

Report Date: 07/07/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	OCD-2 C89058 8020 Water Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/16/89 06/20/89 NA 06/30/89
			Det.	
Farameter		Concentration	Limit	Units
anne este ante ante ente una mare une ster.		and any long and and also also and also also also also also also		······································
Benzene		ND	0.20	ug∕l
Toluene		ND	0.20	ug/l
Ethylbenzene		ND	0.20	ug∕l
Chlorobenzene		ND	0.20	ug∕l
p,m-Xylene		ND	0.20	ug/1
o-Xylene		ND	0.20	ug∕l
1,4 Dichlorobenzene		ND	O., 40	ug/l
1,3 Dichlorobenzene		ND	0.30	ug/1
1,2 Dichlorobenzene		ND	0.40	ug/l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

MM

Jack M. Morgan Organic Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	S-1 C89059 Volatile Water None Cool	Halo	ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/16/89 06/20/89 NA 06/30/89
Parameter		Cond	centration		Det. Limit	Units
Chloromethane			ND		1.0	ug/l
Bromomethane			ND		1.0	ug/l
Dichlorodifluoromet	hane		ND		1.0	ug/l
Vinyl Chloride			ND		1.0	ug∕l
Chloroethane			ND		1.0	ug∕l
Methylene Chloride			1.6		1.0	ug/l
1, 1-Dichloroethene			ND		1.0	ug/l
Trichlorofluorometh	ane		ND		1.0	ug∕l
1,1-Dichloroethane			ND		1.0	ug/l
trans-1,2-Dichloroe	thene		ND		1.0	ug∕l
Chloroform			ND		1.0	ug/l
1,2-Dichloroethane			ND		1 . O	ug/l
1,1,1-Trichloroetha			ND		1.0	ug/l
Carbon Tetrachlorid			ND		1 . O	ua/l
Bromodichloromethan	e		ND		1.0	ug/l
1,2-Dichloropropane			ND		1.0	ug/l
cis-1,3-Dichloropro			ND		1.0	ug/l
trans-1,3-Dichlorop			ND		1.0	ug/l
Trichloroethene (TC			ND		1.0	ug/l
Dibromochloromethan			ND		1.0	ug/l
1,1,2-Trichloroetha			ND		1.0	ug/l
2-Chloroethylvinyl	ether		ND		1.0	ug/l
Bromoform			ND		1.0	ug/l
1,1,2,2-Tetrachloro			ND		1.0	ug/l
Tetrachloroethene (PCE)		ND		1.0	ug/l
Chlorobenzene			ND		1.0	ug/l
1,3-Dichlorobenzene			ND		1.0	ug/l
1,2-Dichlorobenzene			ND		1.0	ug/l
1,4-Dichlorobenzene			ND		1.0	ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit. Comments:

Jack M. Morgan Organic Analyst

Report Date: 07/07/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	S-1 C89059 8020 Water Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/16/89 06/20/89 NA 06/30/89
			Det.	
Parameter		Concentration	Limit	Units
		anter were and have been taken to be and and and and and and and and and	anger child block anger cone	
Benzene		ND	0.20	ug∕l
Toluene		ND	0.20	ug/l
Ethylbenzene		ND	0.20	ug/l
Chlorobenzene		ND	0.20	ug/l
p,m-Xylene		ND	0.20	ug/l
o-Xylene		ND	0.20	ug∕l
1,4 Dichlorobenzene		ND	0.40	ug/l
1,3 Dichlorobenzene		ND	0.30	uq/l
1,2 Dichlorobenzene		ND	0.40	ug/l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

M. Morgan Ofganie Analyst

Client:	KW Brown	and	Associates	Repor	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	S-5 C89060 Volatile Water None Cool	Hald	ocarbons	Date Date	Sampled: Received: Extracted: Analyzed:	06/16/89 06/20/89 NA 06/30/89
Parameter		Conc	entration		Det. Limit	Units
Chloromethane			ND		1 O	ug/1
Bromomethane			ND		1 .O	ug/l
Dichlorodifluoromet	hane		ND		1 " O	ug/l
Vinyl Chloride			ND		1 . O	ug∕]
Chloroethane			ND		1.0	ug∕l
Methylene Chloride			ND		1.0	ug∕l
1,1-Dichloroethene			ND		1.0	ug/l
Trichlorofluorometh	ane		ND		1.0	ug/]
1,1-Dichloroethane			ND		1.0	ug/l
trans-1,2-Dichloroe	thene		ND		1.0	ug∕l
Chloroform			ND		1.0	ug∕l
1,2-Dichloroethane			ND		1.0	ug∕l
1,1,1-Trichloroetha			ND		1.0	ug/l
Carbon Tetrachlorid			ND		1.0	ug∕l
Bromodichloromethan	e		ND		1.0	ug∕l
1,2-Dichloropropane			ND		1.0	ug∕l
cis-1,3-Dichloropro	•		ND		1.0	ug/l
trans-1,3-Dichlorop			ND		1.0	ug∕l
Trichloroethene (TC			ND		1.0	ug/l
Dibromochloromethan			ND		1.0	ug/l
1,1,2-Trichloroetha			ND		1.0	ug∕l
2-Chloroethylvinyl	ether		ND		1.0	ug∕l
Bromoform			ND		1.0	ug∕l
1,1,2,2-Tetrachloro			ND		1.0	ug/l
Tetrachloroethene (PCE)		ND		1.0	ug/l
Chlorobenzene			ND		1.0	ug/l
1,3-Dichlorobenzene			ND		1.0	ug/l
1,2-Dichlorobenzene			ND		1.0	ug∕l
1,4-Dichlorobenzene			ND		1.0	ug∕l

Method 8010, Halogenated Volatile Organics, SW-846, USEPA Method: (Sept. 1986). ND - Parameter not detected at the stated detection limit.

Comments:

Jack M Morgan Drganic Analyst

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	8-5 C89060 8020 Water Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/16/89 06/20/89 NA 06/30/89
Parameter		Concentration	Det. Limit	Units
				alayah yayah sangar aggan bir a
Benzene		0.26	0.20	ug/l
Toluene		0.32	0.20	ug/l
Ethylbenzene		ND	0.20	ug∕l
Chloroþenzene		ND	0.20	ug/l
p,m-Xylene		ND	0.20	ug/l
o-Xylene		ND	0.20	ug/l
1,4 Dichlorobenzene		ND	0.40	ug/l
1,3 Dichlorobenzene		ND	0.30	ug/l
1,2 Dichlorobenzene		ND	0.40	ug/1

Report Date: 07/07/89

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

May-

Jack M. Morgan Organic Analyst

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	KWBA-1 C89061 Volatile Water None Cool	Halocarbons	Date Sampled: Date Received Date Extracte Date Analyzed	t: 06/20/89 ed: NA
Parameter		Concentration	Det. Limit	Units
Chloromethane	hane	ND	1.0	ug/1
Bromomethane		ND	1.0	ug/1
Dichlorodifluorometh		ND	1.0	ug/1
Vinyl Chloride		ND	1.0	ug/1
Chloroethane	ane	ND	1.0	ug/l
Methylene Chloride		ND	1.0	ug/l
1,1-Dichloroethene		ND	1.0	ug/l
Trichlorofluorometha		ND	1.0	ug/l
1,1-Dichloroethane	thene	ND	1.0	ug/l
trans-1,2-Dichloroet		ND	1.0	ug/l
Chloroform		ND	1.0	ug/l
1,2-Dichloroethane		ND	1.0	ug/l
1,1,1-Trichloroethar	2	ND	1.0	ug/1
Carbon Tetrachloride		ND	1.0	ug/1
Bromodichloromethane		ND	1.0	ug/1
1,2-Dichloropropane	ropene	ND	1.0	ug/1
cis-1,3-Dichloroprop		ND	1.0	ug/1
trans-1,3-Dichloroprop		ND	1.0	ug/1
Trichloroethene (TCB		ND	1.0	ug/1
Dibromochloromethane	ne	ND	1.0	ug/1
1,1,2-Trichloroethar		ND	1.0	ug/1
2-Chloroethylvinyl e		ND	1.0	ug/1
Bromoform		ND	1.0	ug/1
1,1,2,2-Tetrachloro		ND	1.0	ug/1
Tetrachloroethene (F		ND	1.0	ug/1
Chlorobenzene		ND	1.0	ug/1
1,3-Dichlorobenzene		ND	1.0	ug/l
1,2-Dichlorobenzene		ND	1.0	ug/l
1,4-Dichlorobenzene		ND	1.0	ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Organic Analyst

EONG-2A (Dup)

Report Date: 07/07/89

Client: KW Brown	and Associates		
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	KWBA-1 C89061 8020 Water Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	
Parameter	Concentration	Det. Limit	Units
Benzene	4.4	0.20	ug/l
Toluene	ND	0.20	ug/l
Ethylbenzene	22.2	0.20	ug/l
Chlorobenzene	ND	0.20	ug/l
p,m-Xylene	115	0.20	ug/l
o-Xylene	15.7	0.20	ug/l
1,4 Dichlorobenzene	ND	0.40	ug/l
1,3 Dichlorobenzene	ND	0.,30	ug/l
1,2 Dichlorobenzene	ND	0.40	ug∕l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEFA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Frequiewed by

Jack N. Morgan

Órganíc Analyst

Client:	KW Brown	and	Associates	Report	t Date:	07/07/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	KWBA-2 C89062 Volatile Water None Cool	Hald	ocarbons	Date f Date f	Sampled: Received: Extracted: Analyzed:	06/17/89 06/20/89 NA 07/01/89
Parameter		Cond	centration		Det. Limit	Units
Chloromethane Bromomethane Dichlorodifluoromet Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene Trichlorofluorometh 1,1-Dichloroethane trans-1,2-Dichloroe Chloroform 1,2-Dichloroethane 1,1,1-Trichloroethan Carbon Tetrachlorid Bromodichloromethan 1,2-Dichloropropane cis-1,3-Dichloropro trans-1,3-Dichloropro trans-1,3-Dichlorop Trichloroethene (TC Dibromochloromethan 1,1,2-Trichloroetha 2-Chloroethylvinyl Bromoform 1,1,2,2-Tetrachloro Tetrachloroethene (Chlorobenzene	ane thene ne e pene ropene E) e ne ether ethane		ND ND ND ND ND 1.2 ND ND ND ND ND ND ND ND ND ND ND ND ND		1.0 1.0	ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1
1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene			ND ND ND		1.0 1.0 1.0	ug/1 ug/1 ug/1

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Jack M. Morgan Organic Analyst

Report Date: 07/07/89

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	KWBA-2 C89062 8020 Water Cool		Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/17/89 06/20/89 NA 07/01/89
			Det.	
Farameter		Concentration	Limit	Units
Benzene		ND	0.20	uq/1
Toluene		ND	0.20	ug/l
Ethylbenzene		ND	0.20	ug/l
Chlorobenzene		ND	0.20	ug/1
p,m-Xylene		ND	0.20	ug∕l
o-Xylene		ND	0.20	ug∕l
1,4 Dichlorobenzene		ND	0.40	ug/l
1,3 Dichlorobenzene		ND	0.30	ug∕l
1,2 Dichlorobenzene		ND	0.40	ug∕l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Jack M) Morgan

Organic Analyst

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Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID:	NA		Date Sampled:	NA
Laboratory Number:	NA		Date Received:	06/20/89
Analysis Requested:	Volatile	Halocarbons	Date Extracted:	NA
Sample Matrix:	Water		Date Analyzed:	06/29/89
Preservative:	None			
Condition:	Cool			
			Det.	

Parameter	Concentration	Limit	Units
Chloromethane	ND	1.0	ug/1
Bromomethane	ND	1.0	ug/l
Dichlorodifluoromethane	ND	1.0	ug/l
Vinyl Chloride	ND	1.0	ug/l
Chloroethane	ND	1.0	ug/l
Methylene Chloride	1.2	1.0	ug∕l
1,1-Dichloroethene	ND	1.0	ug∕l
Trichlorofluoromethane	ND	1 . O	ug∕l
1,1-Dichloroethane	ND	1.0	ug/l
trans-1,2-Dichloroethene	ND	1.0	ug/l
Chloroform	ND	1.0	ug∕l
1,2-Dichloroethane	ND	1.0	ug∕l
1,1,1-Trichloroethane	ND	1.0	ug/l
Carbon Tetrachloride	ND	1.0	ug/l
Bromodichloromethane	ND	1.0	ug/l
1,2-Dichloropropane	ND	1.0	ug/l
cis-1,3-Dichloropropene	ND	1.0	ug/l
trans-1,3-Dichloropropene	ND	1.0	ug/l
Trichloroethene (TCE)	ND	1.0	ug∕l
Dibromochloromethane	ND	1.0	ug/l
1,1,2-Trichloroethane	ND	1.0	ug/l
2-Chloroethylvinyl ether	ND	1.0	ug/l
Bromoform	ND	1.0	ug/l
1,1,2,2-Tetrachloroethane	ND	1.0	ug/l
Tetrachloroethene (PCE)	ND	1.0	ug∕l
Chlorobenzene	ND	1.0	ug/l
1,3-Dichlorobenzene	ND	1.0	ug/l
1,2-Dichlorobenzene	ND	1.0	ug∕l
1,4-Dichlorobenzene	ND	1.0	ug∕l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit. Comments:

ick M. Morgan Grganic Analyst

**	QUALITY	ASSURANCE	REPORT
	TRAVEL	BLANK	

Client:	KW Brown	and Associates	Report Date:	07/07/89
Sample ID		NA	Date Sampled:	NA
Laborator		NA	Date Received:	
	Requested:		Date Extracted:	
Sample Ma		Water	Date Analyzed:	06/29/89
Freservat:		Cool	······································	
			Det.	
Parameter		Concentration	Limit	Units
Benzene		ND	0.20	ug∕l
Toluene		ND	0.20	ug/l
Ethylbenz	ene	ND	0.20	ug/l
Chloroben:	zene	ND	0.20	ug/l
p,m-Xylen	aan aast ma	ND	0.20	ug/l
o-Xylene		ND	0.20	ug/l
1,4 Dichle	orobenzene	ND	0.40	ug∕l
1,3 Dichl	orobenz <mark>e</mark> ne	ND	0.30	ug∕l
1,2 Dichle	orobenzene	ND	0.40	ug/l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

MU.

Dack M. Morgan Organic Analyst

Client:		and	Associates		Date:	07/07/89
Sample ID:	NA				ampled:	NA
Laboratory Number:	NA				ecei∨ed:	06/20/89
Analysis Requested:		Hal	ocarbons		xtracted:	NA
Sample Matrix:	Water			Date A	nalyzed:	06/30/89
Preservative:	None					
Condition:	Cool				7 . I	
		— ——			Det.	1.1
Parameter		Lon(centration		Limit	Units
Chloromethane			ND		1.0	ug/1
Bromomethane			ND		1.0	uq/1
Dichlorodifluoromet	hane		ND		1.0	ug/l
Vinyl Chloride			ND		1.0	ug/l
Chloroethane			ND		1.0	ug/l
Methylene Chloride			1.1		1 . O	ug/l
1,1-Dichloroethene			ND		1.0	ug∕l
Trichlorofluorometh	ane		ND		1 O	ug/l
1,1-Dichloroethane			ND		1.0	ug/l
trans-1,2-Dichloroe	thene		ND		1.0	uq∕l
Chloroform			ND		1.0	ug/l
1,2-Dichloroethane			ND		1. O	ug/l
1,1,1-Trichloroetha			ND		1.0	ug/l
Carbon Tetrachlorid	е		ND		1.0	ug/l
Bromodichloromethan			ND		1.0	ug/l
1,2-Dichloropropane			ND		1.0	ug/l
cis-1,3-Dichloropro	•		ND		1.0	ug/l
trans-1,3-Dichlorop			ND		1.0	ug/l
Trichloroethene (TC			ND		1.0	ug/l
Dibromochloromethan			ND		1.0	ug/l
1,1,2-Trichloroetha			ND		1.0	ug/l
2-Chloroethylvinyl	ether		ND		1.0	ug/l
Bromoform			ND		1.0	ug/l
1,1,2,2-Tetrachloro			ND		1.0	ug/l
Tetrachloroethene (F'CE)		ND		1.0	ug/l

1,1,2,2-Tetrachloroethan Tetrachloroethene (PCE) Chlorobenzene 1,3-Dichlorobenzene 1,2-Dichlorobenzene 1,4-Dichlorobenzene

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND

ND

ND

ND

ug/l

ug/l

ug/l

ug/l

1.0

1.0

1.0

1.0

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Jack M. Morgan Organic Analyst

Client: KW Brown and Associates Report Date: 07/07/89 Sample ID: NA Date Sampled: NA Laboratory Number: NA Date Received: 06/20/89 Analysis Requested: 8020 Date Extracted: NA Sample Matrix: Water Date Analyzed: 06/30/89 Preservative: Cool Det. Parameter Limit Concentration Units ---------Benzene 0.20 ND ug/l Toluene ND 0.20 ug/l Ethylbenzene ND 0.20 ug/l Chlorobenzene ND 0.20 ug/l p,m-Xylene ND 0.20 ug/l o-Xylene ND 0.20 ug/l 1,4 Dichlorobenzene ND 0.40 ug/l 1,3 Dichlorobenzene 0.30 ND uq/l 1,2 Dichlorobenzene ND 0.40 ug/l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Rexiewed by

Jack M. Morgan Organic Analyst



Client: Sample ID: Laboratory Number:	KW Brown NA NA	and	Associates	Date	t Date: Sampled: Received:	07/07/89 NA 06/20/89
Analysis Requested: Sample Matrix: Preservative:	Water None	Hal(ocarbons		Extracted: Analyzed:	NA 07/01/89
Condition:	Cool					
		_			Det.	
Parameter		Con	centration		Limit	Units
Chloromethane			ND		1.0	ug/1
Bromomethane			ND		1.0	ug/l
Dichlorodifluoromet	hane		ND		1.0	ug/l
Vinyl Chloride			ND		1.0	ug/l
Chloroethane		'	ND		1.0	ug/l
Methylene Chloride			1.2		1.0	ug/l
1,1-Dichloroethene			ND		1.0	ug/l
Trichlorofluorometh	ane		ND		1.0	ug/l
1,1-Dichloroethane			ND		1.0	ug/l
trans-1,2-Dichloroe	thene		ND		1.0	ug/l
Chloroform			ND		1.0	ug/l
1,2-Dichloroethane			ND		1.0	ug/l
1,1,1-Trichloroetha	ne		ND		1.0	ug/l
Carbon Tetrachlorid	e		ND		1.0	ug∕l
Bromodichloromethan	e		ND		1.0	ug/l
1,2-Dichloropropane			ND		1.0	ug∕l
cis-1,3-Dichloropro			ND		1.0	ug/l
trans-1,3-Dichlorop			ND		1.0	ug∕l
Trichloroethene (TC			ND		1.0	ug∕l
Dibromochloromethan			ND		1.0	ug/l
1,1,2-Trichloroetha			ND		1.0	ug∕l
2-Chloroethylvinyl	ether		ND		1.0	ug/l
Bromoform			ND		1.0	ug/l
1,1,2,2-Tetrachloro			ND		1.0	ug/l
Tetrachloroethene (PCE)		ND		1.0	ug/l
Chlorobenzene			ND		1.0	ug/l
1,3-Dichlorobenzene			ND		1.0	ug/l
1,2-Dichlorobenzene			ND		1.0	ug/l
1,4-Dichlorobenzene			ND		1.0	ug/l

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986). ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by M. Morgan аCЕ Urgadic Analyst

Client: KW Brown and Associates Report Date: 07/07/89 Sample ID: NA Date Sampled: NA Laboratory Number: NA Date Received: 06/20/89 Analysis Requested: 8020 Date Extracted: NA Sample Matrix: Water Date Analyzed: 07/01/89 Preservative: Cool Det. Parameter Concentration Limit Units ---------------ND 0.20 uq/1Benzene 0.20 Toluene ND. uq/l Ethylbenzene ND 0.20 ug/l Chlorobenzene ND 0.20 uq/l p,m-Xylene ND 0.20 ug/l 0.20 o-Xylene ND ug/l 1,4 Dichlorobenzene ND 0.40 ug/l 1,3 Dichlorobenzene 0.30 ND uq/l 1,2 Dichlorobenzene ND 0.40 uq/l

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEFA (Sept. 1986).

ND - Farameter not detected at the stated detection limit.

Comments:

Jack M. Morgan Organic Analyst

Client: KW Brown and Associates Report Date: 07/07/89 Sample ID: OCD-1 Date Sampled: 06/17/89 Laboratory Number: C89057 06/20/89 Date Received: Analysis Requested: Volatile Halocarbons Date Extracted: NA Sample Matrix: Water Date Analyzed: 06/30/89 Preservative: None Condition: Cool

	Spike	Sample	Spiked	Percent
Parameter	Added	Result	Sample	Recovery
Name and the second stages over a same allow allow				
1,1,2-Trichloroethane	20.0	ND	18.7	93.3
1,2-Dichloroethane	20.0	ND	17.2	84.9
Tetrachloroethene	20.0	ND	21.1	105
1,1,2,2-Tetrachloroethane	20.0	ND	17.1	85.4

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/l.

/M. Morgan lack, Organic Analyst



Client: KW	Brown and Ass	ociates	Repor	-t Date:	07/03/89
Sample ID: Laboratory Num Analysis Reque Sample Matrix: Preservative:			Date Date	Sampled: Received: Extracted: Analyzed:	06/16/89 06/20/89 NA 06/30/89
Parameter	Spike Added	Sample Result	Spiked Sample Result	Percent Recovery	
Benzene	20.0	ND	20.8	104	
Toluene	20.0	ND	23.2	116	
Ethylbenzene	20.0	ND	21.6	108	
Chlorobenzene	20.0	ND	20.9	105	

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/1.

11/1/

Jack M. Morgan Organic Analyst

Client: KW Brown and Associates

Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	Halocarb	ons	Date Date	Extra	ved: acted:	06/17/89 06/20/89 NA 07/03/89
	Snike	Sample	Snike	-d	Perce	nt-

Report Date: 07/07/89

Added	Result	Sample	Recovery
			-
20.0	ND	20.3	102
20.0	ND	20.1	101
20.0	ND	19.8	99
20.0	ND	16.7	83.5
20.0	ND	17.2	86
20.0	ND	19.3	96.5
	Added 20.0 20.0 20.0 20.0 20.0 20.0	Added Result 20.0 ND 20.0 ND	AddedResultSample20.0ND20.320.0ND20.120.0ND19.820.0ND16.720.0ND17.2

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/l.

Reviewed by

M/H

Jack/M. Morgan Organic Analyst

Client: KW Brown	and Associates	Report Date:	07/03/89
Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative:	EPNG-28 C89054 8020 Water Cool	Date Sampled: Date Received: Date Extracted: Date Analyzed:	06/17/89 06/20/89 NA 07/01/89
Parameter	Spike Sample Added Result	Spiked Sample Percent Result Recovery	/
Benzene Toluene Ethylbenzene Chlorobenzene	20.0 1.6 20.0 ND 20.0 1.2 20.0 ND	21.599.320.110321.210020.1100	1

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments: All concentrations in ug/1.

Reviewed by

Jack M) Morgan Organic Analyst

** QUALITY ASSURANCE REPORT FIELD DUPLICATE

Parameter Concentration Limit Units	Client: Sample ID: Laboratory Number: Analysis Requested: Sample Matrix: Preservative: Condition:	EPNG-4 C89056		Associates ocarbons	Date Date Date	t Date: Bampled: Received: Extracted: Analyzed:	07/07/89 06/16/89 06/20/89 NA 06/30/89
ChloromethaneND1.0ug/lBromomethaneND1.0ug/lDichlorodifluoromethaneND1.0ug/lVinyl ChlorideND1.0ug/lChloroethaneND1.0ug/lMethylene ChlorideND1.0ug/lTrichloroethaneND1.0ug/l1,1-DichloroethaneND1.0ug/lTrichlorofluoromethaneND1.0ug/l1,i-DichloroethaneND1.0ug/l1,i-DichloroethaneND1.0ug/l1,2-DichloroethaneND1.0ug/l1,2-DichloroethaneND1.0ug/l1,1,1-TrichloroethaneND1.0ug/l1,1,2-DichloropethaneND1.0ug/l1,2-DichloropethaneND1.0ug/l1,3-DichloropropeneND1.0ug/l1,2-DichloropropeneND1.0ug/l1,2-DichloropropeneND1.0ug/l1,2-DichloropropeneND1.0ug/l1,1,2-TichloroethaneND1.0ug/l1,1,2-TrichloroethaneND1.0ug/l1,1,2-TrichloroethaneND1.0ug/l1,1,2-TrichloroethaneND1.0ug/l1,1,2-TrichloroethaneND1.0ug/l1,1,2-TrichloroethaneND1.0ug/l1,1,2-TrichloroethaneND1.0ug/l	Parameter		Conc	entration			Units
2-Chloroethylvinyl etherND1.0ug/lBromoformND1.0ug/l1,1,2,2-TetrachloroethaneND1.0ug/lTetrachloroethene (PCE)ND1.0ug/lChlorobenzeneND1.0ug/l1,3-DichlorobenzeneND1.0ug/l1,2-DichlorobenzeneND1.0ug/l1,4-DichlorobenzeneND1.0ug/l	Bromomethane Dichlorodifluoromet) Vinyl Chloride Chloroethane Methylene Chloride 1,1-Dichloroethene Trichlorofluorometh 1,1-Dichloroethane trans-1,2-Dichloroethane 1,2-Dichloroethane 1,2-Dichloroethane 1,1,1-Trichloroethan Carbon Tetrachlorid Bromodichloromethan 1,2-Dichloropropane cis-1,3-Dichloropro trans-1,3-Dichloropro trans-1,3-Dichloropro Trichloroethene (TCD Dibromochloromethan 1,1,2-Trichloroethan 1,1,2,2-Tetrachloro Tetrachloroethene (I Chlorobenzene 1,3-Dichlorobenzene 1,2-Dichlorobenzene	ane thene ne e pene ropene E) e ne ether ethane PCE)		ND ND ND ND ND ND ND ND ND ND ND ND ND N		$ \begin{array}{c} 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\ 1.0\\$	<pre>ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1 ug/1</pre>

Method: Method 8010, Halogenated Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit. Comments:

Reviewed by

Dack M. Morgan Organic Analyst ** QUALITY ASSURANCE REPORT FIELD DUPLICATE

KW Brown and Associates Report Date: Client: 07/07/89 Sample ID: EPNG-4 Date Sampled: 06/16/89 Laboratory Number: C89056 Date Received: 06/20/89 Analysis Requested: 8020 Date Extracted: NA Sample Matrix: Water Date Analyzed: 06/30/89 Preservative: Cool Det. Parameter Limit Units Concentration -----____ _____ ------0.20 Benzene 0.76 uq/l Toluene ND 0.20 ug/l Ethylbenzene ND 0.20 ug/l Chlorobenzene ND 0.20 ug/l 0.20 p,m-Xylene ND ug/l o-Xylene ND 0.20 ug/11,4 Dichlorobenzene ND 0.40 ug/l 1.3 Dichlorobenzene 0.30 ug/l ND 1,2 Dichlorobenzene ND 0.40 uq/1

Method: Method 8020, Aromatic Volatile Organics, SW-846, USEPA (Sept. 1986).

ND - Parameter not detected at the stated detection limit.

Comments:

Reviewed by

Jack M. Morgan Drganic Analyst APPENDIX I Boring Logs/Well Construction Diagrams

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A Design Specifications	Elevations: 1 5486.97 2 5487.03	3 5483.88	4 Coordinates: N 10254.10 E 10214.39	Type of Casing: X PVC Sched. 40 Flush Thread	Coning Diamator: [X] 2"] 2"] 2"] 6				Sand Pack: #10 Colorado Silica Sond	Bentonite Seal: 1/2" Pellets Hole Plug Slurry	⊠1/4" Pellets □	Grout Type: Portland & II Weight:	Drill Ria: CHallow Stem SRatary	Drilled By: MO-TE, Farmington, NM	Logged By: <u>S. Johnson</u> Completion Date: 6–14–89	Date D_T_W MSI Date Field FC	80 8.03 5.470.00 6.16.80 7.45 1600	8.47 5478.56 6-16-89 7.45	- 6-16-89 8.39 5478.64 6-17-89 NA 2000-4		Comments: Purged 50 gallons from well during	development.		14L	MONITORING WELL EPNG-1	Project: EPNG Flora Vista 63712 Location: Flora Vista, NM	K.W. BROWN & ASSOCIATES, INC.
Monitoring Well Piezometer	Protective Casing No	1					``	* * * * * * * * *	* * *	* * *	× × × × × ×	* * *	* * * * *	x x x	× * * * * * *	* * * * * <u>*</u> * * <u>*</u>	* *	(*************************************	- 2.0		C.4			C'f		Depths in Feet from Ground Surface	(Not to Scale)
Geologic Description	0'-1' Sandy Loam Top Soil	1'-10' Sand/Gravel/Cobbles;	Very Poorly Sarted; Cobbles Up To 10" In Diamotor									TD = 10 [°]															ST=Shelby Tube SS=Split Spoon C=Cuttings
(1597) (1297) (1297) ग्रेन्ड्र ग्रेन्ड्र		C	~	~ +	4	+2	ین +	 	\ +	αο 	+		+		<u></u>	; ↓	 <u>↓</u> ↓	+ 15	+ 16	+ 17	+ 1 8	+ 19	- 20	 + 22	+ 23		+ 25

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Design Specifications	}	Type of Casing: 🖂 PVC Sched. 40 Flush Thread 🗌 Casing Diameter: 🖾 2" 🗌 3" 🗌 4" 🗍 6" 🗍	Type of Screen: 0.008 X0.010	Sand Pack: #10 Colorado Silica Sand	Bentonite Seal: []1/2" Pellets []Hole Plug []1/4" Pellets []	Grout Type: <u>Portland I & II</u> weight: Bore Hole Diameter: 5 5/8"	Drill Rig: Hollow Stem Ratary Drilled By. MO-TE, Farmington, NM Logged By. S. Johnson Completion Date: <u>6-14-89</u>	D-T-W MSL Date	6-15-89 8.19 5478.35 6-17-89 7.52 6-15-89 8.50 5478.04 6-17-89 7.55 2.5' 6-16-89 7.96 5478.58 7.55	4.5'	Comments: Purged 40 Gallons From Well During Well Development.	10.0' EI PASO NATURAL GAS CO	MONITORING WELL EPNG-2A	Project: EPNG Flora Vista 63712 ce Location: Flora Vista, NM
Monitoring Well Piezometer Protective Casing No	\neg \setminus \downarrow			* * * * * * * * * * * *		* * * *	× × × × × × × × × × × × × × × × × × ×	* * *		5.0'				Depths in Feet from Ground Surface
Geologic Description	Sandy Loam Top Soil Sand/Gravel/Cobbles; Very Poorly Sorted; Cobbles Up to 10" In Diameter	Black Staining Noted At A Depth Of Approximately 5'.				TD = 10'								

Specifica	Elevations: 1 5485.67 2 5485.68 3 5482.89 4 5482.92	N 10080.56 E	Type of Casing: 🔀 PVC Sched. 4t Flush Thread	Casing Diameter: 🖾 2" 🖂 3" 🖂 4 🗍 6" 🗍	Type of Screen: 0.008 × 0.010	Screen Style: 🛛 Machine Slot 🗍 Wire Wrap	Sand Pack: #10 Colorado Silica Stind	Bentonite Seal: 🔲1/2" Pellets 🗌 Hole Plug 🛄 Slurry	⊠1/4" Pellets □	Grout Type: Portland I & II Weitht:	Bore Hole Diameter: ~~/~	Drittad By: MO-TF Formination 20	S. Johnson	Date D-T-W MSI Date Field pH Field EC	89 7.16 5478.52 6-17-89 7.55 1	7.19 5478.49 6-17-89 7.52	6-16-89 7.10 5478.58 6-17-89 7.44 1600 L		Comments: Purged 45 Gallons Duiñg	Well Development.			EI PASO NATURAL GAS CO.	MONITORING WELL FONG-JR	2		K.W. BROWN & ASSOCIATES, INC.
	Protective Casing No 255	3				× × × × × ×	* *	* * *	× × ×	* * *	* * *	× × ×	× × × ×	* * * * * * * * * * *	× * , * x * y	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	8.0	11.0	0.71				17.0'		Depths in Feet	from Ground Surface	Not to Scale)
Geologic Description	ŝ		Black Staining Nated At A Depth Of Approximately 5'.																		$TD = 20^{\circ}$						ST=Shelby Tube SS=Split Spoon X C=Cuttings
(təət) Depth (MSL) Depth Xec		+ 2	₩ -	4	یں +	9-+	4	σ <u>ο</u> +	σ +	, <u>5</u>	2 5	= 	+ 12	+	<u>+</u> 	+	+ 16	+ 17	<u>∞</u> +	ouniti + - 13	+ 20	+	- c	77 5	+ 23	- 24	+ 25

Design Specifi	Elevations: 1 5484. 3 5481. Coordinates: N 10 Type of Casing:	Casing Diameter: 🖾 2" 🔲 3" 🗍 4" 🗍 6" 🗍 Casing Diameter: 🖾 2" 🗍 3" 🗍 4" 🗍 6" 🗍 Type of Screen: 🗍 0.008 🖾 0.010 🗍 Screen Style: 🖾 Machine Slot 🗍 Wire Wrap	Bentonite Seal: 1/2" Pellets Hole Plug Slurry X1/4" Pellets Grout Type: Portland <u>1 & ll</u> weight: Bore Hole Diameter: <u>5 5/8"</u> Drill Rig: Hollow Stem XRotary Solid Auger	S. Johns Date: <u>6-</u> 1- W 1- T - W 1.97 54 03 54 93 54	s: Purged 80 Gallons From Well	EI PASO NATURAL GAS CO. MONITORING WELL EPNG-3 Project: EPNG filora Vista 63712 Location: Flora Vista, NM K.W. BROWN & ASSOCIATES, INC.
	Protective Casing No 20		× * * * * * * * * * * * * * * * * * * *		3.0'	7.0' Depths in Feet from Ground Surface (Not to Scale)
Geologic Description	0'-2' Sand/Gravel/Cobbles 2'-4.5' Sandy Clay? Reserv Pit Cuttings? 4.5'-8' Sand/Gravel/Cobbles Black Staining Noted At 5'		TD = 8.0'			ST=Shelby Tube SS=Split Spaan C=Cuttings
Meet) Samp Samp Samp Samp Samp	- 7 % + + + +	→ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	<u> </u>	+ + + + + + + + + + + + + + + + + + +		21 22 24 25 24 25 24 25 24

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Design Specifi	Yes Elevations: 1 5483.83 2 5483.87 3 5480.50 4 5480.45 4 Coordinates: N 9954.27 E 10067.09	Type of Casing: A PVC Sched. 40 Flush Thread Stainless Steel C Casing Diameter: 2"] 3"] 4"] 6"	Type of Screen: 0.008 🛛 0.010 🗍 Screen Style: 🖾 Machine Slot 🗍 Wire Wrap 🗍 Sand Pack: #10 Colorado Silica Sand	Bentonite Seal: 🗌1/2" Pellets 🗌 Hole Plug 🗍 Slurry 🖾1/4" Pellets 🗍	Grout Type: <u>Portland & II</u> Weight: Bore Hole Diameter: <u>6 1/2</u> Drill Rig: <u></u> Hollow Stem <u></u> Rotary <u></u>	<u>MO-TE, Farm</u> S. Johnson Date: <u>6-14-</u>	Date D-T-W MSL Date Field pH Field EC 6-15-89 6.22 5477.65 6-16-89 7.10 1700 ut	1.5 ⁴ 6-15-89 6.30 5477.57 6-16-89 NA 1800 U	2.5'	velopment.		8.0' EI PASO NATURAL GAS CO.	MONITORING WELL EPNG-4	Project: EPNG Flora Vista 63712 ce Location: Flora Vista, NM	
	Protective Casing I No			* * * * *	* * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * *	* * * * * * * * * * * *				· · · · ·			Depths in Feet from Ground Surface	(Not to Scale)
Geologic Description	0'-8 1/2' Sand/Gravel/Cobbles; Coarse Grained Sand; Very Poorly Sorted; Cobbles Up To 12" Diameter.			TD = 8.5'											ST=Shelby Tube SS=Split Spoon X C=Cuttings
my2) (1991) (1991) (1991) (180) (1997) (1997) (1997) (1997)		00000 Cuttings.	→ ∞ ∩ + + + + + + + + + + + + + + + + + + +	000	+ 10	+ 12	+ 14	+ + +	+ +	- 19	+ 20	5 ŝ	+ 23	+ 24	- 25 -



P. O. BOX 4990 FARMINGTON, NEW MEXICO 87499 PHONE: 505-325-2841

June 30, 1989

Received

JUL 1 0 1989

OIL CONSERVATION DIV.

Mr. Dave Englert New Mexico Oil Conservation Division 310 Old Santa Fe Trail Santa Fe, New Mexico 87504

Re: Flora Vista Groundwater Investigation

Dear Mr. Englert:

Enclosed is a copy of the field notes that K. W. Brown gathered during their investigation at the Flora Vista Site.

K. W. Brown is currently working on organizing the material they collected in the field. Laboratory results from Intermountain Laboratory should be available by mid-July.

If you have any questions concerning the project, please call me at 599-2176.

Sincerely,

anu N. Pundari

Anu N. Pundari Compliance Engineer

anp

Enclosure

cc: K. E. Beasley, III

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SARKING ON -SITE C 1:20 PM	BREK ON STREE 1:00 PM	5-6 - M. 2 (ACTIVELY POMPING - WELLTERD SEALED) - T. 19 (IMACTIVE - WELLTERD SOLVED BUT LOSSE) 5-7 - SURVEY (METVELY POMPING - WELLTERD SOLVED) 5-7 - M. 21 (METVELY POMPING - WELLTERD SOLVED)	S-\$4 5-\$4 5.5 6.92 99.45 92.53	(10:30 m) WILL D.T.W T.C. GN.ET. DATE I.D. (1007) (17, MSL) (17, MSL) 6-12-83 6CD-1 6.32 100.61 94.29 CCD-2 (WAL SIGTED IN) N/A CCD-3 6.33 101.90 95.57 CCD-4 (WAL SIGTED IN) N/A OCD-5 4.85 100.18 95.33 S-1 5.35 100.48 95.13 SX-1 4.717 99.74 94.97 SX-1 4.717 99.74 94.97 SX-2 (CASING WIED-ID SHUT) D-X 2 (ATIVELY PIMPING - WIELHERD SEALED)
Allion 12 Les EVELED BY EVENES DESTRICT	ALFA	A REAL EDVA	EXCAVATION WAS INTITLED FROM EAST TO WOST. EXCANATION TERMINITED AFER AD REST TO WOST.	1.26 MARTER ALL (T-1) (6-12-89 1.26 MARTER ALL (T-1) 1.26 MARTER

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	TRENCH BACK-FILLING & COMPACTION COMPLETE C. 14:45,
RUAD & PRICEEDED FROM WET TO CAST.	WERE FILLED IMMEDIATELY.
31 EXCAVATION STARIED ABOUT 12 FEET WEST OF	ALL SAMPLES WERE TAKEN W/SALTHEE, AND YOA VIALS
ZNº EXCAVATION MADE FROM WEST TO EAST.	
EXCAVATION.	* ARIONS INDICATE DIRECTION OF EXCANATING EXC.
22 LITTLE, IF ANY, HYDROGHEDEN STAINING IN THE 2ND	~ LISTER
	N A BXC. OV I DO RAT
	0.5:40
T=2 (CENTER) @ 17:25	22-
2 L 212 L 24	14
	× 10 2 - ×
	34 EXCAVATION DID NOT REVEAL PRESENCE OF HORDCANGONS.
N N N N N N N N N N N N N N N N N N N	30 PLET EAST OF TEXMIN'S OF 200 EXAVATION.
	3 ¹ EXCANATION INTIFIED FROM EAST TO WEST STARTING
TANK TANK	NGH
Pledked	2ND EXCAVANON TERMINATED AFTER 33 FEET : AVIDENCE
FIRST APPEARANCE OF HOROCARBON.	2 m EXCANATION RECEPTED FRAM WEST TO EAST.
RESSIBLE THAT GILDUNDWARENC IS ABOUT GIN BELOW	DAVE THE (OCD) ON -SITE @ # 3:00 PM.
OF IMDROCAZEONS ARE COINCIDENT (i.e., @ > 4 FEET).	FORTHER DISTURBANCE OF THE LINE.
IT APPEARS THAT GROWNDWATER & FIRST APPEARANCE	Soil Floor Alound PIPELINE AS RESSIBLE W/C INDUCING
DIFFICULT TO DISCERN A ZONE OF HORIGARDON STAINING.	BRUTE OPERATOR ATTEMPTED TO LEMONE AS MUCH
FEWER COBSLES NOTED THAN AT T-1.	KASESS DUE TO CONSTANT INALLY OF GRUNDWATER.
OL FILST ENCONTRAD @ X 4 FEET.	VERTICAL EXTENT OF OIL IS VERY DIFFICULT TO
	BACKHUE OPERATOR STRUSSED PIPELINE.
	SOME TYPE OF VENT LINE. (REGABLY OWNED BY MANANA).
TRENCH #2 (T-2) 5:00 PM	

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TRENCH BRK-FILLING & COMPLETION COMPLETE @ CX:40.	
abundwhere first where a new 4 feet.	
34 EXAMPTION RECEDED FROM WEST TO EVEN.	
NO VISUAL EVIDENCE OF STAINING IN 3RD EXCANATEN.	
of (seekers.	@ 18:40, ·
30 EXCAVATION NOTED MOSTLY SAND Y LESSER AND NT	TRENCH BACK-FILLING & CONTINCTION COMPLETE
ALWNDWATEL FIRST SEEN & AROUT 45 FEET.	will be seen.
@ freet_ material Similar TRO 13 EXCAVATION	BETWEIN THE STAINED & THE UNSTAINED SOIL
2 NO EXCAVATION NOTED HEAVY AXORCAREON STAINING	CONDITIONIS, IT IS LIKELY THAT NO CONSTRATES
2 ND EXCAVATION PROCEEDED FROM WEST TO DET.	EXPOSED TRENCH PARE, AND TO POOR LIGHTING.
	ANALE BETWEEN THE CAMERA AND THE
	WARCHADE, HOWAVER, DUE TO THE SMARP
9 12 / Alexandre 1-8 8 08:00	PRETECTANTS OF TRANSTES T-1 1T-2
	CAINGOW SITEEN ON WATER SUIZARE,
1 10 01.15 V	GLOUNDWATEL FIRST APPEARED & > 6 FORT.
$Fxc = SAMPLE \left(\begin{bmatrix} T-3 \\ Exc \end{bmatrix} \right)$	HOLOCAREONS FILST DEPETED @ 7 X FRET.
$\frac{1}{121}$	340 EXCAVATION THAN IN 2M 5
	COBLES MARE PRESIENT (AND LARGER) IN
A Preserved	(C) (B) (C) (C) (C) (C) (C) (C) (C) (C) (C) (C
No VISCAL EVIDENCE OF HIDLE ACBENS.	OFF HERE SAMPLE
	A COZ
WELL BOUNDED COSELES (UP TO 12 IN. 4).	1 1 300
EXCAVATED MATERIAL IS A LOAMY SAND W LARGE	
151 EXCANATION MOCEDED FILM ETER TO WEST.	
TRENCH #3 (T-3) 7:3 AM	
6/13/02 ON STRE @ 7:30 AM	
WEATHERL: MOSTLY SUNNY, CALM WINDS, Los F	

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(BACHER OPERATOR BAKE FOR WACK @ 11:15)	GRAVELY SAND IS OLIVE W/ ABUNDANT BLACK CREAMIC
TRENCH PRAK-FILLING & COMPARTION COMPLETE & 11:15.	SAND STRATING @ 2000 (GIECHLAMATER @ THIS LEVEL)
A. THE 1ST EXCAVATION.	Sold is very Moist, chiter SAND TO 2 FEBT GRAVELY
STH EXCAVATION SHOWED SIMILY APOLOGIC CONDITIONS	2nd excavation :
No Siteen on Water Sucracy.	the Tenence
No EVIDENCE OF HOR CARBON PRASPIT.	SX-1 EXCAVATIONS
	1 10 45
KAN STAINS BEGINS APPEND. 6-5 IN. ABOVE GROUNDWATER	V A A A
Defit To Greenow Area Applex 3 FRAT.	I Charles and the second secon
TO SURPRE.	N PK. ET.
AT EXCANATION SHEWED CONTRY SAND W/ COBOLES	
ANDALONT: STRATIGIZANINC CONDITIONS SIMILAR.	S-1 cxD-4
DECIDED TO CONNECT EXCANATIONS 1 1 2, NO STAINING	No YISOAL EVIDENCE OF HOROCARBON STAINING IN 12 EXC.
Ele: 10 Month Charles APIAGENT IN SUCH MATER IS CLAR.	
- (8) - (8)	of 131 EXC
2 Serce 2. 1 1	Septer Septer
	Curr Curr
N 0 35- V C F.4 (centre)	SAMAL SAMAL
	A consist
1 DiscHARGE AREA	wast 12'
1 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SANDY CUAY @ NEWT 2 REPT.
35 FEET EAST OF ROAD:	ABOUT 2.5 FEET.
THE NORTH OF T-4; GEET & ZHET; MIKEY.	GROUND WATTER ECCAN SEERING INTO EXCAVATION &
SMALL GREINDWARG DISCHARGE AREA NOTED TO	PERCENTAGE OF CARGUES.
WHER 2 FORT PROJABLY REPRESENTS OVERGANK DEPOSITS,	15 EXCANATION: MATERIAL IS MOIST CONSE SAND W/SMAL
FINER COBOLLS ABUNDANT IN GILAVELLY SAND.	
NO HIDRECARDON CADIL PRESUNT.	TRANCH #4 (T-4) 9:05M

Class-Seation of Alench	CLEAN STAINING SAND & COEBLES	A 16 X	Saver /	STAINING IS BUE BUEL. NOGH	CIRNINATUS FIRST ECEN @ 5.4 MERT	Foul cool Emphating From Exchurton.	HEAVY HOROCALON STAINING & TOAT 12 IN.	COARSE SAND IN/LARGUE CORSLES.		BLAID'S HELE PLUMG	LIMITS OF FIRST NOTED	HOUS CARES	A around the	N X GATOLATED	lex S	A 12 / States		EXCAVATION OF OLD DEHMORATIC PT 13:15		BACK ON-SITE @ 1:10 PM.	BREKE FOR WACH @ 12:20 AM.	WAS NOT SUCCESSFUL IN GETTING PUMP TO WOLK.	SERVED CENTRIFUGAL PUMP FOR PUMPING 5-5.	
TRENCH BACK-FILLING & COMPACTION COMPLETE C	12) Excavation				Contraction of the second	- 12no exc.	1-IN, PIPELINE WAS INADVERTANTLY EXCANATES OVEING	@14:50 Exc.	A SAMPLE	a same	e 14:45	A A A A A A A A A A A A A A A A A A A			K/ K		T (NJGTH)	WAS RINE TRANSVERSE to THE 15	2ND EXCAYATION RECEIDED FROM WEST TO EAST		BREN EXTERED BY THE BACK HOE.	. IT A MEAR THAT THE BETTEN OF THE PIT IND	to excanation plucered Front North	
LAR C 15:45	Excavation	5. J. Y			ti .		WATED OUR ING THE					SAMPLE AT (CART)	- CT EXC.			SHARK	/	TER.:	ST TO EAST AND			THE PTT HAD	whith the south,	

Town I want I	TRENCH SUFFLUONTLY CLEANED THE BACUTOR
	2. It was belided that skel filling of early
	cleaning was done.
	SOL FISH PROVING SITE WILLY NO STORM -
PLIME	EXCAVATION AND WAS REVIND TO BE TRAE OF
The state of the s	1. BACKTOG BULLAT WAS INSPECTED PRIOR TO ANY
	MISCELANERUS NONZ:
	e sico m
	ABANDOR AMPINA OF S-S OVE TO ANUT BOUIDAENT.
1	
1	BAY- CULING & CARAMAN (AND TO V-1)
WEATHER: OVERCAST, CALM WINDS, 60°F	BUSZ BURK STAINING JAMAINY @ STEET.
Delues en stre 7.45 m	Found @ this lever this).
6/14/22 CN-SITE @ 7:30 AM	LADDE COBLES STADING & ABOUT 3 FEET (GLOUNDWATER
	MORST BROWN LOAMY SAND W/SMALL PRECONTAGE OF CREAKS.
TO BE LEAKING FROM THE STREET.	EXCAVATION PROCEED FROM South TO NORTH.
A. NO CILS OF HYDRAULL FLUIDS WERE TECHD	
ADMS CLEAR GLASS YIAL W TERM SEAM	
ZIP-LEC BAG	I i Amaa to A
250 ml Amour and (auric)	N VIS- TANK
Following Contrinces:	
3. SAL SAMILES WERE PLACED INTO THE	
BETWEEN TRENCHES.	
BUCKET TO WARRANT NET STEAM CLEANING	TRANCH (ELSE OF DEMNAROL PIT) (T-S) \$15:45
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6-14-89 MONTERING WELT 1: EPNG-1 ENA WORKER EN-STRE TO CHEEK PERESCO DRUINA LOCATIONS FOR SULLED PIPELINESS Sterted drilling @ 8:40 am Zilled the pit /2 way w/ bestruite slung. Drilled with a 5% "bit. Circulated entiting to depth of 10'. Set well a #' = 9.5' Casing and back washed bore half to Reamed hale w/ 61/4" bit. Set 4" PEV will in side Set sand pack inside of well casing inside of 4" casing. Completed. 2'- 1/4" fellets (1/2 bucket) 2+ bago of # 10 sand Type D&I Bortland cement. semore benterite mud. Set 2" monitoring out of bore hole. Sand and gravel / abbles 4". Sand pack was #30 sand, but was too fine grained for 0.010 sorren. Blue sand out and used a # 10 sand Dark Set square stul protective collar in 2' Vinished (a) 11:50 RAKGROCHD (8:20) , 26.21 10:46 6/14/09 Wed Set up 85 and/min trash pump @ 10:45. First surch surge of water from well was black. No hyprocarbon ador was moted; appeared Within Zminute water was clear. Fine was introurn. Anount Well caring was open j no cour for actennined. Estimated amount Approx. pumpingrate = 70 gul/min of water removed can not be the well was seen. Flora Vista Well 5-5 >1,000 gallons

23-4 5 Sump 0.94' (1') 3.96' of slots (4') 6-14-89 WED. Set rig @ 12:55 Drilled w/ bentonite olury and a 61/4" bit. Sand / anal / Cabbles At t' started to ciculate "oily" black gel out of the hole. 4"TVC casing was not loved. Back washed benchole and set casing to 8'. Drilled to B1/2; B-B1/2 suttings that couldn't be washed from hole. EPNIG +4 Mourtoning well 21/2 bags of # 10 sand. 1/4 bucket of pellets. Constructed had up a skept any Finished @ 1.55. I Pustective Collor and 2fl² pad. Type 112 portland cement

6-14-80 EPNG # 3 Monitoring Well NED. Set rig @ bentout much. Added sand upto (12) Suntroud to a 5 5/ " 6.1. Thick growt and add to top of bouchole Set protective collar and 2 He pod. pellets and hydrated them. Mixed lepth of 5-6 had to jet I' I sand out of bouhale. Final sand hight at 212. Added bentomite Thisted buckole up clean water to remore 0-2ª Sond / Crarel Cobbles in stand and was encounted at a hindred (a) 5:00 TD=8' 2- H/2 Horack Set bottom of sump at 8' 4/2-8 Sand / Grand rock 3-7 Screen 21/2-3 Sand 11/2-2 Pallets 7-8 Sump 63-14-29 WED EPNG # 24 Monitoring Well Set rig at 3:15 Used a 538" Bot. Rack staining to grany any wast of produced water tank, demainder of the much was reliand on the read. Will have beethol clean it up. Circulated mud out of hole w/ flight water Set sand and pellete. incounted at approx 5 Sand/Grand/lobbles to TD Loference Point for Gul Trunchel 5'. Timoled at 4:00. Set Protection grout. Kunged 2 50% of mud Moved to EPNG 28. Did not get Set top & source at 5 Sand 4/2-9 Seren 5-9 Pellets 212-4/2-Jump 9-10

6-14-89 WED Epila 28 Monitaria Well the annulas Mixed a heavy sentrite mud slurry and august to 20°. Cuthings filled the hole to 17°. Had a difficult time cleaning the hole out. Cobbles left sluffing into Start at 4:15 Completed will up to z to d the Comment medical; will top off the hole in the marning. timated @ 7:00 Serun Sump 16-17 Sand 11\$ 12 Ulto 25 12-16 00 - // 6-15-89 timed at 7:35; started by finishing pad at 28. Blurent monitoring welle up aucomprison Thur EMG1 8.03' 7:50 2a 8.11 26 7.14 6. 2.2 ' 6.97' 9:37 10:15 1:05

6-15-89 Thur Ear took heley and dug had not south rig. The air compressor had a dry Clem in monitoring with by insuling " All have into will and connecting the hove the drill and water from blowing past comprose. 216 1 0.0.0.0.0 Location selected by Dave. Unly Rexcavations and the sample Trench #6 T-6 (South of Trench #) of trench where sample was collected. plastic; gray to do korner; near contact w/ soud and grand the clay is black (appears to be reduced account matter; no kydro carbon abor) collected. Bell hole located sonth TG-E The ourburden was clay: 104 Clay 72 - 63' 56' 36 26 2010 Ter - Torrace Black Staining w/o odor. Janely top soil T-Cat w 9.0. (Fe)w 0-0.0-0 0.0 Load 6-15-89 Thur



6-15-89 thur Dadeground Soil Sample B(= #1 * Samples 2 Samples Sandy "typ soil" " Collected at a dipth of 2 feet Sample from RPZ from oily zone 2-3' trom bentonite zone 3-4' avp. trom massive clay zone 3.3 1 54+1 Frenn from RP1 D EPNG #1 Keserve. Pit Area Started sumping 5-5 at 310 w the word . it finished at 12 the that we ky grade the read and Went to Aster field this and pupared Expuss for Food a pickup. the us, repacked the sample, filled out the chain of austroly, and 6-15-89 Thur

¥ 6-15-89 * OCD wied measurements from well (stee) 200 V= Tr2h 2"well 5X-1 () _ 4-5 5:3 5:2 5 The rasing. CPN4 Mell # = 2 . 2 . 2 28 2" 2A 2" 5 4 W 4 12 ω 1 ft = 7.48 gol 0.2182 ft = * 7.48 gol 1 ft = 0.16319 gol, /ft 5 E, 2 25 2: 0, 12 ٦ N 2 0.2182 ft2 5.42 7.19 DTW 6.30 0 0 0 8.47 7.03 4.84 6.28 4.87 6.50 THE PARTY OF 7.10 3:34 3:55 5:49 5:52 4:00 TIME 3:22 3:28 5:32 3:25 3:44 × 3.46 3:40 t 23.58 20.29 8.18 10.96 6.38 6.81 10.12 11.57 12.47 19.58 13.19 7.60 H 11 0.2182f13 Column 5.04 3.52 14.87 2.38 5.16 19.2 1.03 2.18 4.50 12.89 5.19 76= 18.31 3.27 2-3-28 Jallons 0.401.2 0.77 2.3 2.19 0.88 24 0.37 1.1 0.8626 or 88.0 0.180.54 0.601.8 582 182 6.51 The 2 min 5 ζı Į + :00 1 6 ھـ 5 5 Ø to = 13.44 Kecovery Test" 20 sec 9 54 10 sec 10.40 40 sec 240 100 00 % 30 Sec 60 50 420 480 540 120 110 8 after 45 min of punping 8.76 8.35 8.15 8.03 7.937.847.847.637.647.587.586 -15-8A

	1 2 3 7	144
	Sigh	360
	5.97	300
	6.00	240
	6.06	5 min 180 (
	6.16	2 min 120 6
	6.18	
	6.21	
	6.25	
	6.28	9 08
	6.34	70
	6.41	Inin 60 6
	6.54	50 6
	6.75	1 04
	7.14	30 7
	, 600	20 7
	9 min 540	
	10.22 Bin 480 5.90	to = 10
	st of SI	Ceconom test of
	water was flowing clean.	water was
	notacity waver was alway fines mine	moders u
	Lunch = 10.12 - 10.10 - 10.21	L. J. T.
Left the sate at 6.30.	Initial DTW = 5.42, (5:25) (5:20)	Initial I
Appaning The		
[w/ Ely the	0	w/Tra
	Purna 51@ 4:30	Started Purnoins
6-15-29 Thur		6-15-89

6-16-89 Assimal at the field office at 7:00. Prepared the GW sample containers and filled ice pilleur. Arrived at the Tall up the about Justice work son came to an agrument and mude the messery assangement, will have work material prought in 2 cast to 200-Calibrated pH muter wy standards. Calibrated w/ 720 m + 3000 m. 1# 7 7# d. area 6-16-89 FRL. S-5:5 FANQacd 2 -28 -2A 6.89 5.16 4.81 \$3.93 5,23 6.46 6.19 <u>573839</u> 7.% D-T-W Time 7.10 6.93 8:36 8:46 8:00 9:37 0:53 9:15 9:24 9:34 9:05 9:00 9:50 9:42 9:53

6 min 560 5.94	180		20 1.80 10mm 600 5.86 40 16.75 50 6.54	3 test of 51 = 10.22 = 8min 480 8.60 9min 540	6-15-89 Started Pumping SI@ 4:30 W/ Trash pump. Rumping rate ragen W/ Trash pump. Rumping rate ragen Initial DTW = 5.42' (5:50) Rumping Level = 10.12' - 10.18' - 10.21 Tritially water was pranaf; rust stain; Noadors user noted. Whin 5 min water was flowing clean.	
					Talked w/ Ely the land even about sepaining the read. Left the site at 6:50.	

material procession 2 cost & W.	of made	Talk uf Eli about fixing read again			Calibrated w/	Calibrated pt meter w/ #4 \$ #7		1	site at 8:00 and pumped 5-1.	and filled ice pilleur. Amured at the	7:00. Prepared the Gul sample containers	Anived at the field office at	6-16-8 Fri Fri
SKJO JK-1	55	5-1	۰ 4	()	~ 2	0CD - 1	-4	2	-2B	2A	FING-1		65
<u>3.16</u> 4.81	6.89	5.23	\$3.93	6.46	6.79	6:28	6.19	6.93	7.10	7.96	523833	D-T-W	:
9:53 9:53	9:37 7.5:0	8:00	9:15	9:50	9:34	9:24	9:05	9:00	8:53	1		Time	

6-16-29 Trac EPNG-4 ÉPNG-1 Ł Purged and additional Falling plicht oil ohen. - Last anount junger Punged 25 gallons Temp= 18.4; 16.3; 160; 15.8 I go pump removed at total rented an aucompression to sur Moud to EPN/a-4 Started metion. Took pump out and Temp= 16.8°c 16.3 16.1 with piece of aluminum of conduct. pH= 7.45 7.45 7.48 FC= 1600 lost bailer in well. Petreurs 7H = 7.10; Meter out (Robe) who wyeth clien. No adje bailing and then tried trash Collected samples w/ bailer EC = 1800; 1600; 1800; 1700 pump that could not maintain Water was turbid of the gallone, First 50-40 12:00 1680 2100 7.45 2000 EPNG-3 5 OCD-S Puimped for I have yesterday and I ken today. Sample exterted is bailer. There was a protension on the inside of the well before the water. pH=7.40; 7.45 7.44 7.46; 7.41, EC=1800; 1800; 1800; 1900; 1 4:40 hat 175 5:30 back "forth & purip. Removed total of 80 sallone. Relating clean with slight emonty I working with saco. Had to Ariled 10 Jallone. Black muddy of sederant, Shight Hy Son oher from up w/ sud S vegetall natte manuely two or off autic Took no measurents. No Sprydes: Stained light grey relor Legenning. Natur warn't turked but ~ 1" black sediment bottom of buchist lecaying in water baller played 5100 6-16-89 Fri

6-16-87 7/2. 5-1 (contind pH=7.54; 7.5-1; 7.58 Wells sampled: ENG-1, 4,3 baced all samples on see to they use collected. Filtered all metal samples appropriated preservations. 4/0.45 micron filter piger. alex Just wite a 7:10 no adors were notes Temp= 148; 14.8; 14.7 EC = 860 ; 860; 850 pH= 7.75; 7.73; 7.74 Water from well smelled septie Collected sample with bailer The course of the last two days Rumped for 3 hours during TEM/= 16.1; 15.7.14.5 6:00 PM 6:30 PM EC= 900; 900; 900 51,55 Erna - (* Arrived at the site @ 720. Decensed the pump and sutup the lab Iccopump. The sample callected prinders Begon by re-develoing Erna-1 w/ the was tubid. So we decided to re do A = B = 180; 100; A = 150; 100; 15.1; 15.1;EANG-1 Worked on pH probe and got the prollen. 8:00an Trisel mett mutu to obabilize w/ #7 stanland 25 yestenday = 50 total calling The first SI sample was discarded Removed at total of 25 gal this morning: It pt meter probe winny is 6-17-89 Bat

6-17-89 ERVG 28 what we were doing. He chuk Mananas what we were doing. He chief aded what we were upto. I told him we Purge 45 gallons us Isco pump and then collected samples . Initially mater was much but claud after 15gallons. No black enteration. pH= 7.55 7.54 7.52 7.44 finished at 9:30 Temp: 14.2 15.0 13.9 14.2 9:00 Ed (Manana) Stopped by and No oders on oil were noted EC = 1400 1600 1500 1600 EPNIA 2A KMBA-1 (Duplicate from EPNG 2A) Funced & gallons. Collected immediatly Pringed to gallons w/ Tree pump pint tecollecting samples. Tritally water was slighty minder and turbid Slight gray tint w/ very faint hydro carbon odow. PH = 1.52 7.55 7.55 EC = 1610 1630 1650 Tomp= 16.8 169 1630 Finished 11:15 Finished @ 10:30 6-17-89

6-17-89 000-2 RDthe water was very rusty. This was also also of gravland sound in the well. Anto, live anto where in the well. Vary agring film on some letune mad Culled TML in forming ton and assumed to have samples dropped off furkid this afternoon (Signed custedy over. to Cick . O. 4:30). ph: Bailed well, removed 15 gallow . Initial lemy = Ë, nown into the well. Water was turbid Finaled @ 1:30 to Atmple but No oders noted . Water remained 7.41 1220 17.3 Kemould 15 gallous 7.41 15.8 222 1220 16.0 7.44 Could Tur ULD-3 0CD-4 contaminated w/ sil in the past, and since the well is clearly outside of the plume, no sample's were Since all of the OCD wells were that ball in well; the stal casing but the line used the photing tool to when it. Sailed 5 more gallono. The casing on the well was bent and the bailer would & not enter to the bottom of the well. TEMP = 14. 5 16. 1 16.0 2.45 Junish time. pH = 7.50 EC= 1300 دیا 8 248 1300 7.52 1300 6-17-89 et of

1 ſ f 6-17-89 All samples for shipnent and put new ice, in all of the ice chists. Filled out the down of - custofy and loaded the coolers in the non. Cleand We placed a trip blant in each ice cheat up the New and repuked all of the equipment. Told Mrs. Valequer we were finished with our work and left. Finished at the site @ 4:00. Prepared -4 (Resampled) - 1+ (EANGER) Duplicate = KNBAI Ø (PIneter) Blank = KNBAZ Ø Lister Well's Sampled OCD-EPNG-1 S-5 70 gol/min x 60 min = 4200 x2 = 8,400 82. -2A 12,600 Itos 6-16 8,400 Not Sampled 25 Truce Vol (gal)tate 0 2 not 720+ \hat{w} 25 5 Dampled Dampled 6-30 6-1/ 6:30 pm 6-17 6-17 6-16 6-17 6-16 6-17 6-17 6-16 6-17 4200 1 3 12,600 Sample Time 4:40 pm 12:00 pm 5:30 pr 9:30 m 10 Se ~ 8:00 an 111/5 5.55 pm 4:00 pr 1:30 m

P.60 Skining Son oil released during removal 0.5/80 = 0.0063 $v = \frac{KL}{0} = \frac{JL}{0}$ 0.5/60 = 0,0083 Well sub 0, 5/40 = 0,0125 1/140 = 0.0071= [14,000gal 573, Qay St 7,489 2051] 93.6 St /decry Avg = 0,0072 $\frac{0.0072}{0.25} = 2.7500$ w/0=0.2: v=3.45% Janiph Stremored P. 61 - Restate + ofort to be removed P. 61 - How togather sample since got Pb2 - Low togather sample since got Pb2 - Low togather of down-ynad wells PG3 - Acetone Sampling in 57 PG3 - Monistoring well removal? - ATtime of 046 web Aband? PF4 - Time Site dule

/ Work notest Conclusions (Remediation) Soil 4.3 µg/g Vinnyl Chloride [PVC well matrices degassing ? GUI VOA Groundupater Flow Direction probably varies according to 3 things: 1. seasonal fluctuation of river 2. Pamping rates of relight capacity well field. 3 Divergence due to variations of permeability Ge. buried channel at L to less permeable subserface At - at the plume somewhat ablique to go flow direction at time of measurement (June 89) -low (below NMWQCC stanards) HC values including VOA, PNA, Halogenated, Glorenoted constituants Not 2 - flushing activity of river a (That it is a alove this area)

since HC (no longer?) above NMWBCC standards but a source exists that still impacts gw., source is to be removed . EPNG expresses willingness to remove HC stained soil from dehybratos put and residue in reserve pit. [Does this include plume of vuble Staining?] yes * To determine area to be greavated ? In results of site investigation - does that mean area defineated on Eapproximate limit of HC staining on platts] ? 2. Visual evidence - to extend beyond delineated steering area 3. hab results levels of cont that go will be removed? a. on-sete portable GC. to quantify contam. 4. What about Oil and Grease sleep adjacent to S-6 Clean Up. 1. Uncontaminated overborden stockpiled The ke replaced into accavation when program complete ?? - replacement fill & creation of lateral barrier & to affects i use sa & gravel for fill at water 2. Contaminated Soil Daspositions Expand, a a. stockpiled on site & tested on site before removal What levels deterministics to designated treatment/disposal site -periods of time , containment ,

b. contaminated soil placed directly into trucks for delivery of water to treatment/disposal site C. location of treatment / disposal site will be selected and approved of by OCD before xeavation Excavation - soil exhibiting visual evidence of contain to be completely stripped a [difficult to determine - Samples taken at botton of sepcavation to determine continued execution [portable GC To Comply? " "What WQCC standards for soil", EP Toph tests or derect correlation to water standard analytical Parameters during Kawation for soils 3020 1. BTEX NO 346 Protocol 2. Total HE Petroleum Hydrocarbons (TPH) 3. #H FEC GW Sampling Freq. 1. all MW & S-1 & S-5 Before Kourdion ~ 2. Replacement MW & 51, 55 in MW & after K = R = 1 In plume of # 3. Quarterly sampling - if for 2 consec quarters fullat provider) renain below WOCC - # sampling will discontinue

* No groundwater treatment Chromum at very high levels (161 mg/l stand 05 mg/le) of reserve put site T-IWest Flavorathene .165 mg/Ka TPA ppm (Standard ?" T-2 East Naptholene + acapaptione above standard & .03 ppm 3.9 ppm 3.584ppm (standard ?) North Ford Flowranthene . 178 Chypene -118 Internated Detection limits above water standarde & low mecovery (30-47%) 1. Strip ; stockpile overbarden during season Jammers & Jon June work prevent undere to the product promovers. Undere to the product promovers. One we take provous He brown whether on the product of allowers. Port on followers. of year when water table normaly at its lowest (wintes?) 2. Exercise so stained soil - (including additional debth to ensure total removal of 3. Skim floating product & skimmers or absorbants 4. Monito, clean up as suggested by KW Brown 5. Continued quarterly montoring (Vingl Monde) BG-1 Dichloropropane - 61 Pin Kylene T5 High recovery rates for Hologuated HC "BTEX (89-94%) (18-162%) T3 C Chlorobengene . 19 Check T-1 East .98 pigla Toluene uglg T-1 C P-N Toluene 1.2 pmxylere 15.6 0x 2.2 p.m. 173 mg/g P-S Chlorobenjene . 37 pmX.76 T-IW Bannone. 22 Toluene. 35 P-E p. M.X 1.6 of .5 77 could be 1.52 T-2E Toluene . 26 parylese 94 P-W B2.6T34.3 pm X152 6X 25.2 T-2C RPI-B Chloroethane 4.3

Wates 5_____ z4 ug/l_ EPNG-1- pmX.34 EPNG ZA_ B 8.1 µg/l Echylbengene 37.4 pmX 162 aX 30.4 EPNG ZB B 1.6 E " 1.2 " 10.8 " 1.3 EPNG 3 B.4 T 33 E" 4,3 " 13.1 " .44 EPNG 4___73.95 _____B_.26 T.32 S-5 KWBA-1____B 4.9 OX 15.7 71 ا بې دې د مېروند ور سرمېمې د د. د مېرو د مېرو د مېرو مېرو کې

Summary

* Comments

*

EPNG has expressed willing ness to excavate 4C stained soil from delightstor pit, plane of soils stained by migrating HC's which have been appropriately delineated, and recidere in reserve pit. Three criteria established to determine excavated soils 1. Site investigation - area delineated as "approximate limit of HC staining and approximate locations of dehydrator pet & recerve pit. 2. Visual evidence -3. hab Results (partable GC)

No action regarding ground water is stated since wat standards not exceeded.

Monitoring of clean up will be via samples at bottom of xeavation pit, and grown MW before X cavation begins. Constituents measured will be BTEX, TPH & pHIEC. Analytical protocol will be consistent w/ 5W-846.

After Kcavation completed, water samples from remaining MW's, replacement MW's and S-1 and S-5 will be sampled Eventerly until constituent concentrations remain below WOCC standards for 2 consecutive quarters.

Eccuration procedure to include Stripping and stockpiling overburden? stripping, stockpiling on site and removing contaminated soil .

Execution of contaminated soils will be determined usually and three sampling & analysing the batton of excountion. Sorts Contaminated soils will be stockpilled on sate for additional analysis & then removed to site selected site approved by CCD.

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addition Criteria for contaminated soil clean up 1. State more clearly protocal for analyzing soils and standards deried necessary so as to not impact groundwater quality & NACC standards not adequate. 2. Visual suidence may be difficult during excavation due heavy equipment operations. Visibility also restricted below water table. a. Operations could begin during season of year when water table normally at its lowert? b. additional debth below stained area for 3. Provide for shemming / removal of megrant product M (free floating HC) in expanation. 4. Espand on disposition of contaminated soil , ie. a what & analytical levels fatern determine removal, 5. time frame for pitexcavation to be left open and also include safety plan <> contaminated soil stockpiled on site/Safety precentions it. beneing, security (while excavation open after working has) C. containment of stupped contracted inde 5. Cretirea for selection of Mh replacement? le. Pumping of 5-6 not ad after excavation not addressed. 7. Oil and Grease "slug" adjacent to SX-Z 2, 5-6, and 4.1 mg/l OFG in OCD 2 mghest sevel not addressed area at T-6E not addressed. 8. Platt with surveyed elevations & groundwates levels 9. Volumetric estimates of stripped overburden & stripped contaminated Soul

10. Eccabation procedures -

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Mile Morris Env. averant 6 / WORK NOTES/ Dames Describe voitine well sate management (Section 2.0 ?) 5-1 originally impacted 2/83 (See 3-2, 5-7 , 5-6 only producing (active wells) Vapor line from still column, glycal storage vent line, and the liquid phase damp line souted to unlined pit gas well duelled 1/80 / FVWUA began operating 1981 83" EPNG recorded vapor line & liquid phase dreng line 9/85 OCD developed wells (possibly contaminations wells) compare to lates analysis & composites. 85 OCD report indicates no verifeable cost in MW or unwed production wells - what reported contam? 10/86 OCD reported HC contan adjacent to SI 3/87 Marten Ass conducted investigation (inconclusive) but see info on boring at S-4 for possible background info 8/87 Blair - intested trenching exercise, 6 of 13 trenches contained HC slaming of soil. controdicto p12 Previous work efforts had delineated impacted areas & source Table 2-2 (original) Brewers water quality (after complanate made) Check depths/deamsters of wells to determine purge volumes. 5-5 had septic odos 51-35 VOA'S EPNG 24 \$ 3 Highest BTEX Values NIMWACC Background well (EPNG 1) . 34 peg/l p. m- Kylene (2) No VOA detected downgrodient from 7-3 [T-4 had . 95 peg/l Benjene] 5-5 had trace BT. X Additional upo about referred slug of OfG at 5th (Concert)

CDS LABORATORIES

A DIVISION OF CASA DEL SOL, INC. 75 SUTTLE STREET POST OFFICE BOX 2605 DURANGO, COLORADO 81302

(303) 247-4220

JESUS

WATER SAMPLES SUBMITTED 12/28/89

CDS #	El Paso ID	TIME	Sample Name
1952	F89506	1230 HOURS	FV-6
1953	F59505	1300	FV-5
1954	F89504	1200	FV-2
1955	F89503	1500	FV-6
1956	F89502	1500	FV-5
1957	F89501	1500	FV-2

SOIL SAMPLES SUBMITTED 12/28/89

1958	A 8 9 2 5 3	0743	East side UST-2
1959	A 8 9 2 5 4	0756	West side UST-2
1960	A89255		North end UST-2
1961	À 8 9 2 5 6	··· ··· ··· ···	South end UST-2

AET Project No.: 8193

Parameter	λnalytical Result ppm	Date	Time	Analyst	Nethod Humber
** Client ID: 1958 12/19 Benzene Ethyl Benzene Toluene Xylenes, T. TPH	<0.050 0.050 0.196 0.992 <10.0	12/31/89 12/31/89 12/31/89 12/31/89 01/05/90	6:30pm 6:30pm 6:30pm	CMB CHB CHB	8240 8240 8240 8240 8240 503D/E
** Client ID: 1959 12/19 Benzene Ethyl Benzene Toluene Xylenes, T. TFH	<0.050 0.152 0.889 4.43 <10.0	12/31/89 12/31/89 12/31/89 12/31/89 01/05/90	6:30pm 6:30pm 6:30pm	СИВ СИВ СИВ	8240 8240 8240 8240 503D/E
** Client ID: 1960 12/19 Benzene Ethyl Benzene Toluene Xylenes, T. TPH	<0.050 0.088 0.412 1.986 <10.0	12/31/89 12/31/89 12/31/89 12/31/89 01/05/90	6:30pm 6:30pm 6:30pm	СМВ СМВ СМВ	8240 8240 8240 8240 8240 503D/E
** Client ID: 1961 12/19 Benzene Ethyl Benzene Toluene Xylencs, T. TPH	<0.050 0.109 0.483 2.31 <10.0	12/31/89 12/31/89 12/31/89 12/31/89 01/05/90	6:30pm 6:30pm 6:30pm	CMB CMB CMB	8240 8240 8240 8240 8240 503D/E

All of the above tests were performed as outlined in the U.S. E.P.A. "Methods for Chemical Analysis of Water and Wastes," 1983, "Standard Methods for the Examination of Water and Wastewater," 1985, and U.S. E.P.A. "Test Methods for the Evaluation of Solid Waste--SW846," 1986. Other methods as approved by the client are utilized. See specific method reference.

Certification:

H. Nathan Levy III

President

、		ENVIRONMENTAL	SAMPLING DATA 5193	17	1958	
	Facility No.	SOLL -		2		Hr. Cik.
	Sample Logation 61	NEOLAL SCAEL	ON Na Metro		-	
	Sample Location	FAST SIDE LIC	T - 2	Z Charge	·····	<u></u>
	Sampling Site Description		· ·	.L.r	· ·····	
	Date of Collection (MMDDYY) Sample Collected By22 Laboratory Conducting Analys		Collection Metho	d ∕4 Gr	ab 🗌 Comp	hrs.
	Sample Collected By	AVE INALL		Phone D	05-831-77	59
	Laboratory Conducting Analys	is <u>CDS 1.165</u>	DERNGO			,
			, check oppropriate blocks)			
	GROUP A	Hardness	Residue, Nonfilterable		GROUP T	
	Ammonia	Iron	Residue, Settleable	Benzer	18	
	Chemical Oxygen Demand	Lead	Residue, Volatile	Benzo-	-a-pyrene	
	Kjeldahl Nitrogen	Magnesium	Silico	Bromo	form	
	Nitrate	Manganese	Sulfate	Bromo	dichloromethane	
	Nitrite	Mercury	Sulfite	Carbor	n Tetrachloride	
	Oil & Grease	Molybdenum	Surfactants-MBAS	Chloro	form	
	Organic Carbon	Nickel		Chloro	methane	
[Orthophosphate	Potassium	GROUP H	Dibron	ochloromethane	
	Phosphorus, Total	Selenium	BHC Isomers	1,1-01	chloroethene (D	CE)
		Silver	Chlordane	1,2-Di	chloroethane (E	DC)
	GROUP D	Sodium	DDT Isomers	1,1-Di	chloroethylene (1,1-DCE
	Cyanide, Total	Thollium	Dioldrin	Ethylbe		
		Zinc	Endrin		ie Dibromide	
- (GROUP E	000000	Hoptochlor		ene Chloride	
	Phenois	GROUP G Acidity, Total	Heptachlor Epoxide		ethylnapthalenes)
ł	GROUP F	Alkalinity, Total	Methoxychlor	PAH	ialene, Total	
ł	Aluminum	Alkalinity, Bicarbonate	Toxaphene	PCBs		
ł	Arsenic	Bromide	2,4-0		Tetrachioroethar	PCE)
	Barium	Carbon Dioxide	2,4,5-TP		Trichloroethane	
ł	Beryllium	Chloride	2.4.5-T		Trichloroethane	
ł	Boron	Color			Trichloroethylene	(TCE)
ł	Cadmium	Fluoride	GROUT !		methane	<u> </u>
ł	Calcium	Iodide	Sulfides	TOX		
ł	Chromium, Total	Odor		Toluen	9	
t	Cobait	Residue, Total	Asbestos	Vinyl C	Chloride	
Ì	Copper	Residue, Filterable(TDS)	Ignitability	Xylene	s, Total	
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283	DR JOE A POWERT	1710 Angeboard Drive			-	temhoe/c
SP2983	(Company)	Baron Rouge, La. 70303	(Company)		EC	
		Phone: (50.4) 769-1930				
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	ENVIRONMENTAL	SAMPLING DATA 8193	8	1954	
Facility No.	ample Matrix <u>Sr214</u> Sa	mple No. 282256	L Time	075624	Hr. Cik.
Sample Location	UCOLN SCACI	on va artic	C Charg	đ	
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Date of Collection (MMDDYY) Sample Collected By Laboratory Conducting Analys	7377989	Collection Metho	a de la	ab 🗍 Comp	hra
Sample Collected By 221	WE WALL		Phone 5	05-821-97	59
Laboratory Conducting Anglys	· CDS Labs	DECANGO			~
	ANALYSIS REQUESTED (check appropriate blocks)			
GROUP A	Hardness	Residue, Nonfilterable		GROUP T	
Ammonia	Iron	Residue, Settleable	Benzei	······	
Chemical Oxygen Demand	Load	Residue, Volatile	Benzo	-a-pyrene	<u> </u>
Kjeldahl Nitrogen	Magnøsium	Silica	Bromo	form	
Nitrote	Manganese	Sulfate	Broino	dichloromethane	
Nitrite	Mercury	Sullite	Carbor	i Tetrachloride	
Oil & Grease	Molybdenum	Surfactants-MBAS	Chloro	form	
Organic Carbon	Nickel		Chloro	methane	
Orthophosphate	Potassium	GROUP H		nochloromethane	
Phosphorus, Totai	Selenium	BHC Isomers		ichloroethene (D	
020110	Silver	Chlordane		ichloroethane (E	
GROUP D	Sodium	DDT Isomers		ichlorosthylene ((1,1-DCE
Cyanide, Total	Zinc	Endrin	Ethylb		
GROUP E		Heptachlor		ne Dibromide ene Chloride	<u></u>
Phenois	GROUP G	Heptachlor Epoxide		ethylnopthalener	
	Acidity, Total	Lindane		alene, Total	
GROUP F	Alkalinity, Total	Methoxychlor	PAH		<u> </u>
Aluminum	Alkalinity, Bicarbonate	Toxaphene	PCBs		
Arsenic	Bromide	2,4-D	1,1,2,2	Tetrachloroetha	ne(PCE)
Barium	Carbon Dioxide	2,4,5-TP-Silvex		Trichloroethane	
Beryllium	Chloride	2,4,5-T	1,1,2	Trichloroethane	
Boron	Color		1,1,2	Trichloroethylene	(TCE)
Cadmium	Fluoride	GROUP J	Trihale	omethanes	
Calcium	lodide	Sulfides	τοχ		
Chromium, Total	Odor		Toluen		
Cobalt	Residue, Total	Asbestos		Chloride	
Copper	Residue, Filterable(TDS)	Ignitability	Xylana	s, Tolal	
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(Company)	Baron Kouge, La. 70809	(Company)		EC	,
L	Phone: (504) 769-1930	<u>, , , , , , , , , , , , , , , , , , , </u>			

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	EL PASC ENVIRONN	ENTAL GAS	LING DATA	8193	194	\hat{n}
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	L_ Somple Matrix	Sample N			ـــالـــالـــا 24	Hr. Cik.
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Date of Collection (MM	100YY) [2][2][2][2][2][2]	-	Collection M	othod I Gre		hrs.
Sample Collected By	DAVE WALL			Phone 50	15-831-97	59
Laboratory Conducting	IDDYY) ZZZZZ DALE IVALL Analysis <u>CDS L.</u>	65 D	CANGO			
	ANALYSIS REQUEST	ED (check o	ppropriate blog	(x, x)		
GROUP A	Hardness		due, Nonfilterab		GROUP T	
Ammonia	Iron		due. Settleable	Benzen		
Chemical Oxygen De	mand Load	Resi	due, Volatile		-a-pyrene	
Kjeldahl Nitrogen	Magnesium	Silic		Bromot		
Hitrate	Manganese	Sulfo	ote	·····	dichloromethane	
Nitrite	Mercury	Sulfi	te	Carbon	Tetrachloride	
Oil & Grease	Molybdenum	Surf	actants-MBAS	Chlorof		
Organic Carbon	Nickel		·····	Chloror	nethane	
Orthophosphate	Potossium		GROUP H		ochloromethane	
Phosphorus, Total	Selenium	BHG	nomers		chloroethene (D	
	Silver	Chlo	נודי יוס		chloroethane (El	
GROUP D	Sodium	TOO	lsomers	1,1-Di	chloroethylene (1,1-DCE
Cyanide, Total	Thallium	Dielo	irin	Ethylbe		
	Zinc	Endr	in	Ethylen	e Dibromide	
GROUP E		Hept	achlor	Methyle	me Chloride	
Phenols	GROUP G	Hept	achlor Epoxide	Monom	ethylnoptholenes)
	Acidity, Totat	Linde	ane	Naphth	alene, Total	
GROUP F	Alkalinity, Total	Meth	oxychlor	PAH		
Aluminum	Alkalinity, Bicarbond	ite Toxa	phene	PCBs		
Arsenic	Bromid a	2.4-	D	1,1,2,2	Tetrachloroethar	e(PCE)
Barium	Carbon Dioxide		5-TP-Silvex	1,1,1-	Trichloroethane	
Beryllium	Chloride	.5	5-T	1,1,2 1	richloroethane	
Boron	lor			1,1,2 1	richloroethylene	(TCE)
Codmium	oride		GROUP J		methanes	
Calcium	Iodide		des	τοχ		
Chromium, Total	Odor			Toluene		
Cobalt	Residue, Total	Asbe	·····	Vinyl C		
Copper	Residue, Filterable (TDS) [] Ignit	ability	Xylenee	n, Total	
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Sample Collected By			Phone 303-0 37-1154
Laboratory Conducting Analys			
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GROUP A	Hardness	Residue, Nonfilterable	GROUP T
Ammonia	Iron	Residue, Settleable	Benzene
Chemical Oxygen Demand	Lead	Residue, Volatile	Benzo-a-pyrene
Kjeldahl Nitrogen	Magnesium	Silica	Bromoform
Nitrate	Manganese	Sulfate	Bromodichloromethane
Nitrite	Mercury	Sulfite	Carbon Tetrachloride
Oil & Grease	Molybdenum	Surfactants-MBAS	Chloroform
Organic Carbon	Nickel		Chloromethane
Orthophosphate	Potassium	GROUP H	Dibromochloromethane
Phosphorus, Total	Selenium	BHC Isomers	1,1-Dichloroethene (DCE)
	Silver	Chlordane	1,2-Dichtoroethane (EDC)
GROUP D	Sodium	DDT Isomers	1,1-Dichloroethylene (1,1-DC
Cyanide, Total	Thallium	Dieldrin	Ethylbenzene
	Zinc	Endrin	Ethylene Dibromide
GROUP E		Heptachlor	Methylene Chforide
Phenois	GROUP G	Heptachlor Epoxide	Monomethylnapthalenea
	Acidity, Total	Lindane	Naphthalene, Tatal
GROUP F	Alkalinity, Total	Methoxychlor	РАН
Aluminum	Alkalinity, Bicarbonate	Toxaphene	PCBs
Araenic	Bromide	2.4-D	1,1,2,21etrachloroethane(PCE)
Barium	Carbon Dioxid a	2,4,5-TP-Silvex	1,1,1-Trichloroethane
Beryllium	Chloride	2.4.5-T	1,1,2 Trichloroethane
Boron	Color		1,1,2 Trichloroethylene (TCE)
Cadmium	Fluoride	GROUP J	Trihalomethanes
Calcium	lodide	Sulfidea	TOX
Chromium, Total	Odor		Toluene
Cobalt	Residue, Total	Asbestos	Vinyl Chloride
Copper	Residue, Filterable(TDS)	Ignitability	Xylenes, Total
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AND BTEX.	TIONS SEAD RESUL	TS AND INCOLCE	To Julin hundedin
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K.W. BROWN & ASSOCIATES, INC.

Page:1 of 2

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Page: 2 of 2

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F.O. # - 25603

K.W. BROWN & ASSOCIATES, INC.

Project: EPN6 FLORA VISTA - 63712

Page: 2 of 2

7/18/89

89053 EPN6 - 2A 89054 EPN6 - 28 89055 EPN6 - 3 5 - 5 07068 1 - 5 65068 89057 OCD - 1 89058 OCD - 2 89056 EPN6 - 4 89061 KNBA - 1 400 S-S DUP 39056 EPN6 4 DUP 39052 EPN6 - 1 Lab # Location Magnesium Potassium ng/1 0.32221234558853 6.3312214558853 1/ Ď1 1.8 1.8 1.8 1.8 1.9 1.9 1.8 1.8 ю Sodiua ∎g/1 Cation 25.46 23.30 21.44 28.10 25.72 25.48 16.83 17.80 10.69 10.55 23.12 11.18 Sua 25.80 23.26 21.84 28.29 28.29 25.41 25.12 16.43 17.70 11.00 10.41 10.43 23.07 Anion Difference Sum 0.09 0.11 1.33 0.57 1.20 0.28 0.81 0.71 0.50 0.34 0.09 0.66 ~ Barium @g/1 0.5 0.5 0.5 0. . 0.5 0.5 0.5 Cadmium 0.009 0.009 0.0100.010 0.0100.010 0.010 0.010 0.010 nag/} Chromium **n**g/1 0.03 0.02 0.02 0.02 0.02 (0.02)0.03 0.02 0.02 0.02 0.02 0.02 Selenium 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 #q/1

89062 KWBA - 2

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STATE OF NEW MEXICO



ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

GARREY CARRUTHERS GOVERNOR

March 30, 1989

POST OFFICE BOX 2088 STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO 87504 (505) 827-5800

CERTIFIED MAIL RETURN RECEIPT NO. P-918-402-154

Mr. Kenneth E. Beasley, Manager North Region Compliance Engineering EL PASO NATURAL GAS COMPANY P. O. Box 1492 El Paso, Texas 79978

RE: Site Investigation Report/Remedial Action Plan for the Manana-Mary Wheeler #1E Gas Well Site, Flora Vista, New Mexico

Dear Mr. Beasley:

Attached are my comments on the above report. After review by you and your consultant, K.W. Brown and Associates, I would like to schedule a conference call or meeting in mid to late April to discuss my comments, your reply, and a schedule to commence work in late spring/early summer. The goal should be to accomplish physical removal of soils and complete cleanup by the end of the summer.

Two other issues, not mentioned previously in correspondence, but which I believe are critical to future protection of ground water, are the placement of proper well seals and locks on Flora Vista's water wells, and replacement of Manana's produced water tank. The issue of the unused but open, unsealed water wells has been mentioned numerous times, including as recommendations in my 1986 reports. Wells S-1, S-4, and S-5 and any other unused production wells should be sealed but with locking caps so that water level and sampling can be conducted as necessary. Exploratory wells SX-1 and SX-2 should have their caps examined and welded shut, if not already done so.

Secondly, Manana's fiber-glass tank sits partially below grade and has a buckled side. It should be replaced by an above ground metal stock tank, probably at the time of excavation. Without these additional precautions the cleanup could be undone in the event of vandalism or accident and charges could be made that EPNG was negligent in cleanup. OCD will contact Manana regarding the produced water tank, but EPNG may wish to assume responsibility for sealing unused wells to avoid any further future liability.

Along with my comments, I have also enclosed a copy of a map showing the Flora Vista numbering of water wells. Please send a copy of EPNG's December's Flora Vista analyses; I ended up with results of some other EPNG sampling.

Mr. Kenneth E. Beasley March 30, 1990 Page -2-

On a personal note, with the rehiring of Bill Olson, we're finally digging ourselves out of the remedial action hole we were in (Pardon the expression!). We have at least a dozen projects needing attention similar to this one. My apologies for taking so long to get these comments out.

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Sincerely,

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ine

David G. Boyer, Hydrogeologist Environmental Bureau Chief

DGB/sl

Enclosures

cc: W. J. LeMay, Director OCD OCD Aztec Office J. Eichelmann, Burlington Northern S. Johnson, KW Brown & Associates

COMMENTS ON SITE INVESTIGATION/REMEDIAL ACTION PLAN AT MANANA MARY WHEELER #1E GAS WELL FLORA VISTA, NEW MEXICO

Prepared by David G. Boyer, Hydrogeologist March, 1990

I. Comments on Site Investigation Report

1. p.41, Table 3-4. The values for Benzo(b) fluoranthene and Indeno (1, 2, 3-cd) pyrene should be shown as 2 and 6 ug/l (instead of 0.002 and 0.006 ug/l). The correct values for WQCC standards for Ethylbenzene, Toluene and Xylenes (total) are 750, 750 and 620 mg/l, respectively.

2. p.45. A discussion of oil and grease concentrations found in soil samples taken from trenches 6 and 7 is presented. Additional investigation is necessary to verify the actual presence of a "slug" of oil in this area, especially if analytical techniques may have contributed to false positive readings (ref. "A Comparison of Methods of Measuring Total Petroleum Hydrocarbons in Soil," 1989 NWWA/API Proceedings of the Conference on Petroleum Hydrocarbons and Organic Chemicals in Ground Water) present a plan to perform the necessary verification.

3. p. 48. Please provide a copy of the referenced 1983 paper on risk assessment by Crouch ("The Risk of Drinking Water").

4. p.48, Comment on Section 4.0, Risk Assessment. As stated in this section, risk assessment techniques are used to estimate chronic toxic potential from contaminants dissolved in ground water. In addition to dissolved contaminants we have an oil phase that imparts visual and hydrocarbon odor characteristics to the water. The assessment technique would seem more appropriate if used after the cleanup to evaluate the risk of any remaining dissolved constituents.

5. p.52, Table 4.2. The contaminant concentrations listed in Table 4.2 are 1000 times greater than actually observed (eg. Benzene concentration in EPNG-2A is 8.1 ppb not 8,100 ppb). I suspect these are transcription errors. Please verify that the risk calculations shown are for the actual concentrations and not those shown in the table.

6. p. 57. In New Mexico, buried reserve pits commonly contain waste debris from drilling operations. It would not surprise me to find concrete fragments and scrap pipe in the pit.

II. Remedial Action Plan

A. Section 6.1.1. Contaminated Soil

1. p.59. Describe further the procedure for visual inspection verification of removal of contaminated soil, especially since contamination extends to sands and gravels beneath the water table. Is temporary dewatering proposed as part of the soil removal process?

2. p.59. Removal of hydrocarbon stained soil should extend to the vicinity of well S-1 since staining was noted in that location during the 1987 excavation (See the discussion on page 2 of Dr. Blair's 1987 report).

3. p.59. What procedures are proposed to determine the extent and the necessity for soil removal under lease structures (eg. oil/water separator, produced water tank, meter house).

4. p.59. Describe the type and source of the material that will be deposited in the excavation to replace the contaminated soil.

5. p.60. If the contaminated soll is stored on site prior to offsite removal, it must be stored such that oil and water drainage is intercepted prior to discharge to the bare ground. Likewise, saturated soil cannot be loaded directly into trucks such that oily water will discharge onsite or enroute to the disposal location.

B. Section 6.1.2. Contaminated Groundwater

1. p.60. Explain the impacts to the area adjacent to well S-5. Is the reference to the oil and grease analyses or the low levels of dissolved hydrocarbons found during the 1989 site investigation sampling?

2. p.60. Additional sampling of S-5 is necessary to verify if benzene and toluene are present at trace levels as shown in the 1989 site sampling. (1986 sampling also detected these at about the same levels).

3. p.60. During excavation, water will be made turbid with the disturbance and residual oil may be freed from the soil and float on top of the water. Equipment should be available on site during excavation to skim and remove floating oil.

C. Section 6.3. Monitoring Soil

...

1. p.61. Soil. Explain how representative samples are to be collected from the bottom of the excavation if the excavation is not dewatered.

2. p.61. Groundwater. The December, 1989 EID/OCD sampling of well S-1 detected acetone. Pre-cleanup sampling should verify the presence or absence of that contaminant.

3. p.62. In addition to replacement monitor wells, I would like to discuss digging a temporary trench just downgradient of the southwestern-most area of excavation to serve as an observation trench. It would provide visual verification (absence of product or sheens) that no floating hydrocarbons escaped excavation. More importantly, with ground water flow at 2 to 3 feet per day, it would allow natural volitization of any remaining dissolved hydrocarbons. With a minimum of agitation and circulation the trench could act as a final treatment "air stripper" and aeration system. It could be kept in use for a short period of time (90-120 days) after excavation and soil replacement has been completed to allow flushing of the replacement soil. 4. p.62. Suggest a schedule for short and long term pumping and testing of well S-1 after completion of the excavation.

5. p.62. Provide the number and location of the proposed monitoring wells.

6. p.62. Analytical Parameters. In addition to the proposed sampling constituents, analyses of water should include major cations and anions. Soil analyses should include chromium and those PAH's detected and shown in Table 3.5 (p. 43).

7. p.63. Sampling Frequency. Monitor wells shall be removed, or properly plugged and abandoned at the conclusion of their use. This will be no later than at the time of decommissioning of the gas well, or an earlier time as approved by OCD after consultation with other involved parties (i.e. Flora Vista Water Users, EID, EPNG, Manana).

D. Additional Comments

...

Provide a proposed timetable for the start and completion of the remedial action, including the time expected to be required for the excavation phase.



FIGURE 2-1. MAP SHOWING LOCATION OF THE MANA - MARY WHEELER #1-E WELL SITE.

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