N61165.AR.005787
CNC CHARLESTON
5090.3a

FINAL CONTAMINATION ASSESSMENT REPORT FOR THE CHICORA TANK FARM CNC CHARLESTON SC

04/01/1994

KEMRON ENVIRONMENTAL SERVICES, INC

FINAL CONTAMINATION ASSESSMENT REPORT FOR THE CHICORA TANK FARM CHARLESTON NAVAL SHIPYARD CHARLESTON, SOUTH CAROLINA UIC: M60169

* * *

Prepared by:

KEMRON Environmental Services, Inc.
2987 Clairmont Road, Suite 150
Atlanta, Georgia 30345

Contract No. N62467-87-D-0650

Report Team Members

William Murdy, P.G.
James Novitsky, PhD
Andrew Clark, Project Geologist

* * *

Southern Division Naval Facilities Engineering Command

Daryle Fontenot, Engineer in Charge

Prepared for:

Naval Facilities Engineering Command
2155 Eagle Drive
P.O. Box 10068
Charleston, South Carolina 29411

April 1994

DISTRIBUTION LIST

Addresses	Number of Copies
Commanding Officer Attn: Code 1841 Southern Division Naval Facilities Engineering Command 2155 Eagle Drive North Charleston, SC 29418	4
Commander Charleston Naval Shipyard Attn: Ron Dewitt Building 76, Code 106 Charleston Naval Base Charleston, SC 29409-6100	2
Department of Health & Environmental Control Groundwater Protection Division Attn: Mr. Tim Mettlin 2600 Bull Street Columbia, SC 29201	4
Department of Health & Environmental Control Attn: Mr. Wayne Fanning 1000 Air Park Road Charleston Heights, SC 29418	2
Commanding Officer Naval Supply Center (Attn: Code 44) Charleston Naval Base, Bldg. 198 Charleston, SC 29408	2
Commanding Officer Naval Petroleum Office Attn: Code 30 Alexandria, VA 22304-6180	2

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188

1a REPORT SECURITY CLASSIFICATION: Unclassified	1b RESTRICTIVE MARKINGS: N/A
2a SECURITY CLASSIFICATION AUTHORITY: N/A	3 DISTRIBUTION / AVAILABILITY OF REPORT: N/A
2b DECLASSIFICATION / DOWNGRADING SCHEDULE: N/A	
4 PERFORMING ORGANIZATION REPORT NUMBER(S): 6544	5 MONITORING ORGANIZATION REPORT NUMBER(S): N/A
6a NAME OF PERFORMING ORGANIZATION: KEMRON Environmental Services, Inc. / 6b OFFICE SYMBOL (If applicable):	7a NAME OF MONITORING ORGANIZATION: Charleston Naval Shipyard
6c ADDRESS (City, State, and ZIP Code): 2987 Clairmont Rd., Ste. 150 Atlanta, GA 30329	7b ADDRESS (City, State, and ZIP Code): Chicora Tank Farm Charleston, South Carolina
8a NAME OF FUNDING / SPONSORING ORGANIZATION: SOUTHNAVFACENGCOM / 8b OFFICE SYMBOL (If applicable): N/A	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER: N62467-87-D-0650
8c ADDRESS (City, State, and ZIP Code): 2155 Eagle Drive Charleston, SC 29418	10 SOURCE OF FUNDING NUMBERS: PROGRAM ELEMENT NO / PROJECT NO / TASK NO / WORK UNIT ACCESSION NO.

11 TITLE (Include Security Classification)
Contamination Assessment Report for the Chicora Tank Farm
Charleston Naval Shipyard, Charleston, South Carolina

12 PERSONAL AUTHOR(S)
William H. Murdy, III, PG, Andrew H. Clark, PG, James Novitsky, PhD

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Final	FROM _____ TO _____	1994 April 21	525

16 SUPPLEMENTARY NOTATION

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

This document provides a compilation and review of assessment results for the Chicora Tank Farm, Charleston, South Carolina. Based on the assessment, it is apparent that releases of petroleum constituents have had little effect on groundwater quality as measured using BTEX, TPH and PAH analyses. However, detectable levels of heavy-fraction hydrocarbons are present in site groundwaters. Significant levels of petroleum residues in soil appear to be limited to sediment in the spill containment pond.

20 DISTRIBUTION / AVAILABILITY OF ABSTRACT	21 ABSTRACT SECURITY CLASSIFICATION
☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS	N/A
22a NAME OF RESPONSIBLE INDIVIDUAL: Daryle Fontenot	22b TELEPHONE (Include Area Code): (803) 743-0607 / 22c OFFICE SYMBOL: 1841

DD Form 1473, JUN 86 — Previous editions are obsolete. — SECURITY CLASSIFICATION OF THIS PAGE

S/N 0102-LF-014-6603

ACKNOWLEDGEMENTS

The Contamination Assessment Study team thanks the many people at the Chicora Tank Farm, Naval Supply Center Charleston, and the Southern Division Naval Facilities Engineering Command, who cooperated to make successful completion of this study possible. We would also like to gratefully acknowledge the efforts and assistance of the Naval Energy and Environmental Support Activity.

EXECUTIVE SUMMARY

This document summarizes analytical and field data collected during a preliminary contamination assessment, four quarterly groundwater monitoring events, and a sediment sampling and analysis events at the Chicora Tank Farm (CTF), a below ground petroleum tank farm operated by the Naval Supply Center in Charleston, South Carolina.

Assessment activities for the Chicora Tank Farm (CTF) were performed at the request of the Department of the Navy, Southern Division, Naval Facilities Engineering Command (Daryle Fontenot, Engineer in Charge) under contract number N62467-87-D-0650, and according to Statement of Work dated 25 January 1991. The CTF Installation Work Plan for additional assessment activities above and beyond those assessment activities previously conducted for the Preliminary Contamination Report/ Corrective Action Plan included the following activities: 1) the collection and analysis of sediment samples from the spill containment pond; 2) the removal and disposal of free-phase product in manhole FD-3; and 3) the collection and analyses of groundwater samples from the groundwater monitoring wells and the underground drainage system for four consecutive quarters.

Based on this assessment, it is apparent that releases of BTEX, TPH and target PAH constituents from the tanks or pump rooms has had little affect on groundwater quality. However, detectable levels of heavy-fraction hydrocarbons are present in site groundwaters. Significant levels of petroleum residues in soils appear to be limited to sediment in the spill containment pond.

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1. INTRODUCTION

1.1 PURPOSE AND SCOPE. This document summarizes analytical and field data collected during a preliminary contamination assessment, four quarterly groundwater monitoring events, and sediment sampling and analysis events at the Chicora Tank Farm (CTF), a below ground petroleum tank farm operated by the Naval Supply Center in Charleston, South Carolina. The site location is illustrated in Figure 1-1. All data has been reported previously in the following five submittals:

* ***Preliminary Contamination Assessment Report/Contamination Assessment Plan for Chicora Tank Farm, Charleston Naval Shipyard, Charleston, South Carolina (PCAR/CAP)***, dated July 1992,
* ***Installation Work Plan and Results of First Quarterly Monitoring Event for Chicora Tank Farm, Charleston Naval Shipyard, Charleston, South Carolina***, dated May 1993,
* ***Results of Second Quarterly Monitoring Event for Chicora Tank Farm, Charleston Naval Shipyard, Charleston, South Carolina***, dated August 1993,
* ***Results of Third Quarterly Monitoring Event for Chicora Tank Farm, Charleston Naval Shipyard, Charleston, South Carolina***, dated November 1993, and
* ***Results of Fourth Quarterly Monitoring Event for Chicora Tank Farm, Charleston Naval Shipyard, Charleston, South Carolina***, dated February 1994.

This Contamination Assessment Report for the Chicora Tank Farm (CTF) was prepared at the request of the Department of the Navy, Southern Division, Naval Facilities Engineering Command (Daryle Fontenot, Engineer in Charge) under contract number N62467-87-D-0650, and according to Statement of Work dated 25 January 1991. The CTF Installation Work Plan, as presented in the KEMRON's previous reports included the following activities: 1) the collection and analysis of sediment samples from the spill containment pond; 2) the removal and disposal of free-phase product in manhole FD-3; and 3) the collection and analyses of groundwater samples from the groundwater monitoring wells and the underground drainage system for four consecutive quarters.

The purpose of quarterly groundwater monitoring was to develop a database of groundwater quality data. Additional soils data was generated to assess petroleum residues in site soils and spill containment pond sediments.

1.2 REPORT ORGANIZATION. Chapter 2 of this document includes site background data and information on the general area. Chapter 3 includes a discussion of the preliminary contamination assessment at the site, including specifics of soil boring and monitoring well installation and soil gas/ traces surveys. Chapter 4 includes a summary of analytical and field data generated during the quarterly monitoring program for assessment of groundwater, and Chapter 5 includes a summary of analytical and field data generated for assessment of site soils. Conclusions are presented in Chapter 6.

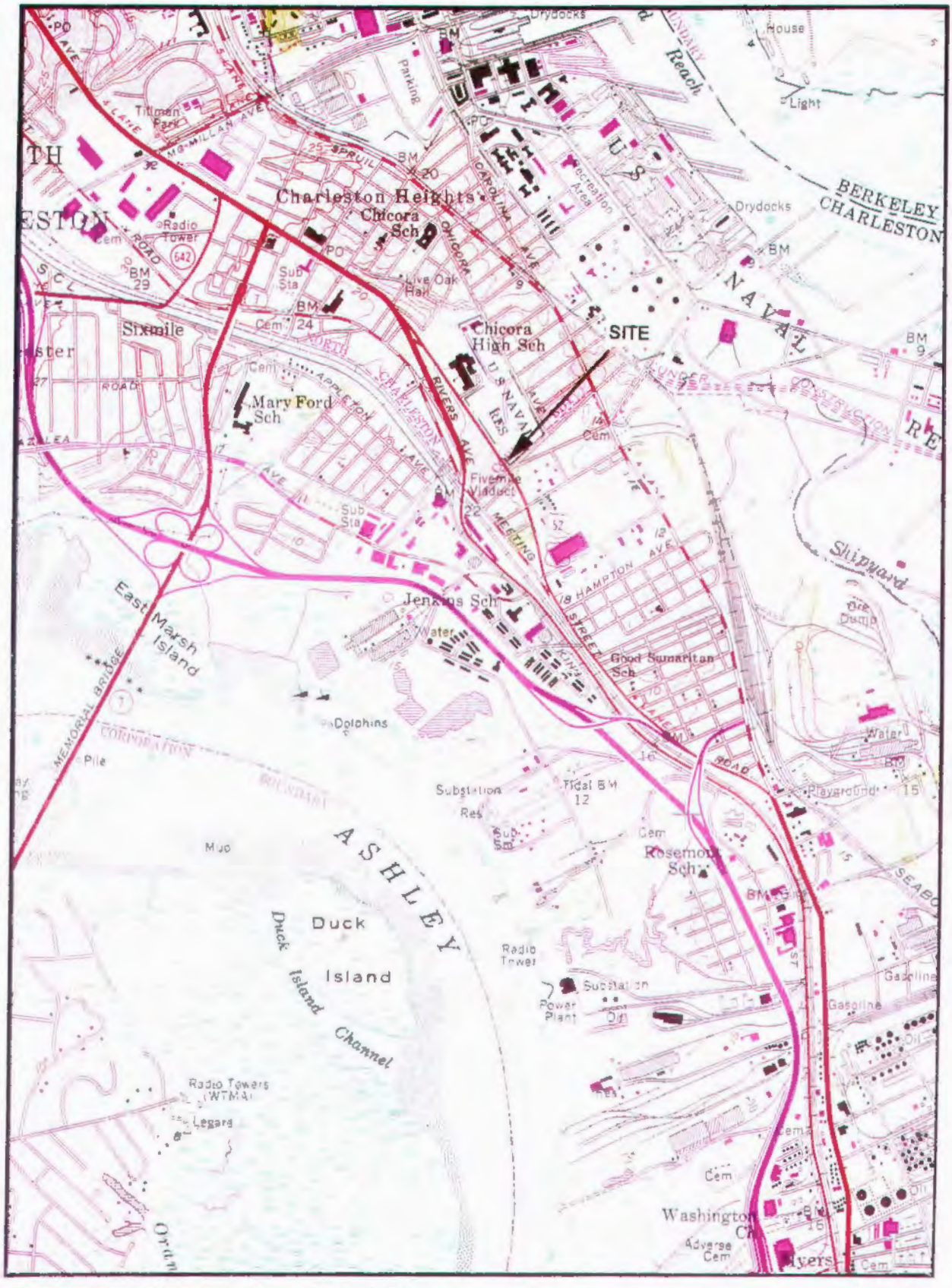


Figure 1-1. Vicinity Map Scale 1:24000
7.5 Minute USGS Charleston, SC Quadrangle.

CHAPTER 2. SITE DESCRIPTION

2.1 STUDY AREA. CTF is a 23-acre site which formerly supplied fuel and lubricants to the Naval Shipyard. CTF is located approximately 500 yards west of the Charleston Naval Shipyard (Figure 1-1). The area surrounding CTF is a mature urban neighborhood with commercial, public, and residential land uses.

Commercial areas are located primarily along the south and southwest sides of the tank farm. Major commercial enterprises include a transmission shop and a trucking facility southwest of the site. A cargo container storage facility is located south of CTF, beyond Clements Ferry Road. The Norman C. Toole Middle School is located west of and adjacent to the site. Residential homes occupy properties east of the site, beyond Chicora Avenue, and north of the site, beyond the drainage slough.

2.1.1. Underground Storage Tank Farm. The tank farm consists of six fuel storage tanks which are covered with soil (3-5 feet thick at the apex), such that each tank appears to be a small hillock. Tanks have working capacities of 50,000 bbl and 27,000 bbl. The locations of these tanks are shown in Figure 2-1. Each tank interior is approximately 25 ft. in height and is constructed with 24 in. reinforced concrete walls and a domed roof. Connected to each tank is a pump room, measuring approximately 23 ft. x 24 ft. x 27 ft. The exterior of each tank is coated with 3 inches of gunite to minimize leakage of groundwater into the tanks.

2.1.2. Subsurface Drainage System and Spill Containment Pond. To control groundwater flow and collect spills within the tank farm area, a subsurface drainage system and containment pond were built. The subsurface drainage system is a network of "french drains" which consist of an underground 18-in. diameter main drainage pipe which underlies the long axis of the site and discharges to the spill containment pond. Connected to this drain are a series of 12-in. diameter drains which extend around or under each tank. As the water table fluctuates, groundwater seeps into the perforated tank drain pipes where it is channeled to the main drainage pipe. Water then flows through this pipe and discharges into the spill containment pond located on the northwest portion of the property.

In addition, a surface drainage ditch located along the northeast boundary of the tank farm collects surface waters and routes these waters to the spill containment pond. All water which enters the pond then bypasses an inoperable oil skimmer system and flows into the marshy tidal slough adjacent to the northern boundary of the site. Both the drainage ditch and the pond are lined with 30-mil polyethylene.

Three manholes, designated as FD-1, FD-2, and FD-3, Figure 2-2, provide access to the underground drain system. The 12 in. diameter pipe drain laterals located beneath tanks M, N, and O connect with the main drainage line at manhole FD-1, the southernmost and upgradient manhole. The 12 in. diameter pipe drain that is located beneath tank P connects with the main drainage line at manhole FD-2, the central manhole. The drain lateral beneath tank K connects at the main drainage line at manhole FD-3, the northernmost manhole. Approximately 40 ft. northwest of FD-2, a lateral beneath tank L connects with the main drainage line; however, no surface access is available at this location.

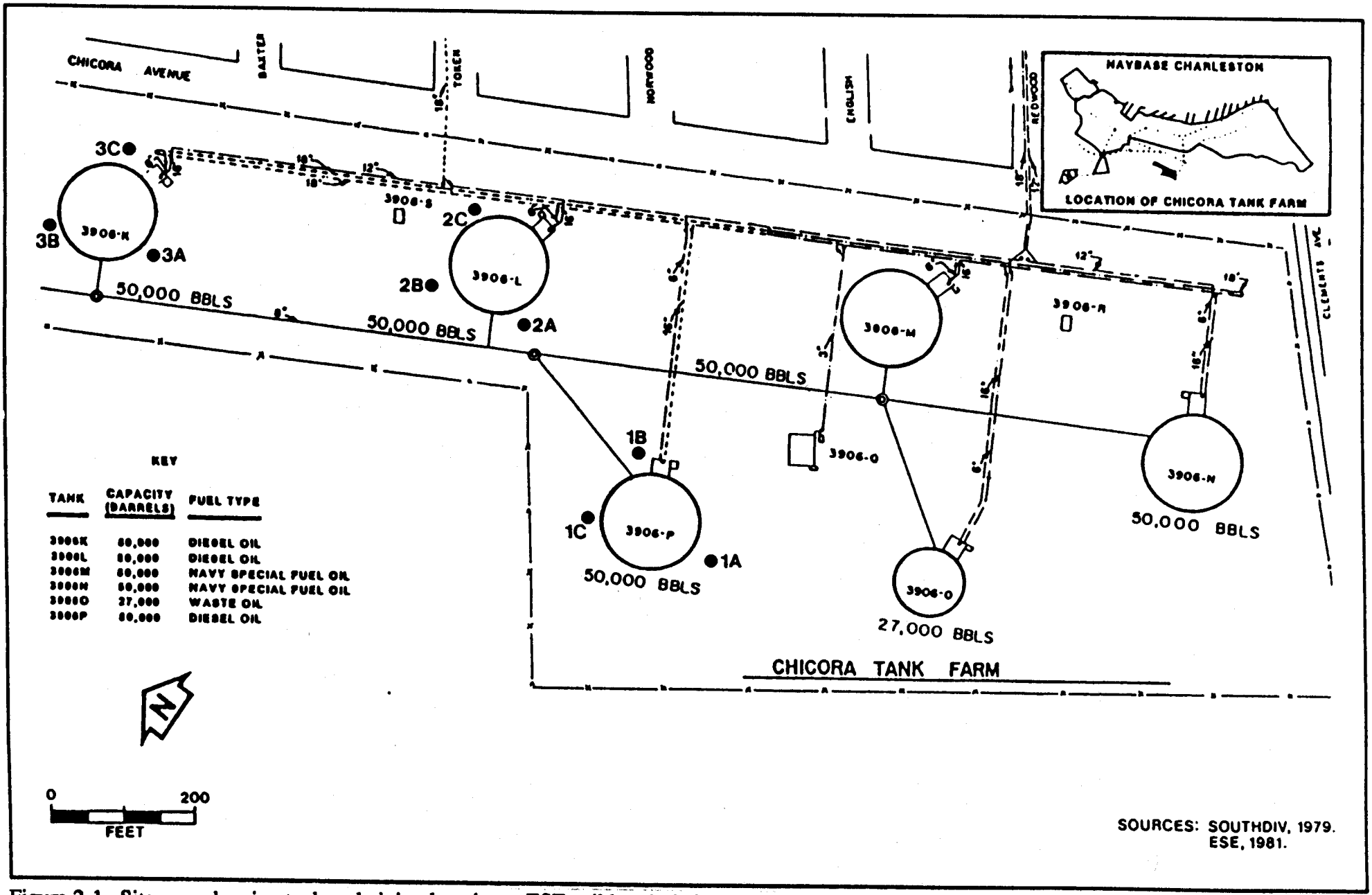


Figure 2-1. Site map showing tank and piping locations. ESE soil borehole locations are also indicated.

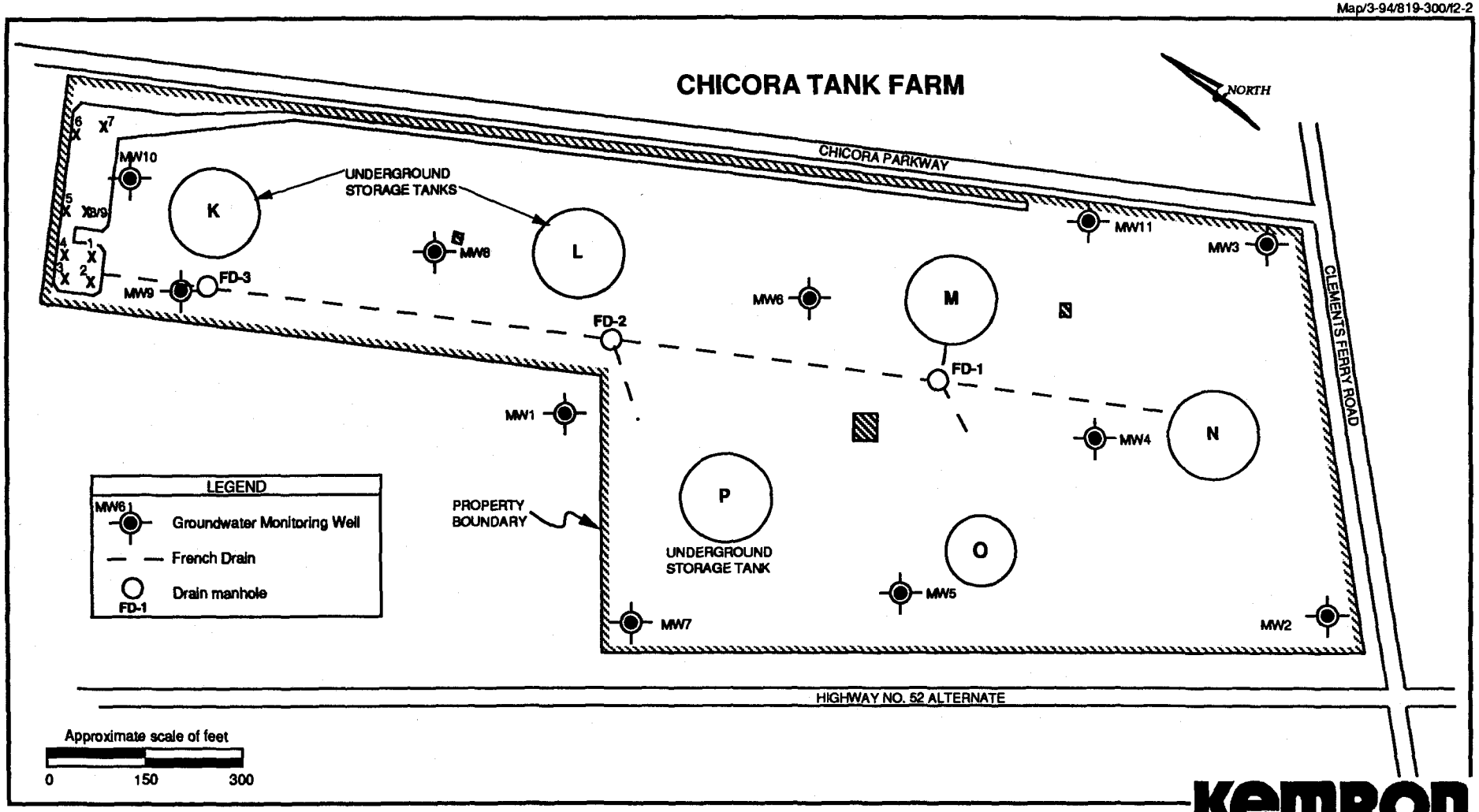


Figure 2-2. Site map showing french drain manhole and monitoring well locations.

KEMRON ENVIRONMENTAL SERVICES

2.1.3. Shallow Groundwater Monitoring Wells. Eleven water table groundwater monitoring wells, MW-1 through MW-11, are present at the site. The locations of these wells are shown in Figure 2-2. These wells were constructed in June 1990, during preliminary contamination assessment activities, to a depth approximately 17 ft. below ground surface. They are used to monitor groundwater in the uppermost aquifer. Placement and construction of wells is further described in Section 3.4 below.

2.2 CHARACTERISTICS OF STUDY AREA.

2.2.1 Topography and Physiography. The Charleston Naval Shipyard, CTF, and surrounding areas are located on the eastern edge of a low, narrow peninsula between the Ashley and Cooper Rivers. Topography is typical of South Carolina's lower coastal plain, with low-relief plains drained by meandering streams and rivers flowing toward the coast past occasional marine terrace escarpments. Elevations around CTF and the Shipyard range from approximately 20 ft. above Mean Sea Level (MSL) in the inland portions of the base, to sea level along the Cooper River. Although the southern end of the base was originally tidal marsh drained by Shipyard Creek and its tributaries, over the past 70 years, the marsh has been filled. Most of the base lies within the 100-yr flood zone (less than 10 ft. MSL).

2.2.2. Surface Hydrology. The southeastern portion of the shipyard is drained by Shipyard Creek while Noisette Creek drains the northern portion. Both creeks are tributaries of the Cooper River. Shipyard Creek is a small tidal tributary, approximately 1.5 miles in length, which flows in a southeasterly direction along the southwestern boundary of the base into the Cooper River. Noisette Creek is a tidal tributary, approximately 2.5 miles in length, which flows nearly due east from its headwaters in the City of North Charleston, across the northern portion of the base, and into the Cooper River.

Surface drainage over the remainder of the base discharges directly into the Cooper River which flows in a southerly direction to Charleston Harbor. Runoff from CTF flows into a shallow drainage ditch running along the northwestern edge of the site and eventually drains into a retention pond located on the far northwestern end of the property. The retention pond is connected to an adjoining marshy tidal slough that drains into the Cooper River.

2.2.3. Regional Geology. Geology of the Charleston area is typical of the southern Atlantic Coastal Plain. Surface exposures at the shipyard, in those limited areas which remain undisturbed, consist of recent and/or Pleistocene-age sands, silts, and clays of high organic content. These surface soils are underlain by a clastic calcareous clay known as the Cooper Marl. The Cooper Marl is, in turn, underlain by the Santee Limestone.

2.2.4. Soils. Surface soils at the base and the CTF have been extensively disturbed. Native soils consist of the fine-grain sand, silty sand, clayey sand, sandy clay, and clay that are typical of a terrigenous tidal marsh environment. Much of the southern portion of the base and tank farm area has been filled using dredged spoil consisting primarily of an unsorted mixture of sands, silts, and clays. Fill material at the tank farm is predominantly fine to medium grain clayey sand which has been graded into mounds over the fuel tanks.

2.2.5. Hydrogeology. Two distinct aquifers exist beneath the CTF and surrounding areas. A deep, confined aquifer is located in the Santee Limestone and a shallow water table aquifer is located within the near-surface sediments. Both the shallow aquifer and the Santee Limestone aquifer function as

sources of potable water. However, the shallow aquifer is not developed either at or in the vicinity of CTF and the naval base. Deeper water from the Santee Limestone (in the vicinity of CTF and the naval base) is not suitable for potable supply due to concentrations of dissolved solids ranging from 1,000 to 1,500 ppm. The Santee is used both on base and nearby for non-potable purposes.

The Cooper Marl, in the Charleston area, is essentially impermeable and acts as an upper confining layer for the Santee Limestone aquifer. The top of the Santee Limestone aquifer has a groundwater potentiometric elevation of approximately 15 ft. MSL. The hydraulic gradient in the area is generally to the southeast. Water from the confined aquifer of the Santee Limestone formation has an upward potential through the Cooper Marl. This upward potential protects the Santee from near-surface contamination.

Groundwater in the shallow aquifer surrounding CTF flows generally to the east. However, beneath CTF proper, the shallow aquifer usually flows to the centrally located french drain. Exceptions occur during low water table conditions. At such times, influence of the french drains is less and groundwaters beneath the southwest corner of CTF may reverse direction and move off-site.

2.3 SITE HISTORY. The fuel storage tanks at CTF were constructed in 1943 to hold heavy No. 6 fuel oil for use in boilers of Navy ships. Originally, all tanks were utilized for No. 6 storage except tank O, which was designed and utilized to hold waste oil. No. 6 fuel oil stored at CTF was replaced with Navy Special Fuel Oil (NSFO), another heavy fuel oil, in approximately 1960. NSFO stored in tanks K, L, and P was replaced in 1969 with Navy Distillate, a lighter diesel-like fuel oil. Tanks N and M continued to hold NSFO. Eventually, Navy Distillate was replaced with Diesel Fuel Marine (DFM). Tank N was taken out of service in July 1988 due to major electrical problems which continue to render the tank unusable. Tank M was taken out of service in March 1990 but remains serviceable. Currently, none of the tanks at the farm are in use; all tanks are closed.

Because the tanks were originally designed to hold heavy No. 6 fuel oil, which is too viscous to seep through concrete, the interior walls of the tanks were never lined to prevent seepage. Soon after the change to Navy Distillate, leakage of fuel through the tank walls into the pump rooms of tanks K, L, and P was observed. In 1986, SOUTHDIV commissioned Environmental Science and Engineering (ESE), Inc. to conduct a contamination assessment to determine whether or not the observed fuel seepage had resulted in significant soil and/or groundwater contamination around the tanks. Three soil samples were retrieved from each of nine boreholes drilled within approximately 40 ft. of tanks K, L, and P at depths of 10-15 ft. Borehole locations are shown on Figure 2-1.

Total petroleum hydrocarbons (TPH) and benzene, toluene, and xylenes (BTX) assays performed on these samples failed to detect any evidence of petroleum contamination. Water samples from each of the nine boreholes were examined for signs of petroleum contamination. The water samples reportedly exhibited no petroleum odor and only the water sample from ESE borehole #3B, located northwest of tank K, had a noticeable sheen. Based on these results, ESE concluded that the tanks were not releasing fuel into the surrounding soils.

A fuel spill reportedly occurred in 1986, when tank P was filled beyond capacity. The quantity of fuel released is unknown. The fuel reportedly flowed down the eastern slope of tank P.

On 11 August 1988, NSC personnel observed free-phase petroleum product in one of the access manholes of the french drain system at CTF. Samples were collected and laboratory analysis

confirmed the presence of a combination of DFM and NSFO. Following this discovery, a site investigation was initiated by SOUTHDIV at CTF to determine the need for a more detailed contamination assessment. The investigation was limited to inspection of the site; review of existing documents and drawings; and interviews and discussions with NSC and SOUTHDIV personnel.

During site inspections on 19 and 28 September 1988, free-phase petroleum product was observed on the water in each of the three french drain access manholes. Approximately two inches of product were observed in manholes FD-2 and FD-3, while only a petroleum sheen was visible in manhole FD-1. The concrete walls of manholes FD-1 and FD-2 appeared to be coated with a dark, oily sludge below the water surface. A light sheen was visible on the surface of the retention pond during these inspections, and stressed vegetation was observed surrounding the pond. Upon completion of the investigation, SOUTHDIV recommended that a preliminary contamination assessment be conducted to gauge the extent of subsurface contamination at CTF.

3. PRELIMINARY CONTAMINATION ASSESSMENT RESULTS

KEMRON Environmental Services, Inc. was contracted to perform the Preliminary Contamination Assessment at the CTF. Assessment activities included a soil gas survey, tracer survey, installation of soil borings and groundwater monitoring wells, sampling and analysis of subsurface soil samples, sediment samples, groundwater samples, and surface water samples. Investigation of site hydrogeology was also conducted.

3.1 TRACER SURVEY. A tracer survey and analysis was performed around the fuel storage tanks and associated piping in February and March 1990 by Tracer Research Corp. (TRC). The survey was initiated by the addition of diflourodibromomethane (DDM) tracer to each tank at the tank farm. Enough tracer was introduced to each of the tanks to make the concentration in the tanks approximately 10 ppm, had the tanks been filled near to capacity. Actual concentrations were higher. Soil vapor sampling was initiated after a three-week waiting period, which allowed the tracer time to diffuse throughout the storage and transport system and migrate through any leaks in the concrete tanks and associated piping systems.

For the survey, steel Schedule 80 1 in. OD pipes, capped with steel drive points, were driven into the bermed soils at 25 ft. intervals surrounding each tank. Each probe had an effective detection radius of approximately 10 to 12 ft. In order to maximize coverage and minimize testing time, sampling depths near the tanks were staggered. A soil-gas sample was retrieved at a depth of approximately six feet at every sampling location; a second sample was drawn from a depth of approximately twelve feet at every other sampling location. Steel drive points were also driven into the ground to depths ranging from one to three feet below grade in the vicinity of the fuel system piping at 25 ft. intervals along the entire length of the piping system. The tracer survey sampling locations are illustrated in Figure 3-1.

A vacuum pump was attached to each sample point with a hose and clasp. A vacuum was subsequently drawn on each sample point for approximately three minutes to extract gases present within the soils. Samples were extracted from each drive point stem by inserting an air-tight, pre-labeled, dedicated, hypodermic syringe through the attached hose. Trapped soil gases were collected within the syringe barrel when the syringe plunger was pulled back. Sample locations were recorded with ±1 ft. accuracy. Immediately following sample collection, the contents of each syringe were injected into a gas chromatograph (GC) connected to an electron capture detector (ECD). Sample results were available approximately ten minutes after injection.

The tracer survey consisted of a total of 351 soil gas samples retrieved from 274 sample point locations positioned around the tanks and along approximately 2600 ft. of piping (Figure 3-1). DDM was detected in only a limited number of samples, indicating a probable vapor leak or leaks in the ceiling of tank N. The data may also be interpreted to indicate that there are no substantial fuel leaks in the tanks or piping systems.

3.2 SOIL GAS SURVEY. A soil-gas survey was performed over the entire area of the Chicora Tank Farm between 27 February and 9 March 1990. Survey points were arranged on a 100 ft. grid, Figure 3-2. A 3/4-in. stainless steel slotted sample tube and drive point were driven into the ground to a total depth of 3 ft. (or to a shallower depth if the water table was encountered above 3 ft. below grade). A vacuum pump was connected to the sample tube and operated for approximately two minutes to draw organic vapors into the tube. Organic vapors in the tube were then assayed by venting the tube through a photoionization detector (PID, HNu model #161) calibrated to an

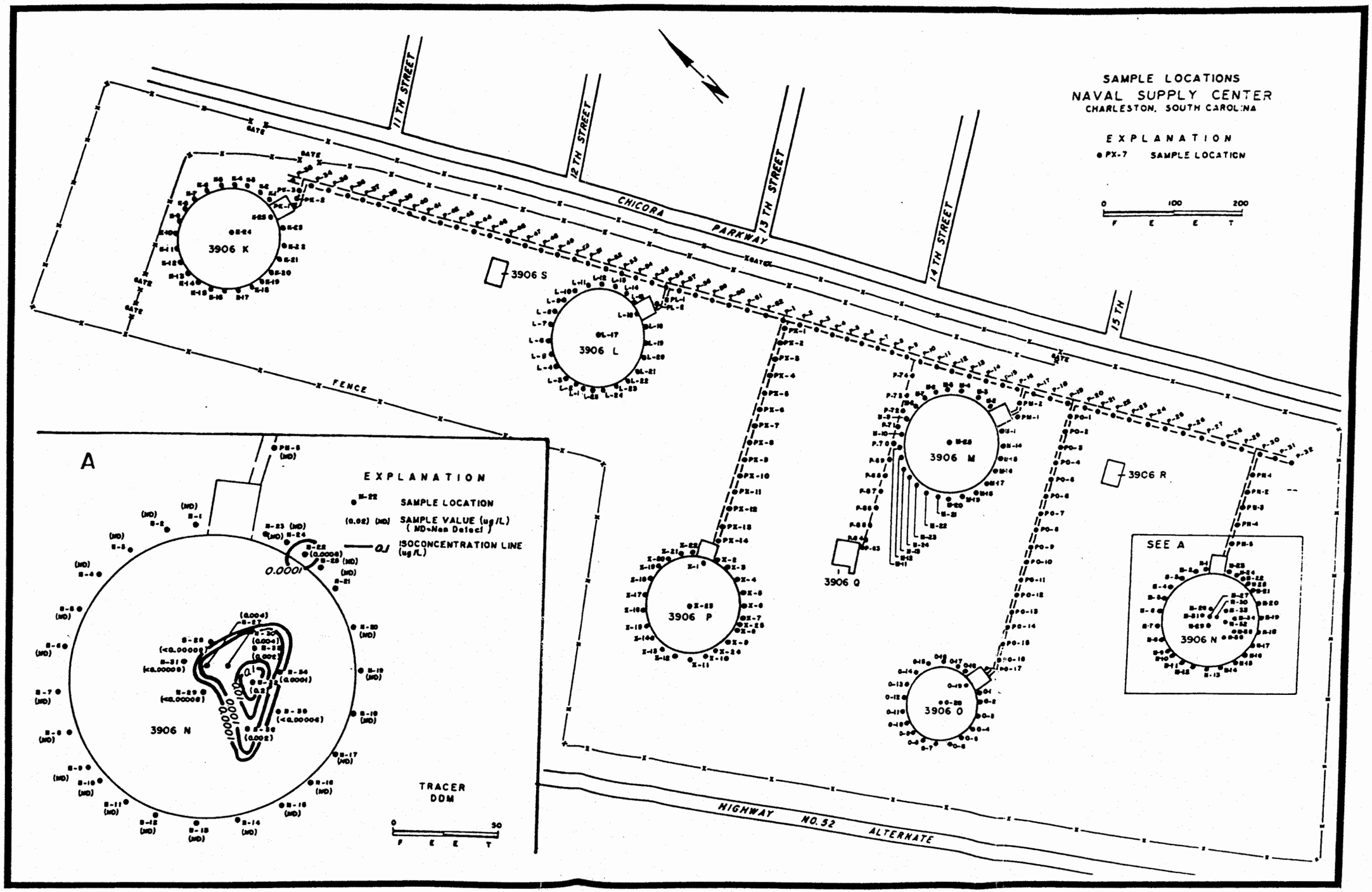


Figure 3-1. Tracer survey sample locations (from Tracer Research Corp. Report, March 1990).

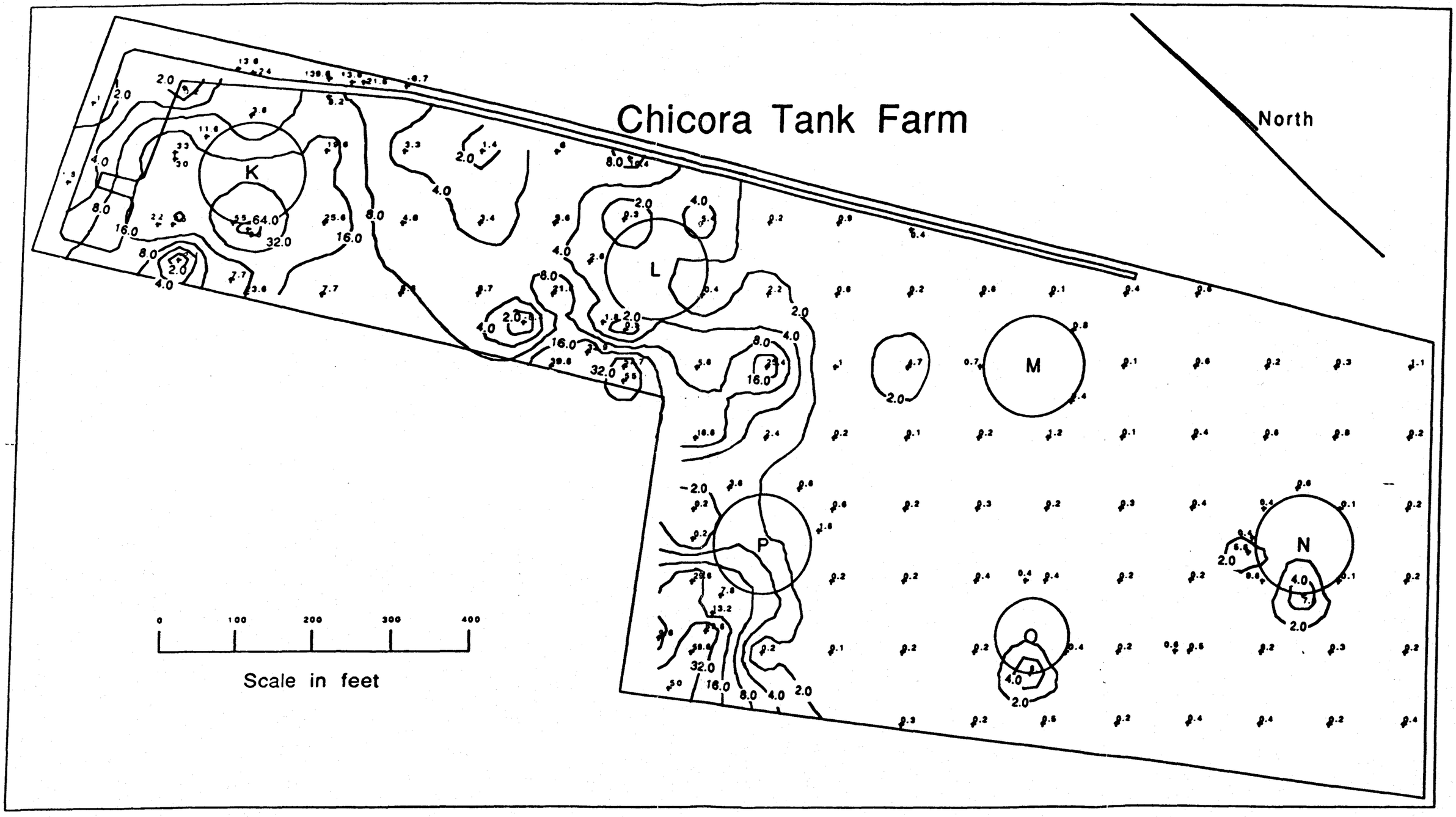


Figure 3-2. Soil-gas survey sampling locations and isopleth map.

isobutylene standard. The extent and concentration of organic vapors within soils were then determined from the soil-gas survey results. Petroleum contamination was presumed to be the source in those areas where relatively high organic vapor concentrations were detected.

Soil-gas survey results include few detections above 10 ppm. Levels as high as 57.7 and 69.6 ppm were encountered along the boundaries of the tank farm west of tanks L and P, adjacent to the Norman C. Toole Middle School. Soil-gas detections reaching concentrations of 64 ppm were also encountered immediately west of tank K near french drain manhole FD-3. A soil-gas concentration of 25.4 ppm was identified approximately two hundred feet south of tank L. Elsewhere, concentrations ranged from 0.1 to 19.6 ppm although an isolated reading of 139.6 ppm was encountered immediately adjacent to the fence along the northwest side of the site, near tank K. This reading, due to its location on the western wall of a steep drainage ditch, is assumed to be the result of hydrocarbon runoff from the nearby public road. An isopleth map of soil-gas concentrations is presented in Figure 3-2.

3.3 SOIL TEST BORINGS. Between 19 and 21 June, 1990, eleven soil test borings were installed by a South Carolina-certified drilling contractor at locations determined from soil-gas survey results. All locations were pre-approved by DHEC. Borings were advanced by a truck-mounted drill rig using 6 1/4-in. O.D. hollow stem auger flights to a depth approximately 7 ft. below the existing water table. Cuttings from each borehole (and soil samples retrieved from five-foot intervals within each borehole) were monitored by the field geologist for organic vapors using a PID to aid in detecting petroleum.

Soil sampling was performed in general accordance with ASTM D 1586. A standard 1.4 in. ID, 2 in. OD, split-barrel stainless steel sampler was used to collect soil samples. The sampler was first seated six inches into the ground to penetrate loose cuttings and then driven an additional foot with blows from a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler the final foot was recorded as a measure of soil strength and density. Soils were removed from the sampler and inspected for soil characteristics which were then recorded on borehole-specific logs. Borehole logs are included in Appendix A. All soiled equipment was decontaminated by steam cleaning between boreholes.

Two soil samples from each boring were selected for laboratory analysis. Samples for lab analysis were selected on the basis of PID results, and visual and olfactory observation. These samples were cooled to 4°C, sealed in appropriate pre-labelled containers, and shipped to the laboratory via overnight courier. Samples were assayed for Polynuclear Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons (TPH), and Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) by EPA methods 8100, 418.1, and 8020, respectively. Chain-of-custody was documented on all samples.

3.4 MONITORING WELL CONSTRUCTION. Monitoring wells were installed in each soil boring described above (see Figure 2-2 for locations). Augers were left in place during well installation to prevent collapse. Each well was constructed by installing 2 in. OD Sch. 40 PVC screen and riser pipe into each boring. A 10 ft. screen with 0.01 in. slots was placed so that screen extended approximately two to three feet above and seven to eight feet below the groundwater table at the time of drilling. Riser pipe was added to the screen on nine wells to set each top-of-casing approximately two feet above ground surface. Riser pipe was added to the remaining two wells to set each well approximately 0.5 ft. below ground surface to accommodate flush-mounted well covers.

The annular space adjacent to the screened section of each well was backfilled with a sand pack. Augers were pulled up as sand was poured into the annular space to a depth approximately one foot above the screened interval. A one foot thick bentonite pellet seal was placed above the sand pack. Portland cement was poured into the annular space from the bentonite seal to the ground surface. A vertical stick-up or flush-mounted protective steel well-head protector was placed over each well. The wells were completed with locking caps. Monitoring wells were constructed as near the South Carolina Well Standards and Regulations guidelines as the extremely high water table at the site would allow. Screen and riser lengths and intervals of grout were adjusted to compensate for this high water table. Monitoring well construction diagrams are included in Appendix A.

Details on well construction are presented in Table 3-1. Note that for MW-11, the water level is above the screened interval for the 6/25/90 measurements. Subsequent water level data also show that for other wells (e.g., MW-3 and MW-6), the water levels have been above the top of the screened intervals as well. In typical groundwater monitoring programs, where petroleum or other Light Non-Aqueous Phase Liquid (LNAPL) contamination is of concern, well screens are placed across the water table so that the presence or absence of free-phase layers may be assessed. Thus, the construction of some of the wells may be considered a problem in that, if free-phase petroleum was present on the water table, it would not be able to enter the well. However, because free-phase petroleum is not present (with the exception of a sheen) in the other wells or french drains in recent monitoring events, this problem is unlikely.

3.5 MONITORING WELL DEVELOPMENT, SAMPLING AND ANALYSIS. Monitoring wells were developed by bailing several well volumes from each well with a decontaminated, dedicated teflon bailer. Groundwater from development activities was containerized in a 55-gallon drum, staged on-site, and subsequently properly disposed of.

Groundwater samples were obtained approximately one day after installation and development of the monitoring wells. A minimum of three well volumes was purged from each well prior to sampling. Groundwater from each monitoring well was analyzed for temperature, pH, and specific conductivity in the field. Samples were retrieved from each well with dedicated bailers and poured into properly prepared containers. Sample containers were then sealed, cooled to 4°C, and shipped to the laboratory via overnight courier. Samples were assayed for TPH, PAH, and BTEX using EPA Methods 418.1, 8100, and 8020, respectively. Chain-of-custody was documented.

The purpose of groundwater sampling was to obtain data to determine the magnitude of groundwater contamination beneath the site and to establish a baseline for the subsequent quarterly groundwater monitoring program. A benzene concentration of 0.006 mg/L was detected in monitoring well MW-2. BTEX was not detected in the remaining monitoring wells. TPH and PAH constituents were not detected in groundwater samples retrieved from the site monitoring wells. Groundwater laboratory results from monitoring well sampling activities are summarized in Table 3-2 and Appendix B. During monitoring well development, a slight petroleum sheen was observed in the groundwater recovered from monitoring wells MW-3 and MW-9. No petroleum odor was detected in groundwater recovered from the site monitoring wells.

3.6 SURFACE WATER AND FRENCH DRAIN SAMPLING AND ANALYSIS. Water samples were retrieved from the french drain system underlying the CTF area and from the retention pond on the northwestern portion of the property. Samples from the retention pond were retrieved by submerging clean, pre-labeled sample containers and then opening the container to collect a grab

Table 3-1. Monitoring Well Construction Details
Chicora Tank Farm, Charleston, South Carolina

	Well ID	Date Installed	Well Diameter (inches)	Well Depth (feet)	Top of Well Casing Above Ground (feet)	Top of Casing Elevation* (ft-msl)	Screened Interval Elevation (ft-msl)	Groundwater Elevation 6/25/90 (ft-msl)
Monitoring Wells	MW-1	6-90	2	13.74	0.00	106.45	92.71 - 102.71	97.04
	MW-2	6-90	2	14.30	1.58	106.82	90.94 - 100.94	98.82
	MW-3	6-90	2	14.60	1.73	103.69	87.36 - 97.36	95.19
	MW-4	6-90	2	13.70	1.34	102.82	87.78 - 97.78	96.82
	MW-5	6-90	2	12.32	1.00	105.99	92.67 - 102.67	99.66
	MW-6	6-90	2	12.90	1.19	101.65	87.56 - 97.56	96.33
	MW-7	6-90	2	12.45	1.52	110.19	96.22 - 106.22	103.06
	MW-8	6-90	2	14.88	2.28	104.67	87.51 - 97.51	96.74
	MW-9	6-90	2	15.00	1.98	108.25	91.27 - 101.27	96.82
	MW-10	6-90	2	12.66	0.00	100.00	87.34 - 97.34	95.25
	MW-11	6-90	2	15.17	1.69	100.63	83.77 - 93.77	96.49
Drain Manholes	FD-1	ND	N/A	11.25	ND	107.42	N/A	
	FD-2	ND	N/A	8.17	ND	103.44	N/A	
	FD-3	ND	N/A	ND	ND	107.24	N/A	

Note: * Elevations referenced to an assumed datum of 100.00 ft-msl established at TOC for MW-10
ND = No Data
N/A = Not Applicable

Table 3-2. Summary of Monitoring Well Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
July 1990

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11
TPH	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzene	<0.005	**0.006**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Indeno (1,2,3 -cd) pyre	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibenzo (a,h) anthrace	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

All measurements in parts per million (mg/kg)

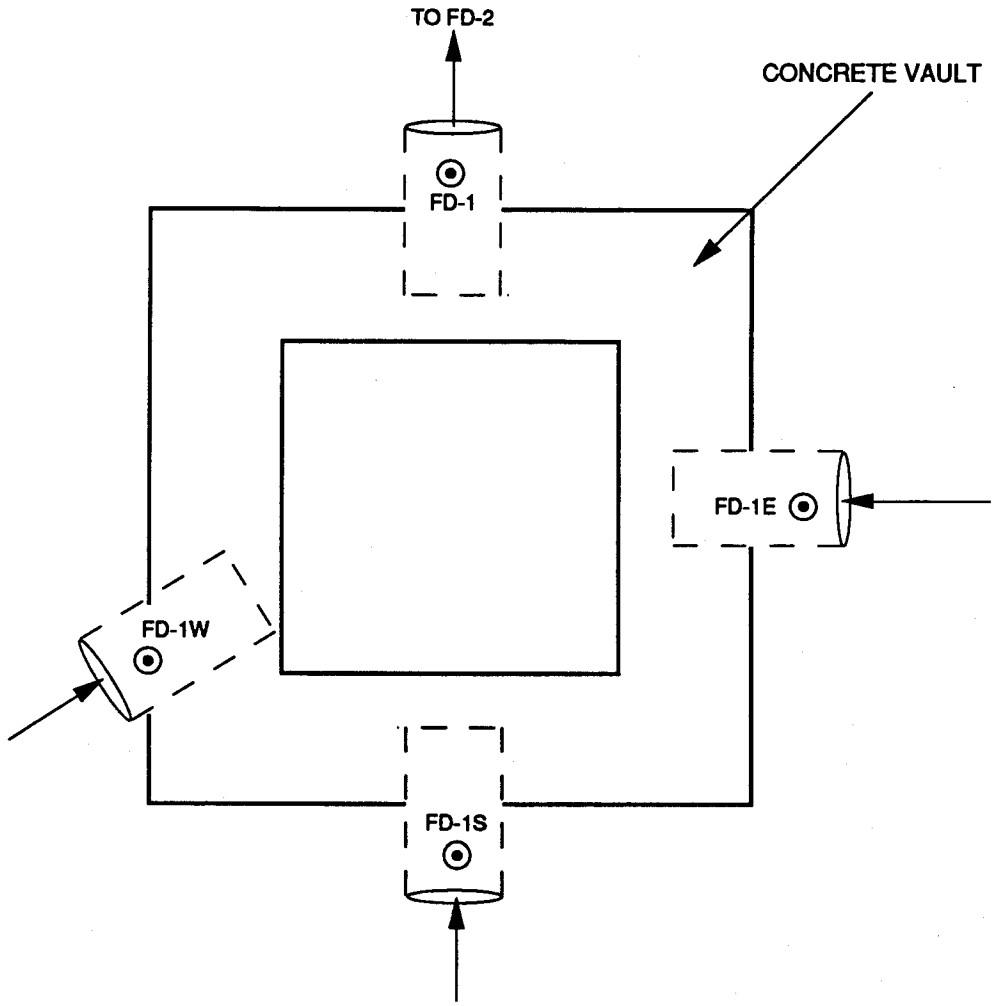
sample. French drain samples were retrieved by lowering a clean collection container into the drain and then transferring the collected sample to clean, pre-labeled sample containers. Following collection, the retention pond and french drain samples were sealed, cooled to 4°C, and shipped to the laboratory via overnight courier. Chain-of-custody procedures were documented. French drain samples were analyzed for PAH, TPH, and BTEX. Retention pond samples were analyzed for TPH and PAH. EPA methods 8100, 418.1, and 8020 were used by the laboratory for PAH, TPH, and BTEX assays, respectively.

Groundwater flowing through the french drain network present at the site was sampled in the following manner. Four groundwater samples were retrieved from manhole FD-1, three from manhole FD-2, and two from manhole FD-3. The samples retrieved from manhole FD-1 were designated FD-1, FD-1S, FD-1W, and FD-1E. The sample designated FD-1 was of waters leaving manhole FD-1. The samples designated FD-1S, FD-1W, and FD-1E were retrieved from the french drain laterals to tanks, N, O, and M, respectively. The samples retrieved from manhole FD-2 were designated FD-2, FD-2S, and FD-2W. The sample designated FD-2 was of waters leaving manhole FD-2. The samples designated FD-2S and FD-2W were of flows from manhole FD-1 and the lateral from tank P, respectively. The samples retrieved from manhole FD-3 were designated FD-3E and FD-3S. Samples FD-3E and FD-3S were from the tank K lateral and from the main drainage pipeline extending from manhole FD-2, respectively. French drain groundwater sample locations are shown on Figures 3-3, 3-4, and 3-5.

TPH and total PAH concentrations of 2 and 0.018 mg/L, respectively, were detected in sample FD-2. A TPH concentration of 2 µg/L was also detected in sample FD-2W. Extensive free-phase petroleum was observed in manhole FD-3 during collection of groundwater samples. TPH concentrations of 240 and 470 µg/L were detected in samples FD-3S and FD-3E, respectively. These groundwater samples were retrieved from beneath the free-phase petroleum present in manhole FD-3 and may have become contaminated during sampling, despite precautions. TPH was not detected in the remaining french drain samples. Neither BTEX nor PAH were detected in remaining french drain samples assayed. Petroleum detections in the french drain samples are shown on Table 3-3. Complete groundwater laboratory results are documented in Appendix B.

Two surface water samples were collected from the retention pond located on the northwestern end of the tank farm. Locations of the pond sample collection points are shown on Figure 3-4. The samples were assayed for TPH to determine the extent (if any) of petroleum contamination within the surface waters of the pond. No TPH was detected. Laboratory results from surface water assays are presented in Appendix B.

3.7 AQUIFER TESTING. Aquifer (slug-in) testing was performed to estimate the average, saturated horizontal hydraulic conductivity of aquifer materials near monitoring wells MW-3, MW-5, and MW-6. Testing was performed by raising the water level to the top of casing by adding tap water, then monitoring and recording the falling water level until recovery was complete. Recovery was considered to be complete when the water level stabilized near (>90%) pre-test conditions. Although a slug-out test may have been more appropriate for the wells, as the screens do extend above the water table, a useful estimation of the hydraulic conductivity can be derived.



MANHOLE FD-1 PLAN VIEW

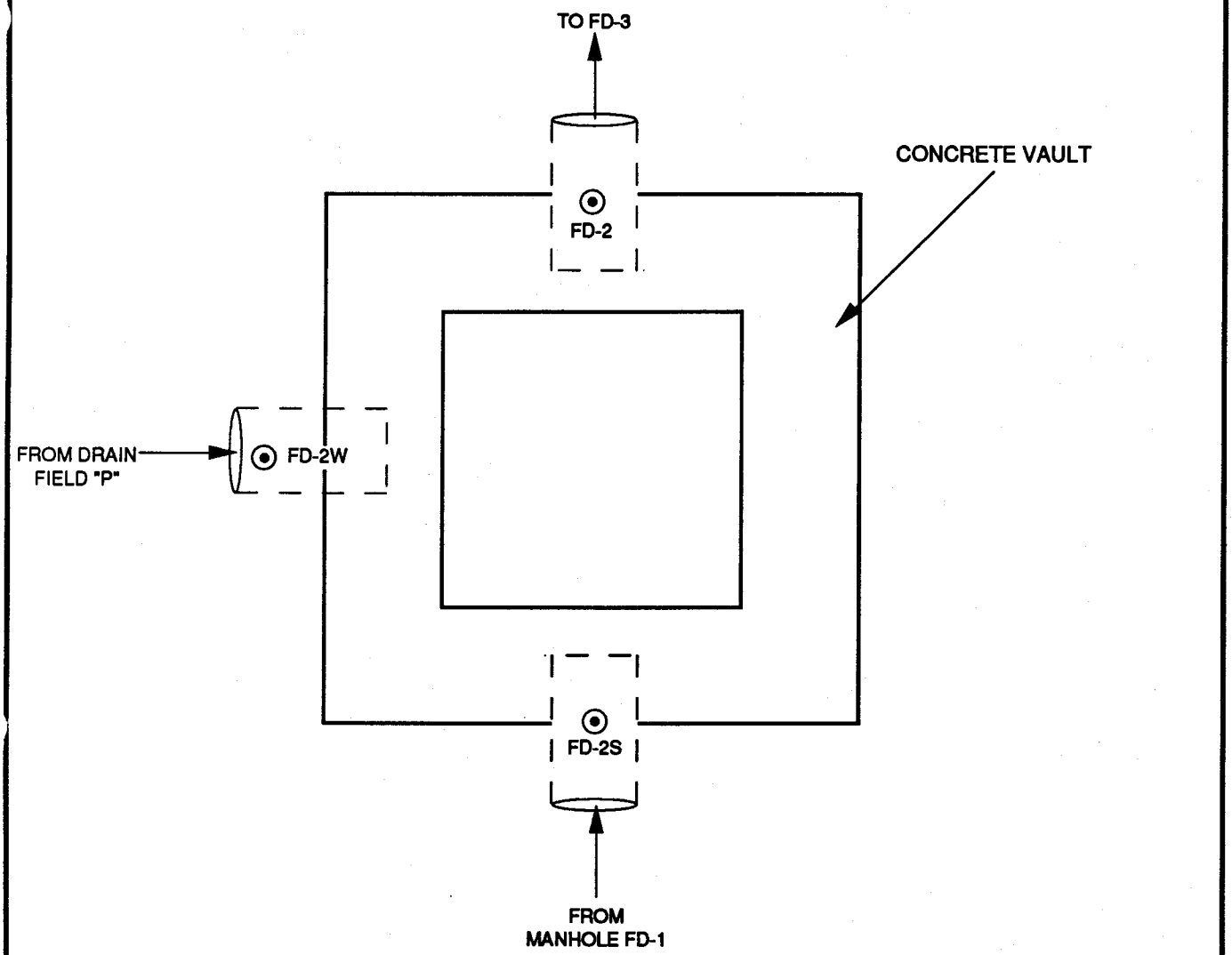
NORTH

LEGEND
FLOW DIRECTION
SAMPLE LOCATION

NOT TO SCALE

KEMRON ENVIRONMENTAL SERVICES

Figure 3-3. Groundwater sampling points and sample designations in manhole FD-1.



MANHOLE FD-2 PLAN VIEW

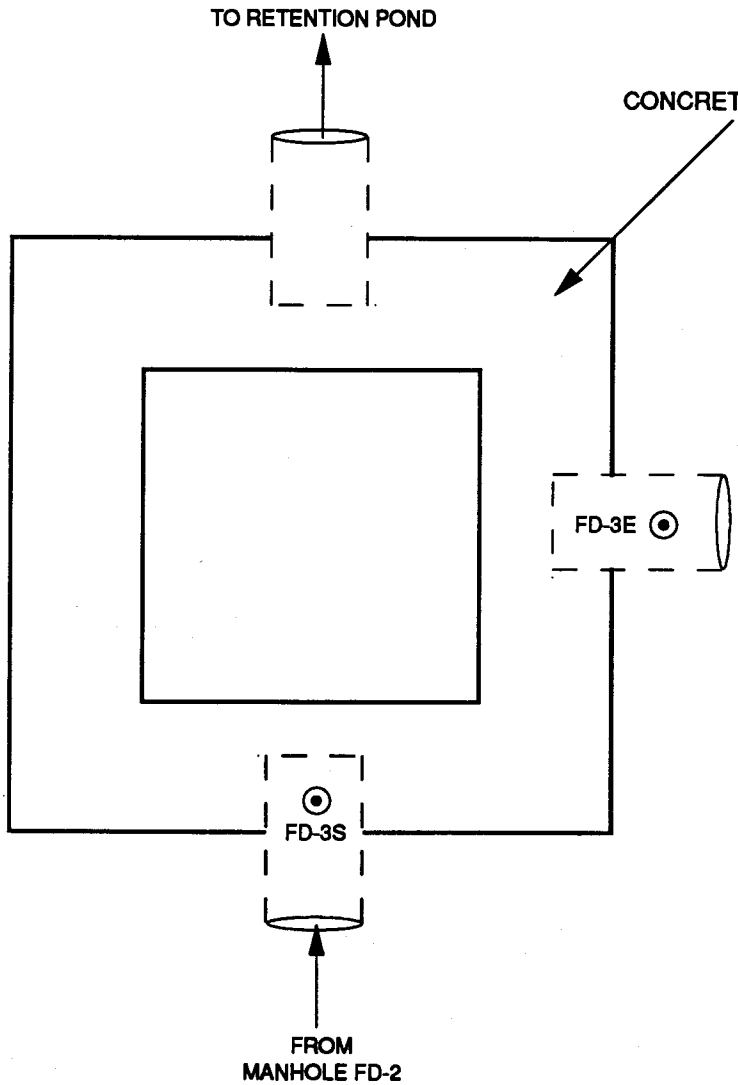
NORTH

LEGEND
FLOW DIRECTION
SAMPLE LOCATION

NOT TO SCALE

Figure 3-4. Groundwater sampling points and sample designations in manhole FD-2.

KEMRON ENVIRONMENTAL SERVICES



MANHOLE FD-3 PLAN VIEW

LEGEND
FLOW DIRECTION
SAMPLE LOCATION

NOT TO SCALE

Figure 3-5. Groundwater sampling points and sample designations in manhole FD-3.

KEMRON ENVIRONMENTAL SERVICES

Table 3-3. Summary of French Drain Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
July 1990

Compound	FD 1	FD 1-S	FD 1-W	FD 1-E	FD-2	FD 2-S	FD 2-W	FD 3-S	FD 3-E
TPH	<1	<1	<1	<1	**2**	<1	**2**	**240**	**470**
Benzene	na	na	na	na	<0.005	na	<0.005	na	na
Toluene	na	na	na	na	<0.005	na	<0.005	na	na
Ethylbenzene	na	na	na	na	<0.005	na	<0.005	na	na
Xylenes	na	na	na	na	<0.005	na	<0.005	na	na
Naphthalene	na	na	na	na	<0.001	na	<0.01	na	na
Acenaphthylene	na	na	na	na	**0.003**	na	<0.01	na	na
Acenaphthene	na	na	na	na	<0.001	na	<0.01	na	na
Fluorene	na	na	na	na	**0.006**	na	<0.01	na	na
Phenanthrene	na	na	na	na	<0.001	na	<0.01	na	na
Anthracene	na	na	na	na	<0.001	na	<0.01	na	na
Fluoranthene	na	na	na	na	<0.001	na	<0.01	na	na
Pyrene	na	na	na	na	**0.009**	na	<0.01	na	na
Benzo (a) anthracene	na	na	na	na	<0.005	na	<0.05	na	na
Chrysene	na	na	na	na	<0.005	na	<0.05	na	na
Benzo (b) fluoranthene	na	na	na	na	<0.005	na	<0.05	na	na
Benzo (k) fluoranthene	na	na	na	na	<0.005	na	<0.05	na	na
Benzo (a) pyrene	na	na	na	na	<0.005	na	<0.05	na	na
Indeno (1,2,3 -cd) pyrene	na	na	na	na	<0.005	na	<0.05	na	na
Dibenzo (a,h) anthracene	na	na	na	na	<0.005	na	<0.05	na	na
Benzo (g,h,i) perylene	na	na	na	na	<0.005	na	<0.05	na	na
Equivalent 1993 sample	***FD-1/C***	***FD-1/A***	***FD-1/D***	***FD-1/B***	***FD-2/C***	***FD-2/B***	***FD-2/A***	***FD-3***	

All measurements in parts per million (mg/kg)

na = not analyzed

Hydraulic conductivity values were calculated using the recovery rate and construction data from each well. Analyses were performed utilizing the method of Bouwer and Rice (1976). Aquifer flow rates were calculated using the following equation derived from Darcy's Law:

$$V = Ki/n$$

Where V = the aquifer flow rate in ft/sec
K = the average, saturated, horizontal hydraulic conductivity in ft/sec
i = the hydraulic gradient
n = the effective porosity of the aquifer

Flow rates at MW-3, MW-5, and MW-6 were calculated using measured hydraulic gradient values, well-specific hydraulic conductivity values, and estimated effective porosity values. Hydraulic gradient values of 0.0025 for monitoring well MW-3 and 0.0143 for monitoring wells MW-5 and MW-6 were used. Effective porosity was assumed to be 0.2, a conservative estimate. This value is lower than probable effective porosity values for soils observed at the site and should result in over-estimation of groundwater flow rates. Hydraulic conductivity and flow rate calculations for MW-3, MW-5, and MW-6 were previously presented in the PCAR/CAP.

Aquifer testing on monitoring well MW-3 found an average horizontal saturated hydraulic conductivity of 4.8×10^{-5} ft/s which yields a groundwater flow rate of approximately 19 ft/yr. Aquifer testing on monitoring well MW-5 found an average horizontal saturated hydraulic conductivity of 2.1×10^{-5} ft/s which yields a groundwater flow rate of approximately 49 ft/yr. Aquifer testing on monitoring well MW-6 found an average horizontal saturated hydraulic conductivity of 5.6×10^{-5} ft/s which yields a groundwater flow rate of approximately 127 ft/yr.

4. GROUNDWATER ASSESSMENT RESULTS

KEMRON's PCAR/CAP, included a recommendation for collection of additional site data. Specific activities, as further defined in the CTF Installation Work Plan, included the following: 1) the collection and analysis of sediment samples from the spill containment pond, 2) the removal and disposal of free-phase product in manhole FD-3, and 3) the collection and analyses of groundwater samples from the groundwater monitoring wells and underground drainage system for four consecutive quarters. The purpose of the quarterly groundwater monitoring was to develop a database of groundwater quality data. The installation work plan also included collection of additional soils data to further assess petroleum residues in site soils and spill containment pond sediments.

The 11 site monitoring wells were sampled and assayed quarterly for one year to monitor any increasing contaminant encroachment from off-site sources and to monitor for on-site fuel system leakage, should it occur. The french drain pipelines exposed within the three access manholes were sampled and assayed quarterly for a period of one year and to monitor any fuel system leakage should it occur. Additionally, quarterly monitoring of the french drain system was performed to help determine the source of petroleum film and dissolved petroleum contaminants in manhole FD-2 and measure the rate of free-phase petroleum accumulation which may occur in manhole FD-3.

Following collection and packaging, groundwater samples were transported to the laboratory and assayed for PAH, and BTEX using EPA Methods 8100, and 8020, respectively. Groundwater samples from well MW-5 were also assayed for RCRA metals. Groundwater samples collected from monitoring wells were also analyzed for temperature, pH, and specific conductivity in the field. Chain-of-custody was documented.

Eight groundwater samples were collected from the drain pipes in Manholes FD-1, FD-2, and FD-3 during each quarterly sampling event. These samples were designated "FD-1/A" through "FD-1/D", "FD-2/A" through "FD-2/C" and "FD-3." Groundwater sample locations are shown in Figures 4-1, 4-2 and 4-3. These samples were retrieved by inserting a decontaminated tygon hose several feet up each inlet and extracting the sample with a diaphragm pump or by dipping a decontaminated sampling device within the water to be sampled and transferring of the sample to labeled sample jars. Groundwater sample FD-3 was collected after the free-phase petroleum product was removed, as described above. With the exception of groundwater sample FD-3, petroleum odors were not detected in any groundwater samples.

4.1 RESULTS OF BASELINE GROUNDWATER SAMPLING AND ANALYSIS. The sampling and analysis conducted during the preliminary CAR is considered to be the baseline sampling and analysis event for the quarterly groundwater monitoring program. Results of this sampling and analysis are included in Chapter 3.

4.2 RESULTS OF FIRST QUARTERLY GROUNDWATER SAMPLING AND ANALYSIS. Between 16 and 17 March 1993, groundwater samples were collected from the eleven monitoring wells and designated as samples "MW-1" through "MW-11." In accordance with KEMRON quality assurance procedures, monitoring well MW-4 was resampled and designated as sample "MW-12," a blind duplicate.

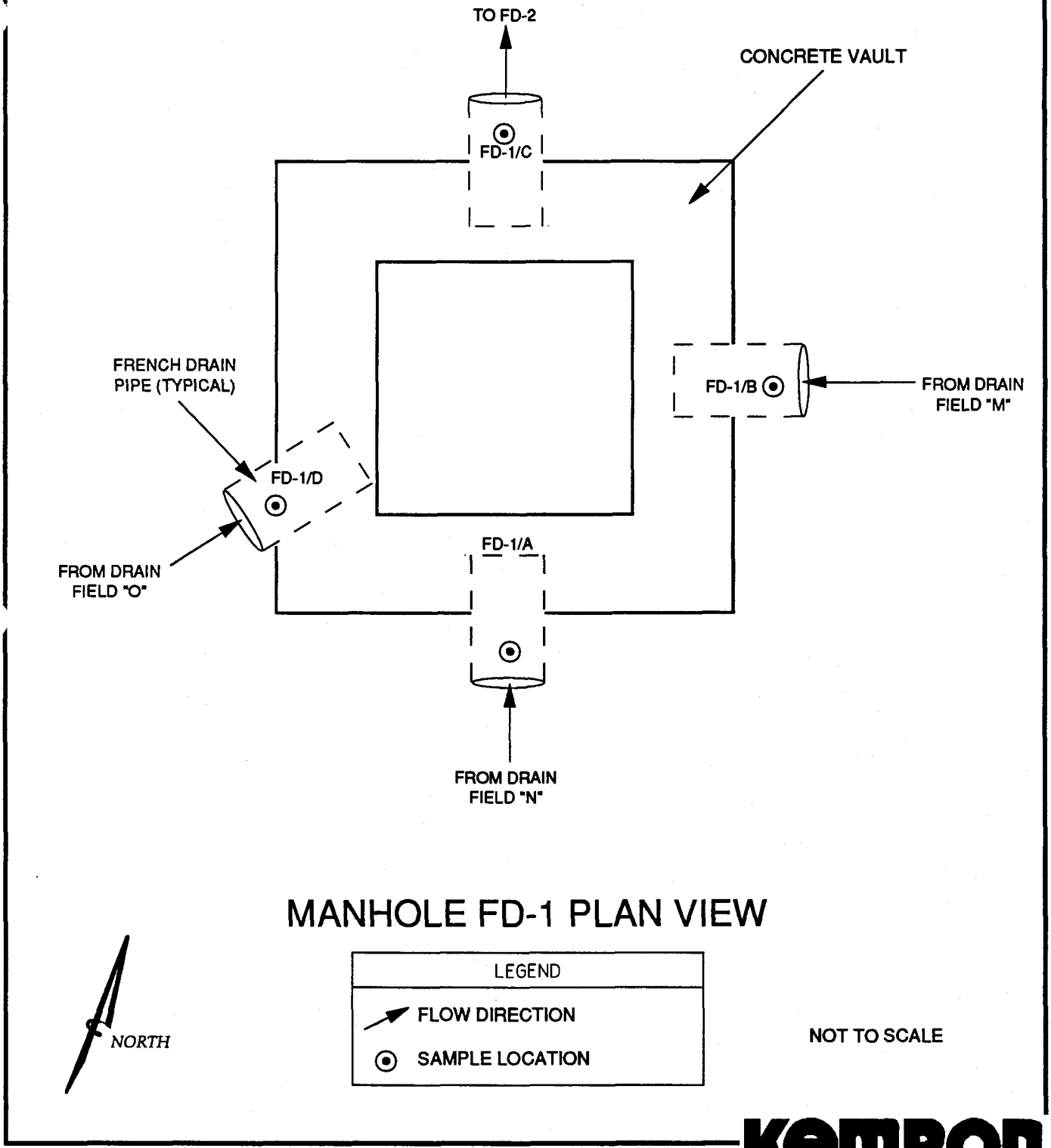
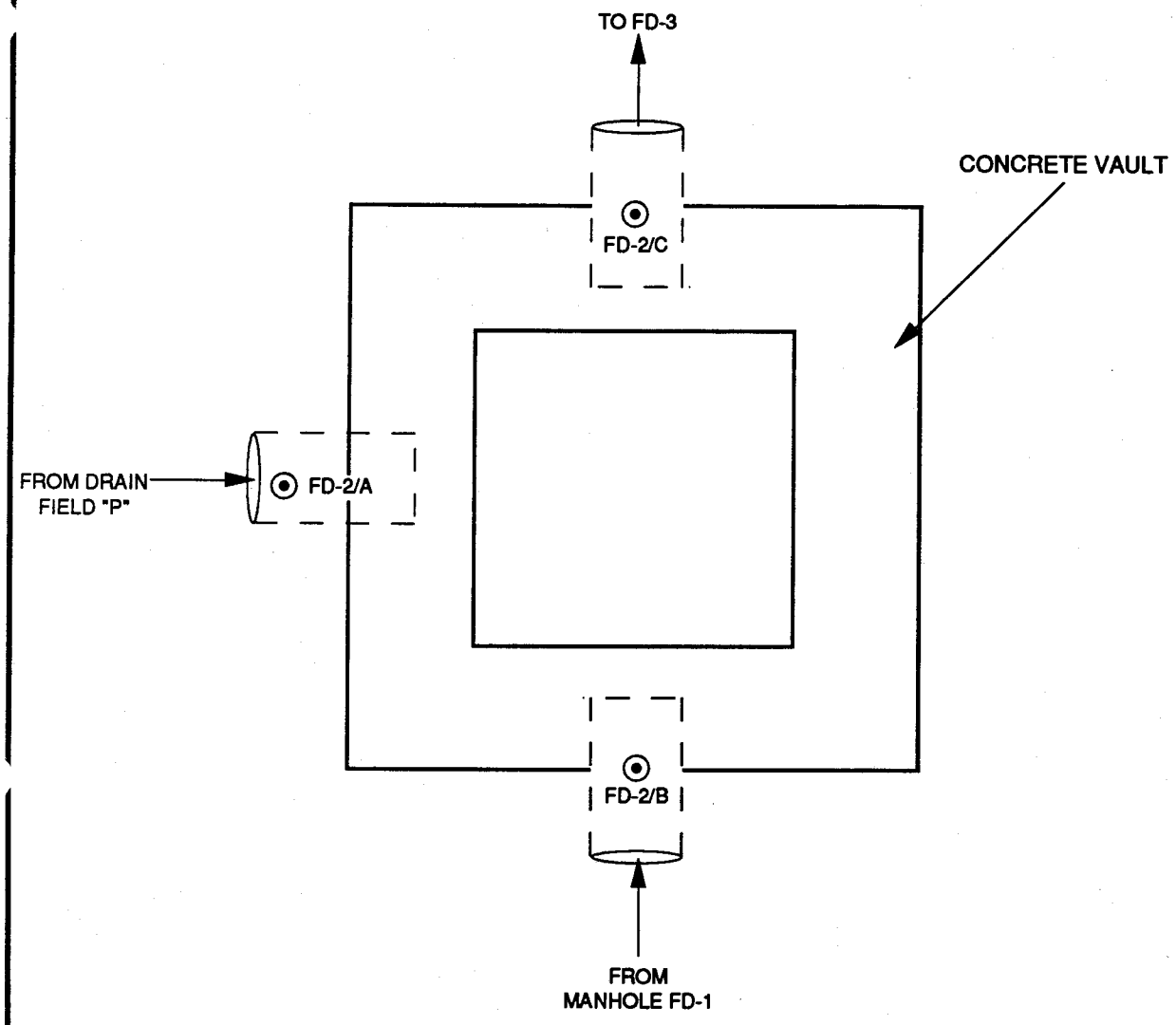


Figure 4-1. Groundwater sampling points in manhole FD-1.

KEMRON
ENVIRONMENTAL SERVICES



MANHOLE FD-2 PLAN VIEW

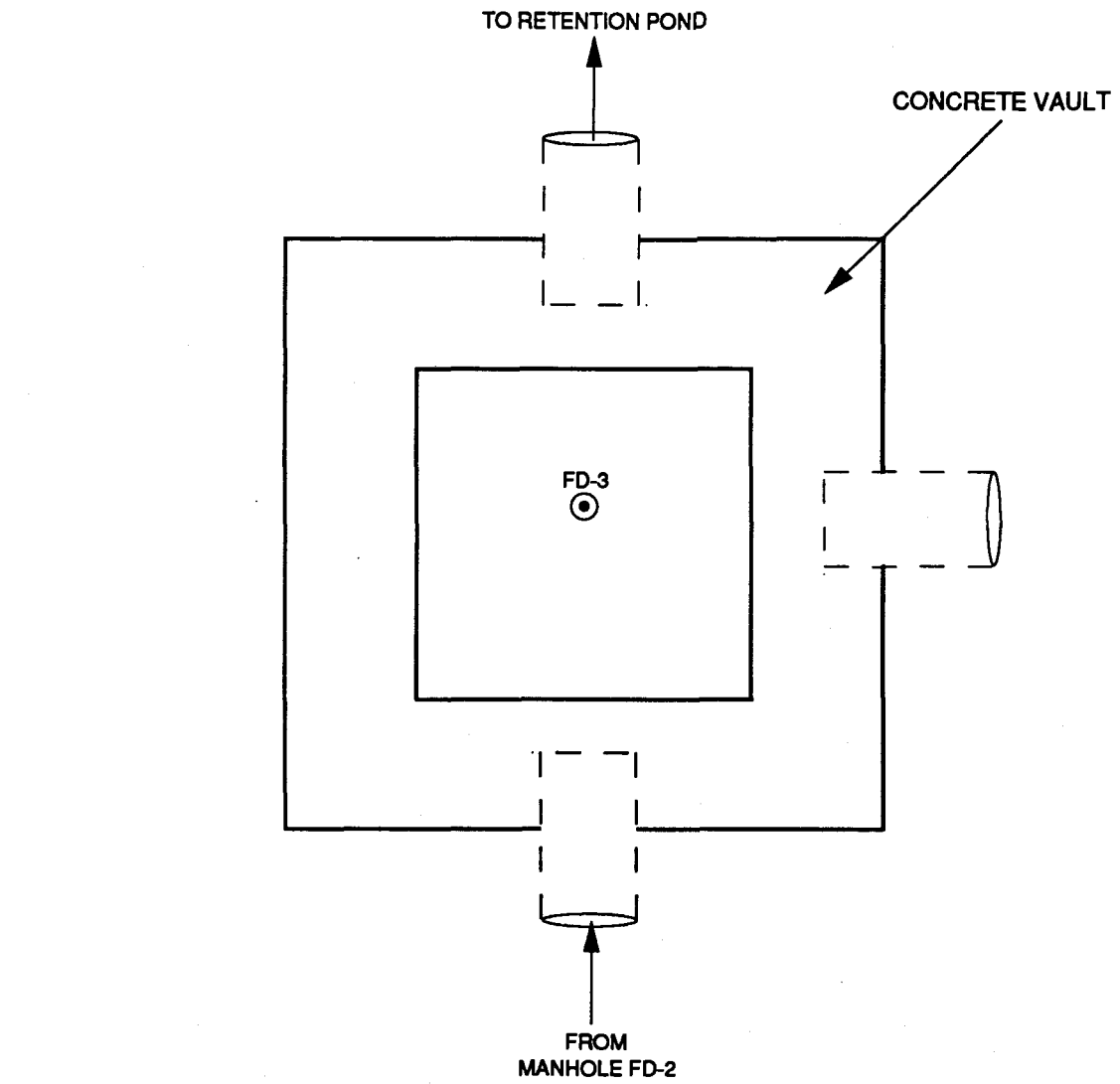
NORTH

LEGEND
FLOW DIRECTION
SAMPLE LOCATION

NOT TO SCALE

Figure 4-2. Groundwater sampling points in manhole FD-2.

KEMRON ENVIRONMENTAL SERVICES



MANHOLE FD-3 PLAN VIEW

LEGEND
FLOW DIRECTION
SAMPLE LOCATION

NOT TO SCALE

Figure 4-3. Groundwater sampling points in manhole FD-3.

KEMRON
ENVIRONMENTAL SERVICES

Results of groundwater analyses show that, with the exception of the sample collected from MW-4, that neither BTEX nor PAH constituents are present above method detection limits in groundwater from monitoring wells or manholes. Results show the presence of total xylenes at 0.007 mg/L in the sample from MW-4. Analytical results from the first quarterly sampling event are summarized in Tables 4-1 and 4-2. These data may be compared with the baseline analytical data from the July 1990 sampling event presented in Tables 3-2 and 3-3.

Quantitative inspection of the chromatogram generated during analysis of sample FD-3 indicated the presence of petroleum constituents, but PAH constituents were below method detection limits of 0.1 and 0.5 mg/L. These elevated detection limits were due to matrix interferences experienced during the sample analysis.

In addition to analyses for PAH and BTEX, the groundwater sample collected from MW-5 was analyzed for RCRA total metals. Arsenic (0.086 mg/L), barium (0.13 mg/L), chromium (0.04 mg/L), and mercury (0.0003 mg/L) were present in the unfiltered sample at levels above method detection limits. Laboratory documentation for all groundwater analyses is presented in Appendix C.

4.3 RESULTS OF SECOND QUARTERLY GROUNDWATER SAMPLING AND ANALYSIS.

Groundwater samples were collected from each of the 11 monitoring wells on site and from locations in the french drain system as previously discussed. Results of second quarter sampling and analysis show that neither BTEX nor PAH constituents are present above method detection limits in groundwater from manholes or monitoring wells. Analytical results from the second quarterly sampling event are summarized in Tables 4-3 and 4-4.

Inspection of the chromatogram, illustrated in Figure 4-4, generated during analysis of the sample collected from FD-3 indicates that petroleum constituents are present in the groundwater, but PAH constituents are below method detection limits of 0.5 and 2.5 mg/L. These elevated detection limits are due to matrix interferences experienced during the sample analysis.

In addition to analyses for PAH and BTEX, the groundwater sample collected from MW-5 was analyzed for RCRA total metals. Arsenic (0.01 mg/L), barium (0.31 mg/L), chromium (0.08 mg/L), and lead (0.02 mg/L) were present in the unfiltered sample at levels above method detection limits. Laboratory documentation for all groundwater analyses is presented in Appendix D.

4.4 RESULTS OF THIRD QUARTERLY GROUNDWATER SAMPLING AND ANALYSIS.

Groundwater samples were collected from each of the 11 monitoring wells on site and from locations in the french drain system as previously discussed. QA/QC samples included a duplicate of FD-3, a trip blank (BTEX only) and an equipment rinse blank.

Results of groundwater analyses show that neither BTEX nor PAH constituents were present above method detection limits in groundwater from manholes or monitoring wells. Analytical results from the third quarterly sampling event are summarized in Tables 4-5 and 4-6.

Inspection of the chromatograms, illustrated in Figure 4-5, generated during analysis of the equipment blank and samples collected from french drain manholes, indicates that petroleum constituents were present, but Method 8100 target analytes are below detection limits. The equipment blank chromatogram illustrates a typical chromatogram for an uncontaminated sample; the spectrum has a

Table 4-1. Summary of Monitoring Well Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
17-Mar-93

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-4 (dup)
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	**0.007**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Indeno (1,2,3 -cd) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibenzo (a,h) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Well	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
MW-5	**0.086**	**0.13**	<0.01	**0.04**	<0.005	**0.0003**	<0.004	<0.01

All measurements in parts per million (mg/kg)

Table 4-2. Summary of French Drain Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
17-Mar-93

Compound	FD-1/A	FD-1/B	FD-1/C	FD-1/D	FD-2/A	FD-2/B	FD-2/C	FD-3*
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.10
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.10
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.10
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.10
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.10
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.10
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.10
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.10
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5
Indeno (1,2,3 -cd) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5
Dibenzo (a,h) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5

All measurements in parts per million (mg/kg)

* High surrogate recovery and RIC suggest numerous co-eluting petroleum compounds

Table 4-3. Summary of Monitoring Well Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
8-Jun-93

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-4 (dup)
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Indeno (1,2,3 -cd) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibenzo (a,h) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Well	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
MW-5	**0.01**	**0.31**	<0.01	**0.08**	**0.02**	<0.0002	<0.004	<0.01

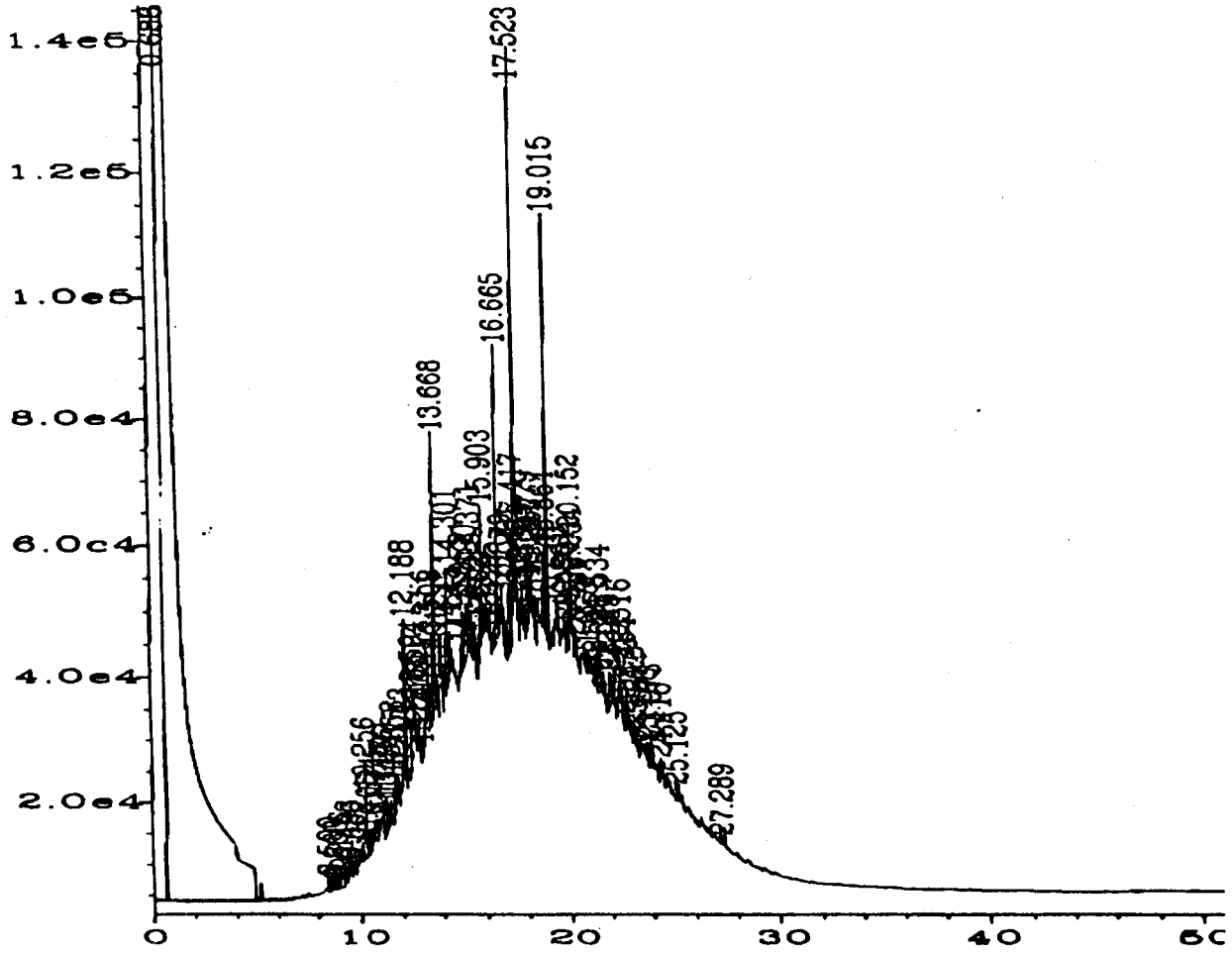
All measurements in parts per million (mg/kg)

Table 4-4. Summary of French Drain Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
8-Jun-93

Compound	FD-1/A	FD-1/B	FD-1/C	FD-1/D	FD-2/A	FD-2/B	FD-2/C	FD-3*
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.5
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<2.5
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<2.5
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<2.5
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<2.5
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<2.5
Indeno (1,2,3 -cd) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<2.5
Dibenzo (a,h) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<2.5
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<2.5

All measurements in parts per million (mg/kg)

* High surrogate recovery and RIC suggest numerous co-eluting petroleum compounds



Data File Name : C:\HPCHEM\1\DATA\061493\011F0101.D
Operator : HEMA VILASAGAR
Instrument : HPII FID/
Sample Name : 06-196-04 100X
Run Time Bar Code:
Acquired on : 14 Jun 93 08:13 PM
Report Created on: 15 Jun 93 12:54 PM

Page Number : 1
Vial Number : 11
Injection Number : 1
Sequence Line : 1
Instrument Method: 8100FRNT.MT
Analysis Method : 8100FRNT.MT

Figure 4-4. Reconstructed ion chromatogram for groundwater sample FD-3.

Date: 7-22-93 | Project#:6544

KEMRON
ENVIRONMENTAL SERVICES

Table 4-5. Summary of Monitoring Well Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
8-Sep-93

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Indeno (1,2,3 -cd) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibenzo (a,h) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Well	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
MW-5	**0.041**	**0.44**	<0.01	**0.09**	**0.03**	**0.0003**	<0.004	<0.01
Federal MCL	0.05	2	0.005	0.1	0.015*	0.002	0.05	NS

All measurements in parts per million (mg/kg)
*at-the-tap action level
NS = No MCL Standard

Table 4-6. Summary of French Drain Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
8-Sep-93

Compound	FD-1/A	FD-1/B	FD-1/C	FD-1/D	FD-2/A	FD-2/B	FD-2/C	FD-3*	MW-12**
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Indeno (1,2,3 -cd) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibenzo (a,h) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

All measurements in parts per million (mg/kg)

**MW-12 is blind duplicate of FD-3.

* High surrogate recovery and RIC suggest numerous co-eluting petroleum compounds

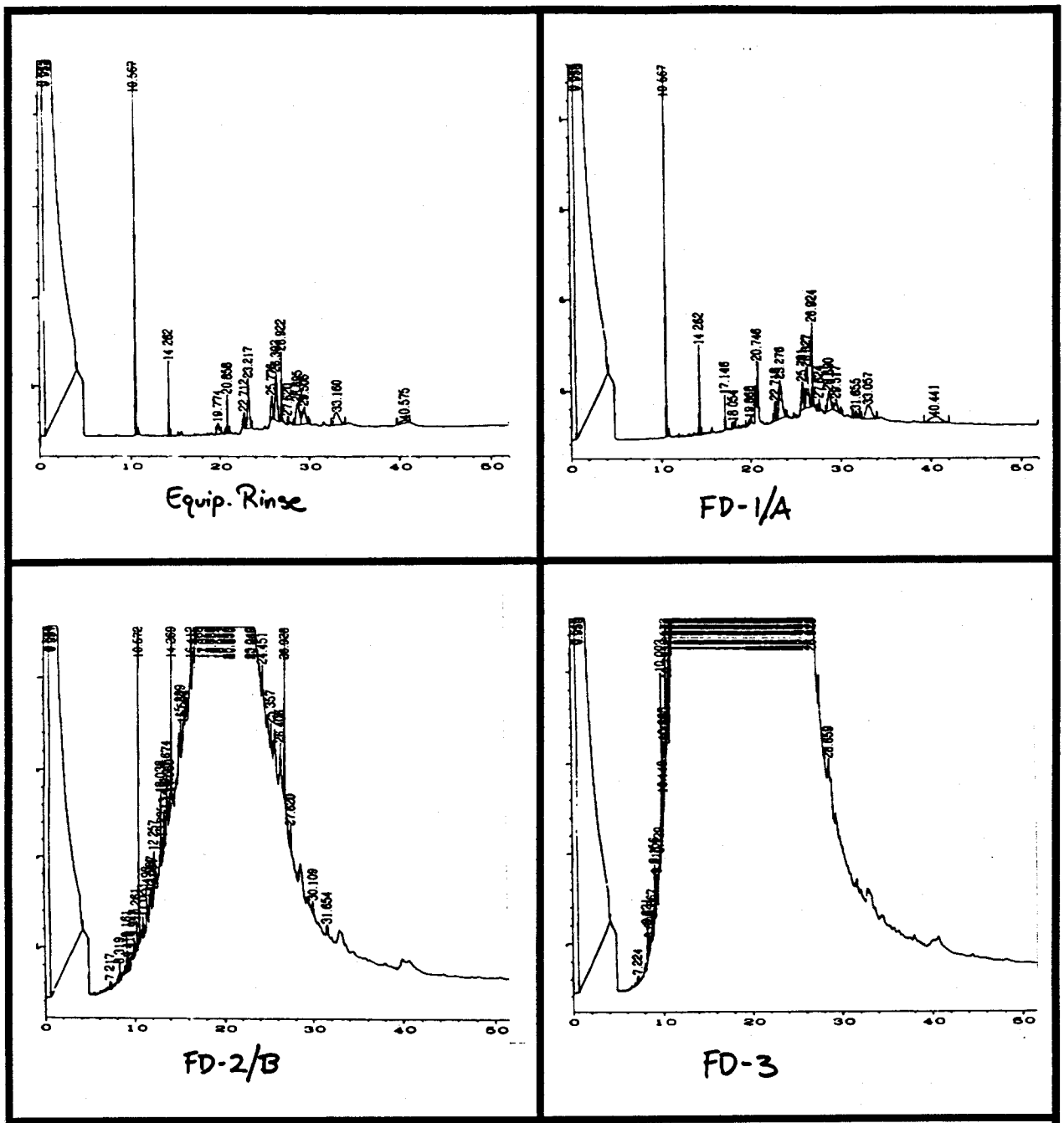


Figure 4-5. Representative reconstructed chromatograms from M8100 (PAH) analyses of equipment rinse sample and groundwater samples collected from french drain manholes. Vertical axes = FID intensity and horizontal axes = elution time in minutes.

relatively flat baseline with intermediate spikes corresponding to elution times for standard compounds. Method 8100 target compounds are not present in the spectrum.

In contrast, the chromatograms for samples collected from french drain manholes have elevated baselines, which form the large peaks, spanning from approximately 10-30 on the horizontal axis coordinates, in the chromatograms generated during analysis of sample FD-2/B and FD-3. The shape and location of these baseline "humps" are consistent with those expected for heavy fraction petroleum distillates. Although from these spectra it is apparent that a wide variety of petroleum compounds are present in the samples, Method 8100 PAH compounds are not present above method detection limits.

In addition to analyses for PAH and BTEX, the groundwater sample collected from MW-5 was analyzed for RCRA total metals. Arsenic (0.041 mg/L), barium (0.44 mg/L), chromium (0.09 mg/L), lead (0.03 mg/L), and mercury (0.0003 mg/L) were present in the unfiltered sample at levels above method detection limits. As illustrated in Table 4-5, where the metals results are compared to MCLs, lead is the only metal that exceeds the MCL. Laboratory documentation for all groundwater analyses is presented in Appendix E.

4.5 RESULTS OF FOURTH QUARTERLY GROUNDWATER SAMPLING AND ANALYSIS.

Groundwater samples were collected from each of the 11 monitoring wells on site and from locations in the french drain system as previously discussed. QA/QC samples included a duplicate of FD-3, a trip blank (BTEX only) and an equipment rinse blank.

Results of groundwater analyses show that neither BTEX nor PAH constituents were present above method detection limits in groundwater from manholes or monitoring wells. Analytical results from the fourth quarterly sampling event are summarized in Tables 4-7 and 4-8.

In an effort to more fully characterize the contaminants within samples exhibiting elevated baselines in historical PAH analyses, two groundwater samples, MW-2 and FD-3, were submitted to the laboratory for Semivolatiles Analyses by Method 8270. The analysis revealed the presence of non-target analytes. In an attempt to identify these, the spectral data were compared to the NBS library. Few matches were found at the required 85% matching criteria. However, the closest matching compounds are primarily hydrocarbons, as indicated in Table 4-9. Library search data, and an accompanying case narrative, are presented in Appendix F.

A number of observations concerning these data are noteworthy. First, the total concentration of all of these compounds is low, 1.052 mg/L, with the predominant constituent, dimethyl-heptadecane, a common hydrocarbon, present at less than 0.2 mg/L. Qualitatively, the compounds are predominantly hydrocarbons or substituted hydrocarbons (primarily methylated compounds). It must be recognized, however, that these compounds are listed here because they are not good identification matches and should be considered as "next best guesses." In addition, the list is biased, based only on the data contained in the computer database. Not every naturally-occurring compound has been identified, nor are all those identified in the database.

It is therefore not surprising that good matches could not be obtained for a number of the chromatogram peaks generated. Regardless, the actual compounds isolated should be close in chemical and physical properties (and therefore also in structure) to the compounds named. For example, a twenty-carbon hydrocarbon chain has ten different positions for a single methylation, each

Table 4-7. Summary of Monitoring Well Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
8-Dec-93

Compound	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Indeno (1,2,3 -cd) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dibenzo (a,h) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Well	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
MW-5	**0.013**	**0.18**	<0.01	**0.06**	**0.012**	<0.0002	<0.004	<0.01
Federal MCL	0.05	2	0.005	0.1	0.015*	0.002	0.05	NS

All measurements in parts per million (mg/kg)
*at-the-tap action level
NS = No MCL Standard

Table 4-8. Summary of French Drain Groundwater Sample Analyses
Chicora Tank Farm, Charleston, South Carolina
9-Dec-93

Compound	FD-1/A	FD-1/B	FD-1/C	FD-1/D	FD-2/A	FD-2/B	FD-2/C	FD-3	MW-12**
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylenes	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Naphthalene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Acenaphthylene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Acenaphthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Fluorene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Phenanthrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Anthracene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Fluoranthene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Pyrene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Benzo (a) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005
Chrysene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005
Benzo (b) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005
Benzo (k) fluoranthene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005
Benzo (a) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005
Indeno (1,2,3 -cd) pyrene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005
Dibenzo (a,h) anthracene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005
Benzo (g,h,i) perylene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005

All measurements in parts per million (mg/kg)

**MW-12 is blind duplicate of FD-3.

Table 4-9. Results of NBS Library Search from Method 8270 (semivolatiles) analysis of sample FD-3

Best-Fit Compound	% Fit	Scan Number	Concentration	Class
1,4-undecadiene, (z)-	38.5	864	0.053	hydrocarbon
decane, 1-(nonylthio)-	53.2	885	0.046	hydrocarbon
1H-indene, octahydro-2,2,4,4,7,7-hexamethyl-, trans	72.0	891	0.050	hydrocarbon
hydroxylamine, o-decyl	63.2	902	0.078	amine of decane
1H-indene, octahydro-2,2,4,4,7,7-hexamethyl-, trans	47.3	911	0.026	hydrocarbon
1H-indene, octahydro-2,2,4,4,7,7-hexamethyl-, trans	61.4	917	0.080	
1,7-nonadiene, 4,8-dimethyl-	50.1	934	0.054	hydrocarbon
9,12-octadecadienoic acid (z,z)-, phenylmethyl ester	37.7	944	0.030	long chain fatty acid
pentalene, octahydro-1-(2-octyldecyl)-	44.0	962	0.032	
tridecane, 3-methyl-	47.3	971	0.061	methylated hydrocarbon
3-octadecyne	38.2	983	0.043	hydrocarbon
octane, 1,2-dibromo	32.0	988	0.026	octane with 2 bromines
2,6-octadienal, 3,7-dimethyl-	20.5	996	0.030	octane
pyridinium, 1-hexadecyl-, chloride, monohydrate	44.3	1000	0.030	coal tar derivative
tridecanal	33.7	1008	0.035	
dodecane, 2,6,10-trimethyl-	55.1	1023	0.088	hydrocarbon
3-octadecene, (e)-	61.0	1046	0.048	hydrocarbon
11-dodecen-1-ol, 2,4,6-trimethyl-, (r,r,r)-	34.8	1052	0.024	long chain alcohol
heptadecane, 2,6-dimethyl-	78.1	1058	0.192	hydrocarbon
tetracontane, 3,5,24-trimethyl-	63.0	1336	0.026	

Results presented in mg/L

producing a different, but similar derivative. As more substitutions are made, the resulting possibilities increase exponentially. All of the compounds listed are either hydrocarbons or close relatives, or degradation, reaction, or breakdown products of hydrocarbons. It is most unlikely then, that any exotic, potentially toxic compounds are present in the sample. The sample data are consistent with the presence of a refined petroleum product(s) containing high molecular weight hydrocarbons. Such products would be commonly used commercially as lubricating oils, greases, and heavy, partially refined fuel oils.

In addition to analyses for PAH and BTEX, the groundwater sample collected from MW-5 was analyzed for RCRA total metals. Arsenic (0.013 mg/L), barium (0.18 mg/L), chromium (0.06 mg/L), and lead (0.012 mg/L) were present in the unfiltered sample at levels above method detection limits. In Table 4-7, the metals results are compared to MCLs.

4.6 GROUNDWATER FLOW DIRECTION. To determine the groundwater flow direction, depth to groundwater measurements were taken in the wells prior to each sampling event. These measurements are summarized in Table 4-10. Using the depth to groundwater measurements, a potentiometric surface map was prepared for each sampling event. The resulting potentiometric surface maps are illustrated in Figures 4-6, 4-7, 4-8, 4-9, and 4-10. As shown in Figures, it is apparent that the dominant groundwater flow direction at the site is consistently toward the central french drain line and retention pond.

4.7 FREE-PHASE PRODUCT REMOVAL. On March 18, 1993, approximately 70 gallons of free-phase product were removed from manhole FD-3. Using a clean, 5-gallon container on a cord, the product was bailed from the open manhole and containerized in two 55-gallon drums. The free product appeared as a black, oily sludge containing grass and debris, which floated on top the water within the manhole. The drums containing the product were then sealed and secured on site.

KEMRON is currently arranging for disposal of the petroleum product by a local waste oil reclamation firm.

Table 4-10. Water depth and elevation data from PCAR and quarterly monitoring events.

Well #	PCAR		1st Quarter		2nd Quarter		3rd Quarter		4th Quarter	
	Depth to Water (ft.)	Elevation	Depth to Water (ft.)	Elevation	Depth to Water (ft.)	Elevation	Depth to Water (ft.)	Elevation	Depth to Water (ft.)	Elevation
MW-1	97.04	98.26	7.98	98.47	8.68	97.77	9.02	97.43	9.17	97.28
MW-2	98.82	100.76	5.86	100.96	6.69	100.13	6.33	100.49	6.58	100.24
MW-3	95.19	98.71	5.35	98.34	5.86	97.83	4.77	98.92	5.44	98.25
MW-4	96.82	97.76	5.42	97.40	5.93	96.89	5.51	97.31	5.82	97.00
MW-5	99.66	100.80	5.73	100.26	6.09	99.90	6.17	99.82	6.10	99.89
MW-6	96.33	97.73	4.41	97.24	5.19	96.46	3.31	98.34	5.02	96.63
MW-7	103.06	104.42	5.48	104.71	6.28	103.91	6.34	103.85	6.50	103.69
MW-8	96.74	97.96	6.92	97.75	7.76	96.91	8.21	96.46	8.10	96.57
MW-9	96.82	97.46	10.70	97.55	11.33	96.92	11.48	96.77	11.56	96.69
MW-10	95.25	96.37	3.78	96.22	4.12	95.88	4.20	95.80	4.25	95.75
MW-11	96.49	98.19	2.55	98.08	3.47	97.16	1.94	98.69	2.93	97.70

Note: Elevations referenced to an assumed datum of 100.00 ft-msl established at TOC for MW-10.

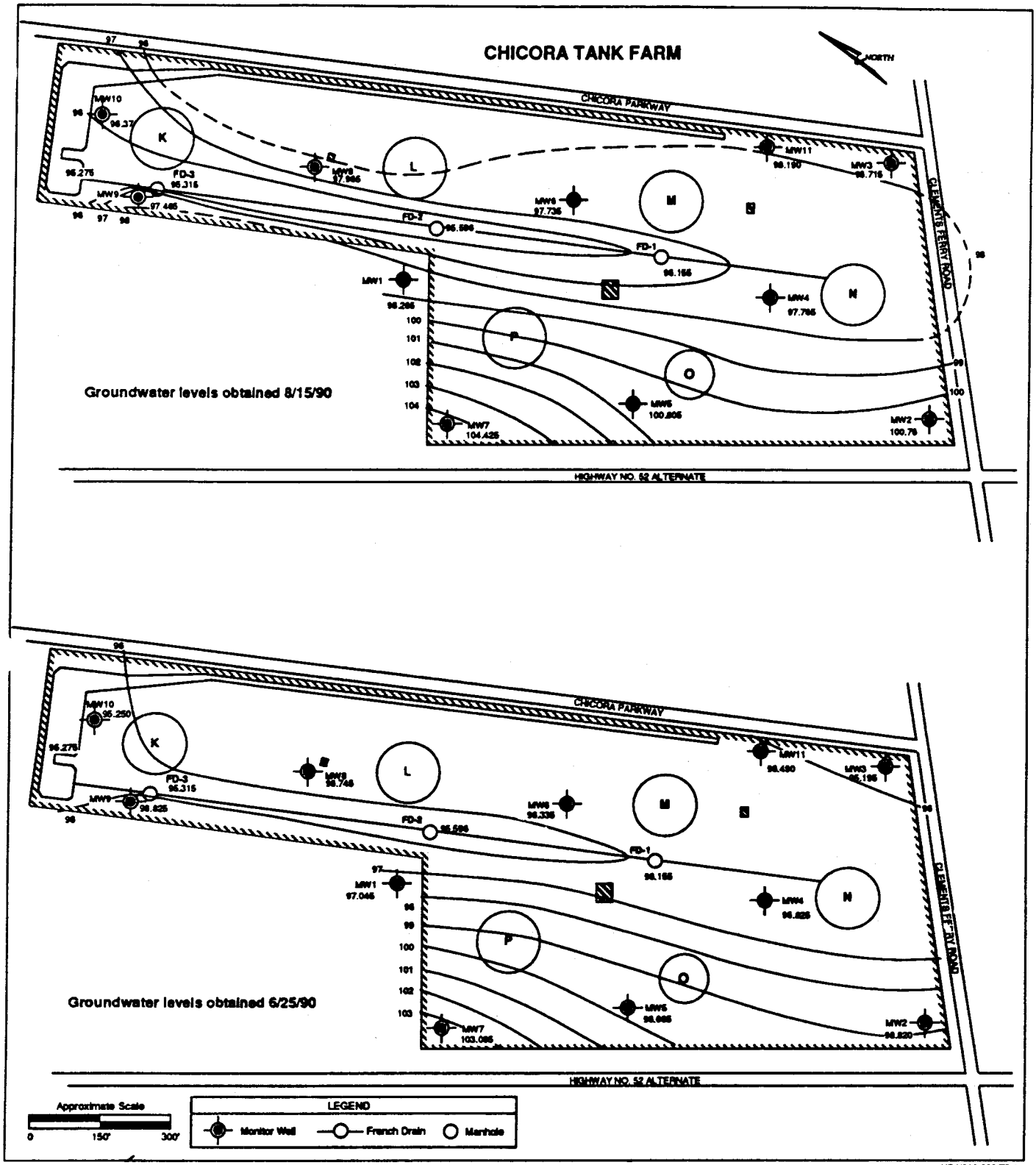


Figure 4-6. Groundwater potentiometric surface map from 1990 data.

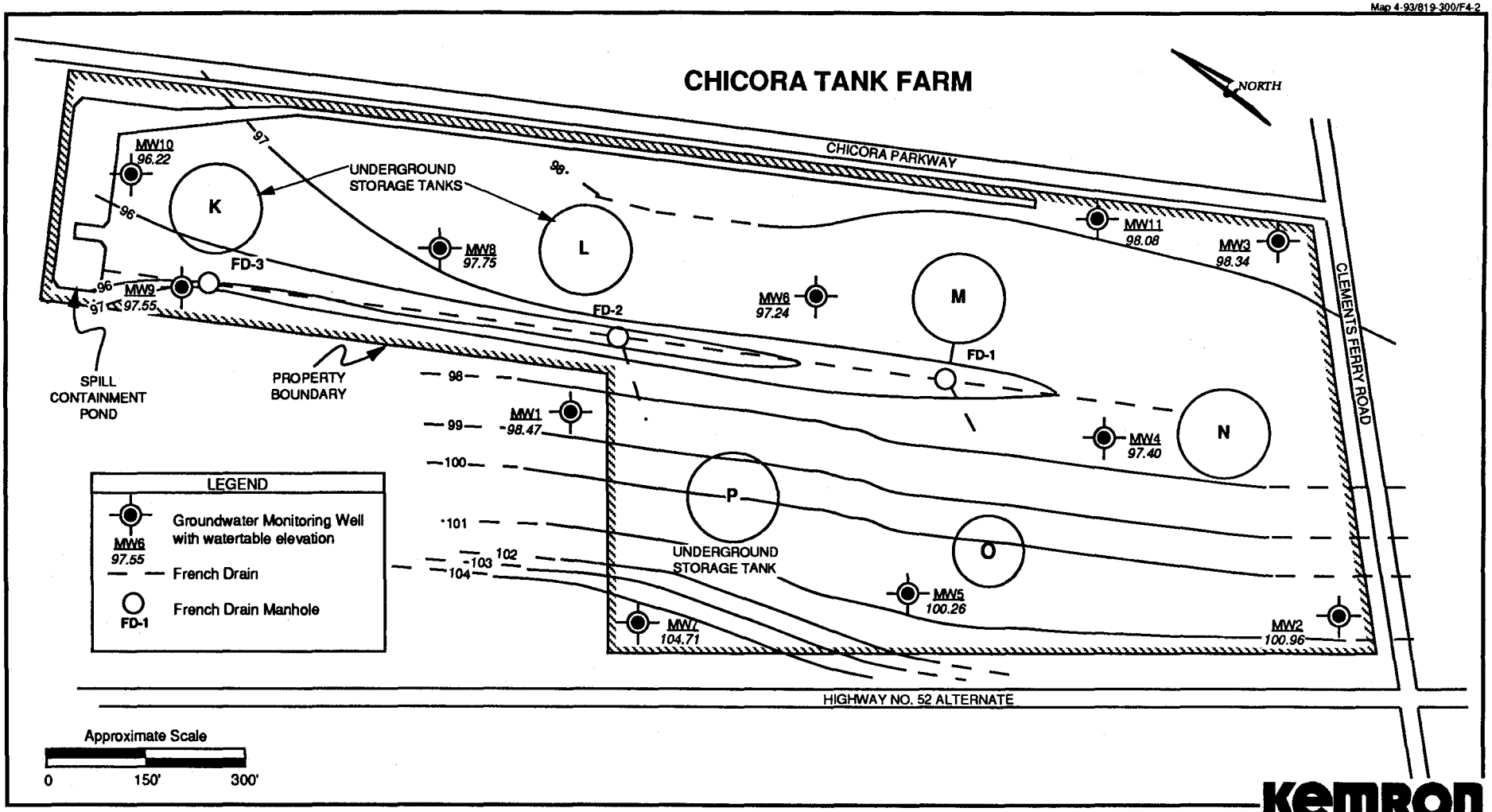


Figure 4-7. Groundwater surface potentiometric map from March 1993.

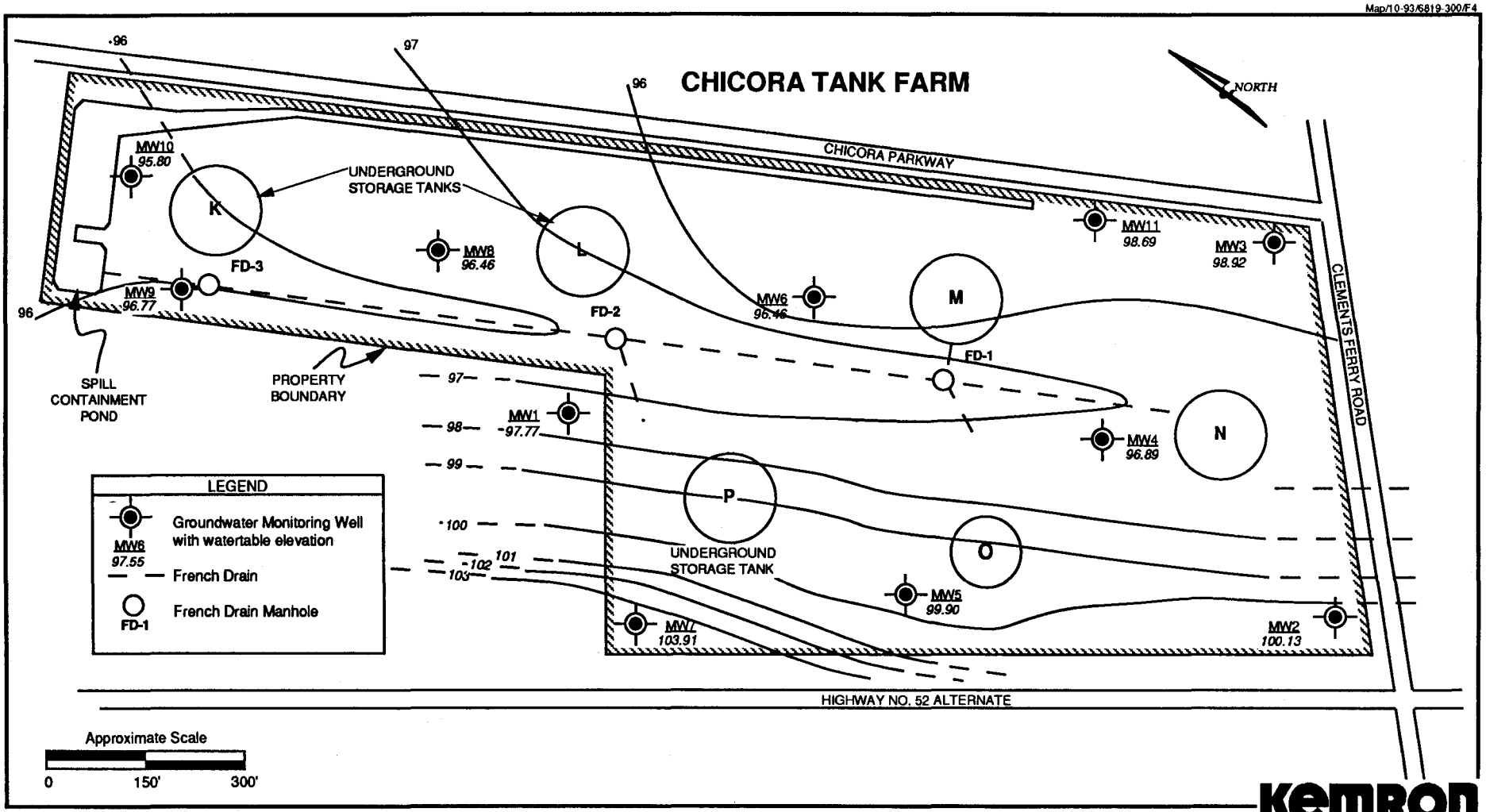


Figure 4-8. Groundwater surface potentiometric map from June 1993.

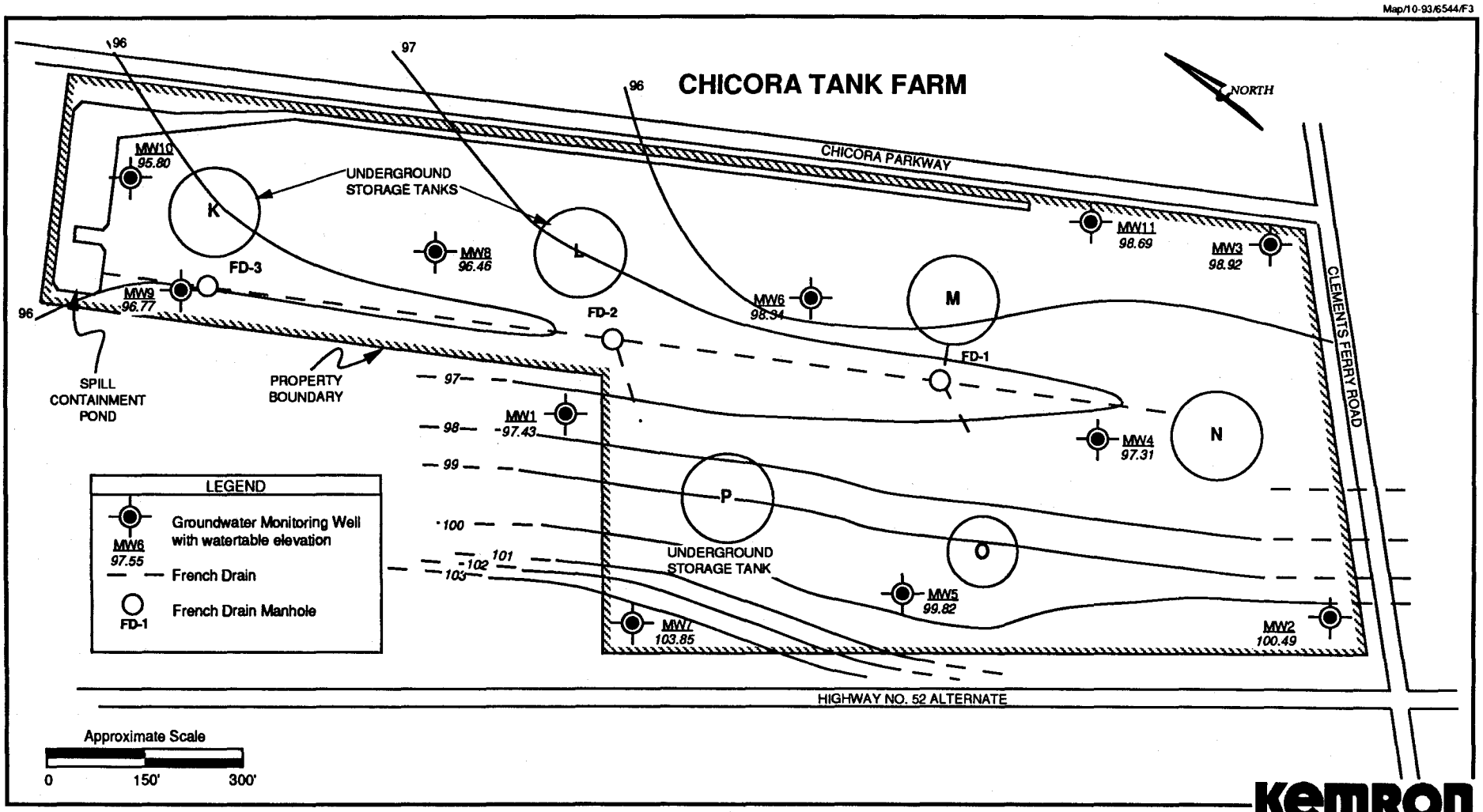


Figure 4-9. Groundwater surface potentiometric map from September 1993.

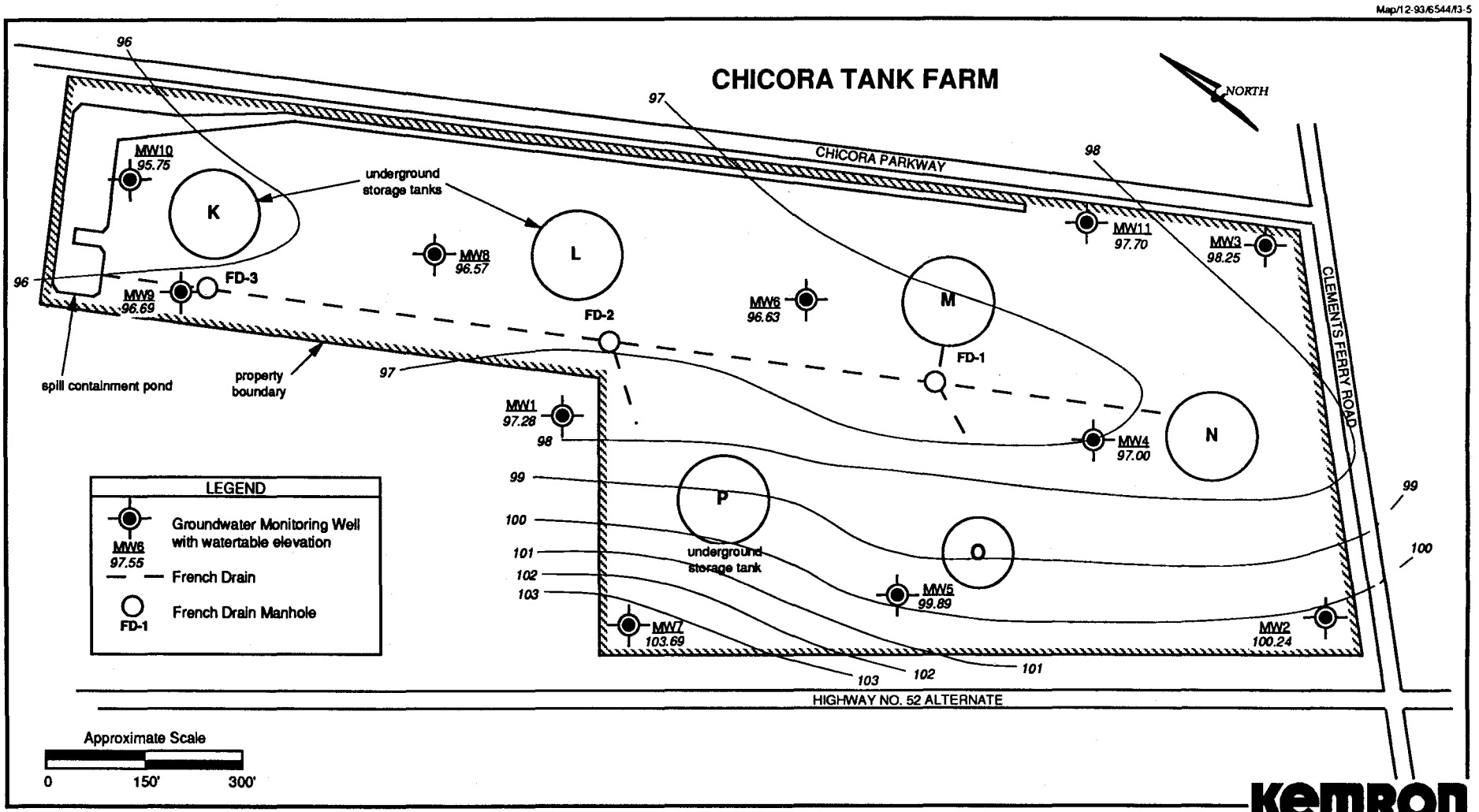


Figure 4-10. Groundwater surface potentiometric map from December 1993.

5. SOIL ASSESSMENT RESULTS

Soil sampling was conducted as part of the PCAR to determine the site-wide distribution of petroleum residues in soils. These samples were collected as described in Chapter 3. Field observations during PCAR activities suggested that sediment in the spill containment pond was contaminated with petroleum residues. To provide additional information on the nature of the contamination in the pond, sediment samples were collected as part of the IWP.

5.1 SOIL SAMPLING RESULTS FROM PRELIMINARY CONTAMINATION ASSESSMENT. Soil samples retrieved from drill rig-advanced boreholes showed little evidence of contamination. Total BTEX at a concentration of 0.062 mg/kg was found in borehole B-7 at a depth of 3.5 to 5.0 ft. below ground surface. Total PAH of 0.104 mg/kg was detected in the sample retrieved from 5.0 to 6.5 ft. below ground surface in borehole B-11. PAH and BTEX were not detected in the remaining soil samples. TPH was not detected in any soil samples.

5.2 RESULTS FROM SAMPLING AND ANALYSIS OF POND SEDIMENT. On 17 March 1993, eight sediment samples, designated as "Sed-1" through "Sed-8", were collected from the bottom of the spill containment pond at locations illustrated in Figure 5-1. A stainless steel hand auger was used to scoop the sediment sample from above the pond liner. The sediment samples were collected from the auger, containerized, labeled, and delivered to the laboratory. The samples were assayed for TPH, BTEX, and PAH, using EPA Methods 418.1, 8020, and 8100, respectively. In addition, the sediment samples were screened in the field for volatile organic compounds with a flame ionization detector (Foxboro OVA) to determine the extent of volatile organic vapors present within the sediments.

As summarized in Table 5-1, TPH was measured in sediment samples Sed-2 and Sed-7 at concentrations of 1,200 mg/kg and 610 mg/kg, respectively. The concentrations of TPH in the remaining sediment samples were below 260 mg/kg. With the exception of samples Sed-2 and Sed-9, laboratory analysis did not detect any BTEX constituents in the sediment samples. Xylene was measured at concentrations of 0.009 mg/kg and 0.007 mg/kg in samples Sed-2 and Sed-9, respectively. The only PAH compound present above method detection limits is fluorene, measured at 0.039 mg/kg in sample Sed-5. Laboratory documentation for sediment sample analytical results is presented in Appendix C.

5.3 RESULTS FROM CONFIRMATION SAMPLING AND ANALYSIS OF POND SEDIMENT. As requested by Mr. Tim Mettlin of DHEC to Mr. John Sneed of Charleston Naval Base, dated 29 July 1993, confirmation analyses were performed. One sediment sample, collected from the location that yielded the highest TPH result from the previous sediment sampling event (Sed 2, 1200 mg/kg), was submitted for Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) analysis by modified Method 8015 using extraction Methods 5030 for GRO and 3550 for DRO. These analyses were requested as confirmation analyses for the original TPH (by Method 418.1) analyses conducted to assess the pond sediment. It was noted by Mr. Mettlin that the 418.1 analysis is subject to potential false positives due to various interferences.

The sediment was resampled at the Sed-2 sampling location. Laboratory results show a GRO content of 0.18 mg/kg and DRO content of 22 mg/kg for the sample. Thus, the total TPH as measured by Method 8015 GRO/DRO is significantly less than the Method 418.1 result of 1,200 mg/kg from the same location.

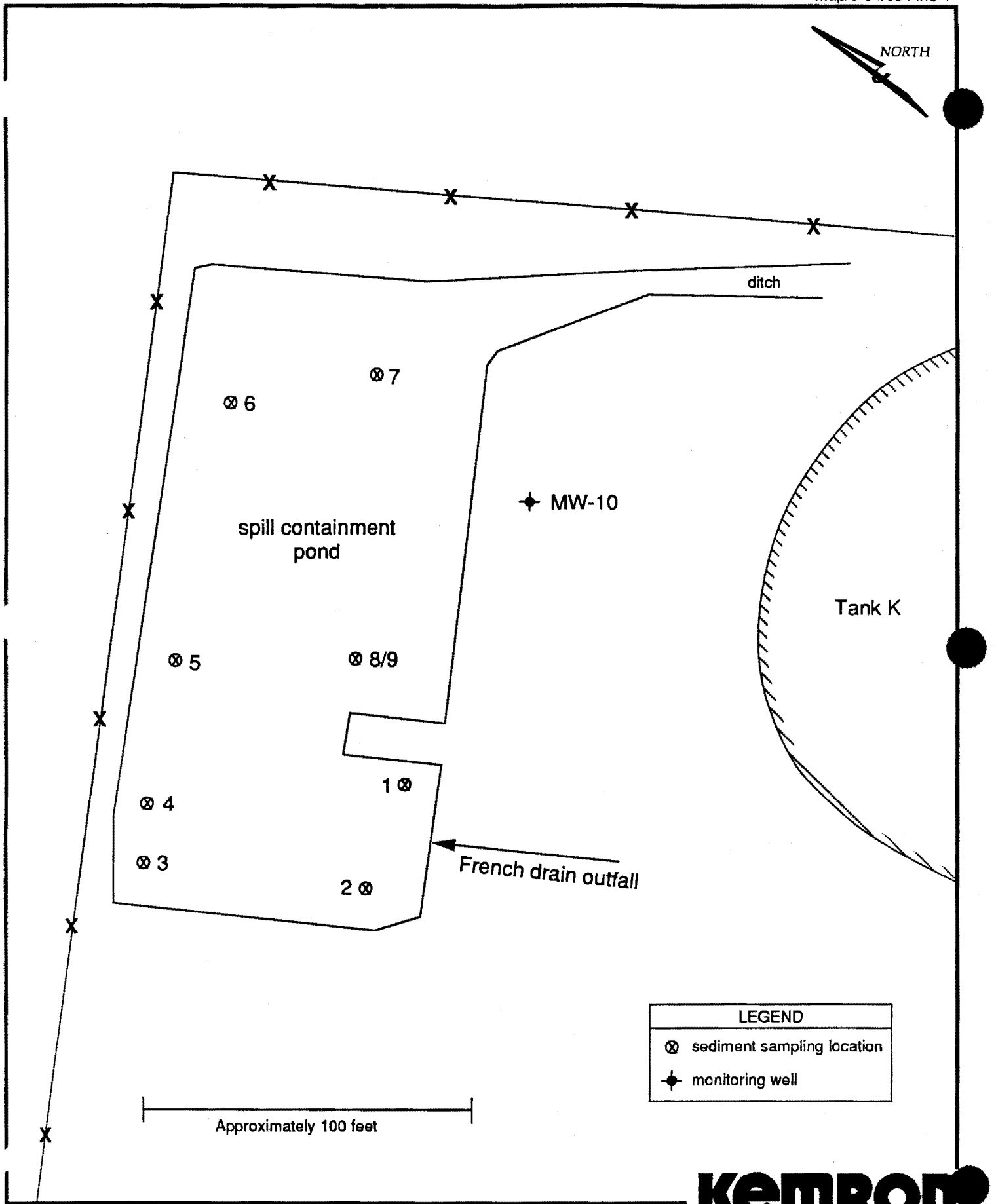


Figure 5-1. Sampling locations for spill containment pond sediment.

KEMRON ENVIRONMENTAL SERVICES

Table 5-1. Summary of Sediment Sample Analysis
Chicora Tank Farm, Charleston, South Carolina
17-Mar-93

Compound	Sed-1	Sed-2	Sed-3	Sed-4	Sed-5	Sed-6	Sed-7	Sed-8	Sed-9*
TPH	< 25	**1,200**	**260**	**140**	<25	**170**	**610**	<25	**46**
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene	<0.005	**0.009**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.007**
Naphthalene	<0.033	<0.33	<0.33	<0.33	<0.033	<0.33	<0.33	<0.033	<0.033
Acenaphthylene	<0.033	<0.33	<0.33	<0.33	<0.033	<0.33	<0.33	<0.033	<0.033
Acenaphthene	<0.033	<0.33	<0.33	<0.33	<0.033	<0.33	<0.33	<0.033	<0.033
Fluorene	<0.033	<0.33	<0.33	<0.33	**0.039**	<0.33	<0.33	<0.033	<0.033
Phenanthrene	<0.033	<0.33	<0.33	<0.33	<0.033	<0.33	<0.33	<0.033	<0.033
Anthracene	<0.033	<0.33	<0.33	<0.33	<0.033	<0.33	<0.33	<0.033	<0.033
Fluoranthene	<0.033	<0.33	<0.33	<0.33	<0.033	<0.33	<0.33	<0.033	<0.033
Pyrene	<0.033	<0.33	<0.33	<0.33	<0.033	<0.33	<0.33	<0.033	<0.033
Benzo(a) anthracene	<0.16	<1.6	<1.6	<1.6	<0.16	<1.6	<1.6	<0.16	<0.16
Chrysene	<0.16	<1.6	<1.6	<1.6	<0.16	<1.6	<1.6	<0.16	<0.16
Benzo(b) fluoranthene	<0.16	<1.6	<1.6	<1.6	<0.16	<1.6	<1.6	<0.16	<0.16
Benzo(k) fluoranthene	<0.16	<1.6	<1.6	<1.6	<0.16	<1.6	<1.6	<0.16	<0.16
Benzo(a) pyrene	<0.16	<1.6	<1.6	<1.6	<0.16	<1.6	<1.6	<0.16	<0.16
Indeno (1,2,3 -cd) pyrene	<0.16	<1.6	<1.6	<1.6	<0.16	<1.6	<1.6	<0.16	<0.16
Dibenzo (a,h) anthracene	<0.16	<1.6	<1.6	<1.6	<0.16	<1.6	<1.6	<0.16	<0.16
Benzo (g,h,i) perylene	<0.16	<1.6	<1.6	<1.6	<0.16	<1.6	<1.6	<0.16	<0.16

All measurements in parts per million (mg/kg)

* Sed-8 Duplicate

6. SUMMARY AND CONCLUSIONS

6.1 NATURE AND EXTENT OF CONTAMINATION.

6.1.1 Composition. Tanks K, L, and P were historically used to store DFM. Seepage of fuel through the tank walls and into the pump rooms of these tanks has been observed since shortly after Navy Distillate replaced NSFO in the tanks in 1969. Laboratory analysis of free product samples retrieved from the french drain system in 1988 found a combination of DFM and NSFO. Leakage from one or all of these three tanks was thought to be the source of fuel oil discovered in the french drain system.

Results of the library search to identify non-target analytes in water samples show that sample FD-3 contains a number of compounds that are hydrocarbons or compounds resembling hydrocarbons. The sample data are consistent with the presence of a refined petroleum product(s) containing high molecular weight hydrocarbons. Such products would be commonly used commercially as lubricating oils, greases, and heavy, partially refined fuel oils such as NSFO and DFM.

6.1.2 Sources. The tracer survey, soil-gas survey, and soil sampling and analysis performed during this investigation detected only weak indications of petroleum leakage from the tanks or the associated piping. No free-phase petroleum or petroleum sheen was detected in the french drain manhole FD-1. A petroleum sheen was detected in french drain manhole FD-2. Free-phase product detected in french drain manhole FD-3 was removed during the first quarterly sampling event, and has yet to recharge.

The possible sources of the contamination present within manholes FD-2 and FD-3 include previous spills, illegal dumping into the drainage system, tank leaks, or leaking piping. The source of the petroleum sheen observed in manhole FD-2 is likely to be the fuel release on the eastern slope of tank P. In 1990, the petroleum sheen in manhole FD-2 was observed to be flowing from the french drain lateral from tank P. The free-phase petroleum observed in manhole FD-3 is possibly due to the above-mentioned tank P fuel release or may be due to illegal dumping into the drainage system. Speculation regarding the latter was noted during interviews with NSC personnel but appeared to be based only on the fact that fuel is observable in FD-3. The presence of grass and debris observed in manhole FD-3 and not observed in either of the other french drain manholes suggests dumping.

As discussed in Chapter 2, during a contamination assessment of the tank farm completed by ESE in 1986, nine soil samples were retrieved from borings installed around tanks K, L, and P. TPH and BTX assays performed on these samples failed to detect any evidence of petroleum contamination.

6.1.3 Extent in Groundwater. During the 1986 investigation, ESE collected groundwater samples from nine soil borings. Each water sample was examined for signs of petroleum contamination. The water sample retrieved from ESE borehole 3B, located northwest of tank K reportedly exhibited a petroleum sheen. None of the groundwater samples were reported to have exhibited a petroleum odor.

Analytical data from analysis of groundwater samples collected during the baseline sampling event and the quarterly sampling events shows that, for the most part, BTEX and PAH constituents are not present above method detection limits. TPH analyses from the PCAR activities show that measurable levels of TPH by Method 418.1 are not present in samples collected from groundwater monitoring wells. However, detectable levels were present in FD-3. This may be due to the presence of free-phase petroleum in the manhole during sampling. This petroleum was subsequently removed and has

not recharged, suggesting that there is no constant source of input, e.g., a free-phase petroleum plume on the water table. The only BTEX detections included detection of low level xylenes in MW-4 in the first quarter, but none were detected in the second, third, or fourth quarters.

As discussed in the second quarterly monitoring report, elevated detection limits from interferences on sample FD-3 prompted close examination of the Method 8100 chromatogram, which shows the presence of petroleum compounds in the sample. Inspection of the third quarter set of chromatograms from the Method 8100 analyses of samples collected from french drain manholes also show that petroleum constituents are present and the hydrocarbon spectra resemble heavy fraction petroleum hydrocarbons. This observation was substantiated by semivolatiles analyses of selected groundwater samples which qualitatively identified low level parts per billion, heavy petroleum distillate compounds.

6.1.4 Extent in Soils. Significant levels of BTEX, PAH, or TPH appear to be limited to sediments of the spill containment pond, where TPH values range up to 1,200 mg/kg.

6.2 CONCLUSIONS. The tracer survey, soil-gas survey, soil sample analyses, and groundwater sample analyses may be interpreted to indicate the following:

- no significant leaks from the tanks and pipelines are present at the site, although traces of petroleum contamination exist in soils and groundwater, with the exception of manhole FD-3 and the spill containment pond,
- low-level petroleum contamination is present in the groundwater near tank P,
- the petroleum film and minor contaminant detections are likely the result of the reported fuel overtopping, and
- petroleum contamination is confined to the french drain system and most notably manhole FD-3.

As presented in the PCAR/CAP, oil was observed on the walls of the pump rooms during the preliminary assessment activities, suggesting that sufficient porosity exists in the tank walls, where they are exposed in the pump rooms, to allow passage of petroleum into the pump rooms. Oil was not observed elsewhere adjacent to the tanks.

It appears that low-level petroleum and petroleum constituent contamination exists at the site due to historic releases. The most significant residues remaining are in the vicinity of tank P which was overtopped in approximately 1986. Substantial contamination is limited to manhole FD-3 and in sediments of the spill containment pond.

6.3 RECOMMENDATIONS. Because the storage tanks are no longer in use at the CTF and baseline and quarterly groundwater monitoring events have documented the presence of such small quantities of petroleum residues in groundwater, a "no further action" status is recommended with respect to groundwater at the site.

Similarly, substantial quantities of petroleum residues are present in only limited areas of the site, namely, in pond sediments. Thus, a "no further action" status is recommended for petroleum residues in site soils at this time. It is possible that some limited areas of contamination, primarily in the vicinity of the pump rooms, may be found during closure of the storage tanks, which will be

conducted as part of the base closure. Remediation of pond sediments, if required, may be conducted in conjunction with cleaning and permanent closure of the tanks.

APPENDIX A
Soil Boring Logs and Monitoring Well Construction Diagrams

BORING LOGS

Conducted by: KEMRON Environmental Services Date: 19-21 June 1990

Boring No.	Depth (ft)	Description
B-1	0 - 4	Sand (fill), fine to medium grain, red to tan, no petroleum odor.
	4 - 7	Sand (fill), fine grain, tan, no petroleum odor.
	7 - 13	Silty sand, fine grain, tan to light gray, wet, no petroleum odor.
	13 - 17	Sand, fine grain, dark gray to black, wet, no petroleum odor.
B-2	0 - 5	Clayey sand, fine grain, dark brown, no petroleum odor.
	5 - 13	Clayey sand, fine grain, gray to light tan, iron staining, wet below 9 feet, no petroleum odor.
	13 - 16	Clayey sand, fine grain, dark gray to black, shell fragments, wet, no petroleum odor.
B-3	0 - 5	Sand, fine grain, tan, no petroleum odor.
	5 - 8	Sandy clay, fine grain, light gray, iron staining, no petroleum odor.
	8 - 12	Sand, fine grain, light gray to tan, wet, no petroleum odor.
	12 - 16	Clayey sand, fine grain, dark gray, high shell content, wet, no petroleum odor.

BORING LOGS (continued)

Conducted by: KEMRON Environmental Services Date: 19-21 June 1990

Boring No.	Depth (ft)	Description
B-4	0 - 3	Sand, fine grain, brown, high shell content, no petroleum odor.
	3 - 9	Clayey sand, fine grain, light gray, wet below 7 feet, no petroleum odor.
	9 - 14	Clayey sand, fine grain, tan to red, wet, no petroleum odor.
	14 - 16	Clayey sand, fine grain, dark gray, wet, no petroleum odor.
	16 - 17	Clay, dark gray, wet, no petroleum odor.
B-5	0 - 2	Sandy clay, medium to dark brown, no petroleum odor.
	2 - 5	Sand, fine grain, light brown, no petroleum odor.
	5 - 7	Sand, fine grain, light gray, wet, no petroleum odor.
	7 - 11	Clayey sand, fine grain, gray, wet, no petroleum odor.
	11 - 16	Clayey sand, fine grain, dark gray, shell fragments, wet, no petroleum odor.
B-6	0 - 5	Sand, fine grain, tan, no petroleum odor.
	5 - 10	Sandy clay, fine grain, gray, wet, no petroleum odor.
	10 - 12	Sand, fine grain, gray, wet, no petroleum odor.
	12 - 16	Clay, gray, shell fragments, wet, no petroleum odor.

BORING LOGS (continued)

Conducted by: KEMRON Environmental Services Date: 19-21 June 1990

Boring No.	Depth (ft)	Description
B-7	0 - 7	Sand, fine grain, tan to dark brown, no petroleum odor.
	7 - 11	Clayey sand, fine grain, medium to dark gray, wet, no petroleum odor.
	11 - 16	Clayey sand, fine grain, dark gray, high shell content, wet, no petroleum odor.
B-8	0 - 10	Sand, fine grain, tan, iron staining, no petroleum odor.
	10 - 15	Sand, fine grain, tan to black, wet, no petroleum odor.
B-9	0 - 7	Sand (fill), fine grain, tan to brown, no petroleum odor.
	7 - 12	Sand (fill), fine grain, light gray, wet, no petroleum odor.
	12 - 16	Clayey sand, fine grain, tan to red, iron staining, wet, no petroleum odor.
B-10	0 - 2	Sand (fill), fine grain, light brown, no petroleum odor.
	2 - 5	Clayey sand, fine grain, dark brown, no petroleum odor.
	5 - 8	Sand, fine grain, tan to dark brown, iron staining, no petroleum odor.
	8 - 12	Clayey sand, fine grain, light gray, iron staining, wet, no petroleum odor.
	12 - 16	Sandy clay, dark gray, wet, no petroleum odor.

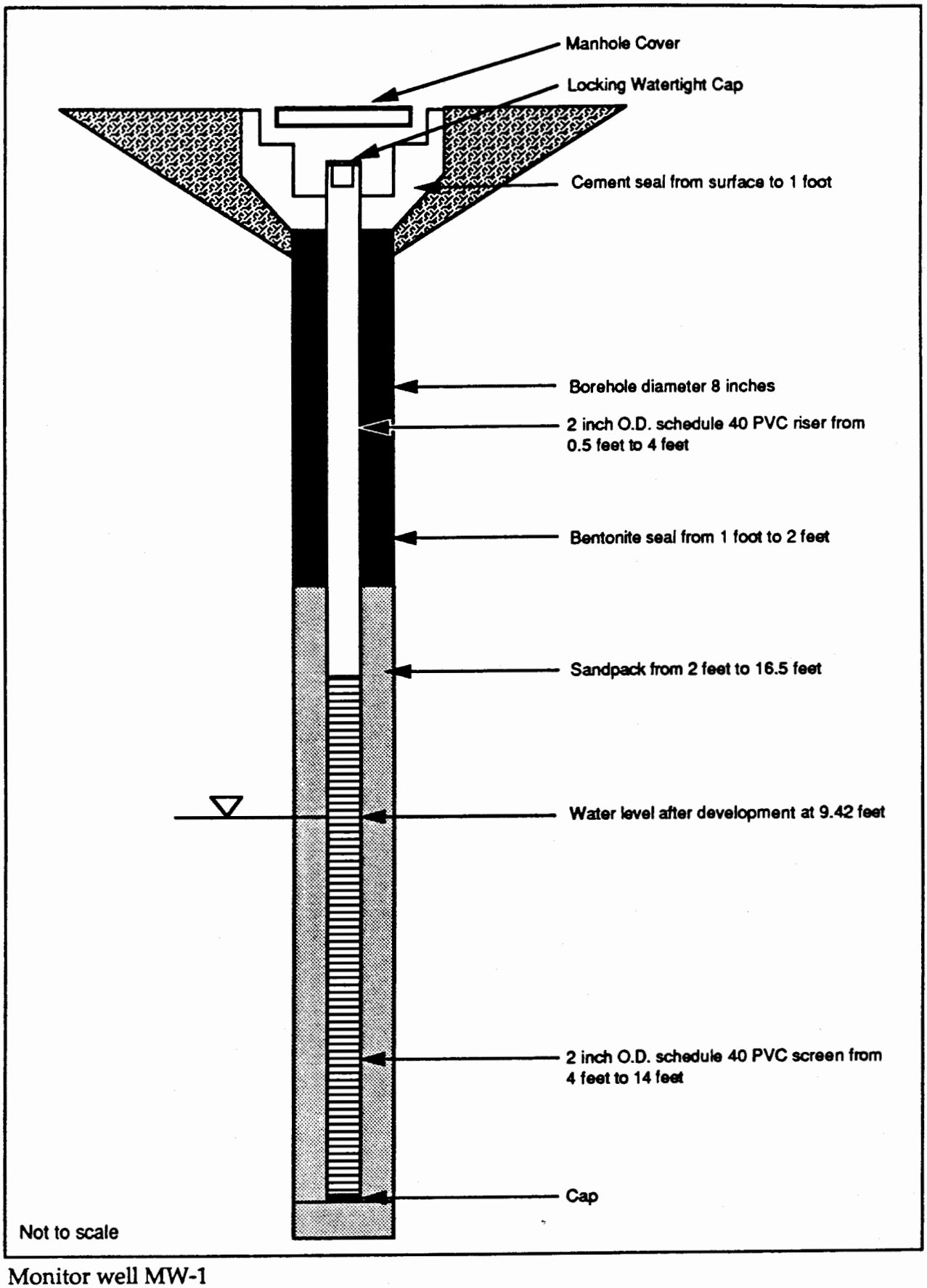
BORING LOGS (continued)

Conducted by: KEMRON Environmental Services Date: 19-21 June 1990

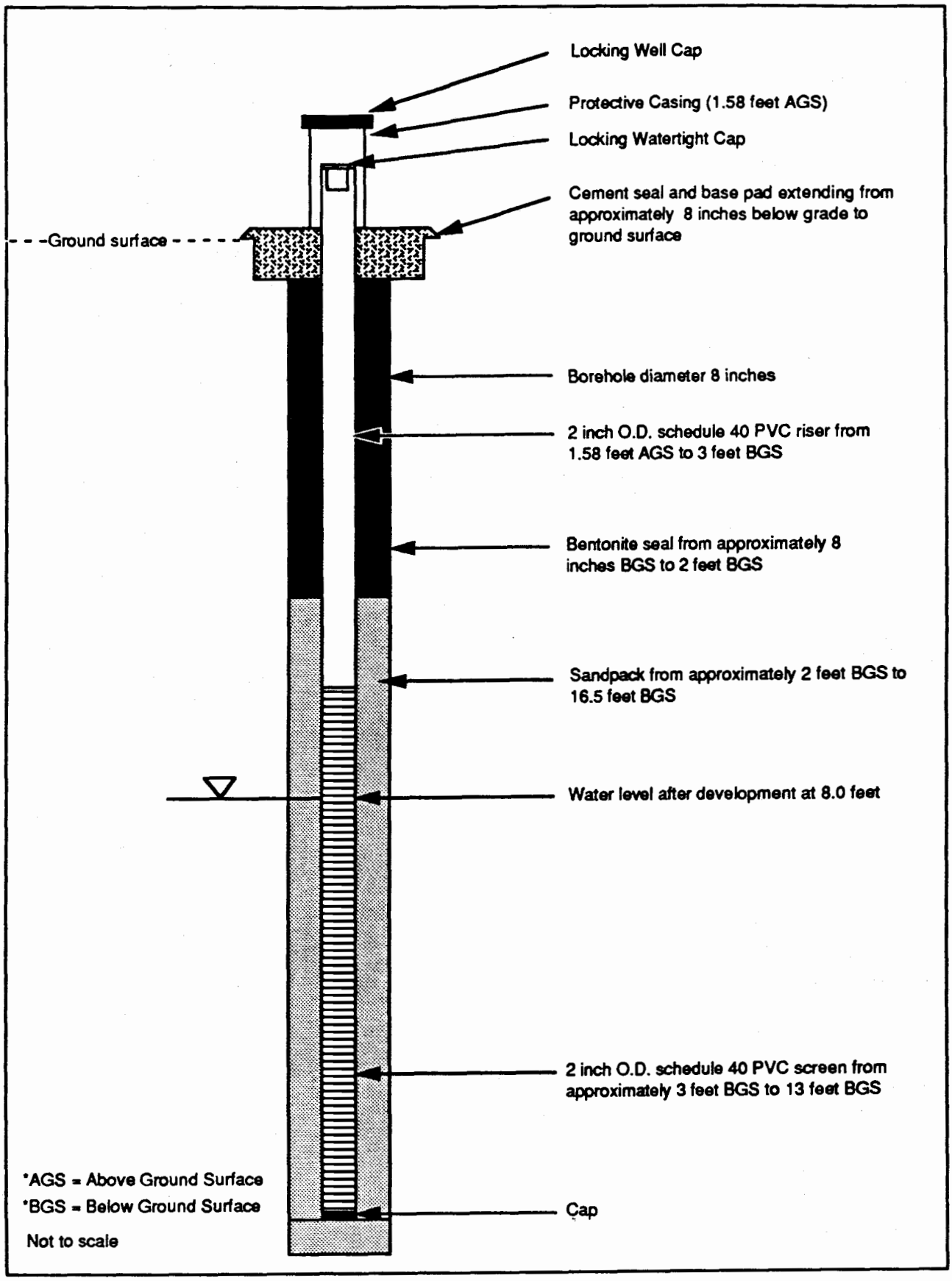
Boring No.	Depth (ft)	Description
B-11	0 - 6	Sand, fine grain, dark brown, no petroleum odor.
	6 - 9	Sand, fine grain, light gray, wet, no petroleum odor.
	9 - 17	Sandy clay, dark gray, wet, no petroleum odor.

APPENDIX B

MONITORING WELL CONSTRUCTION DIAGRAMS

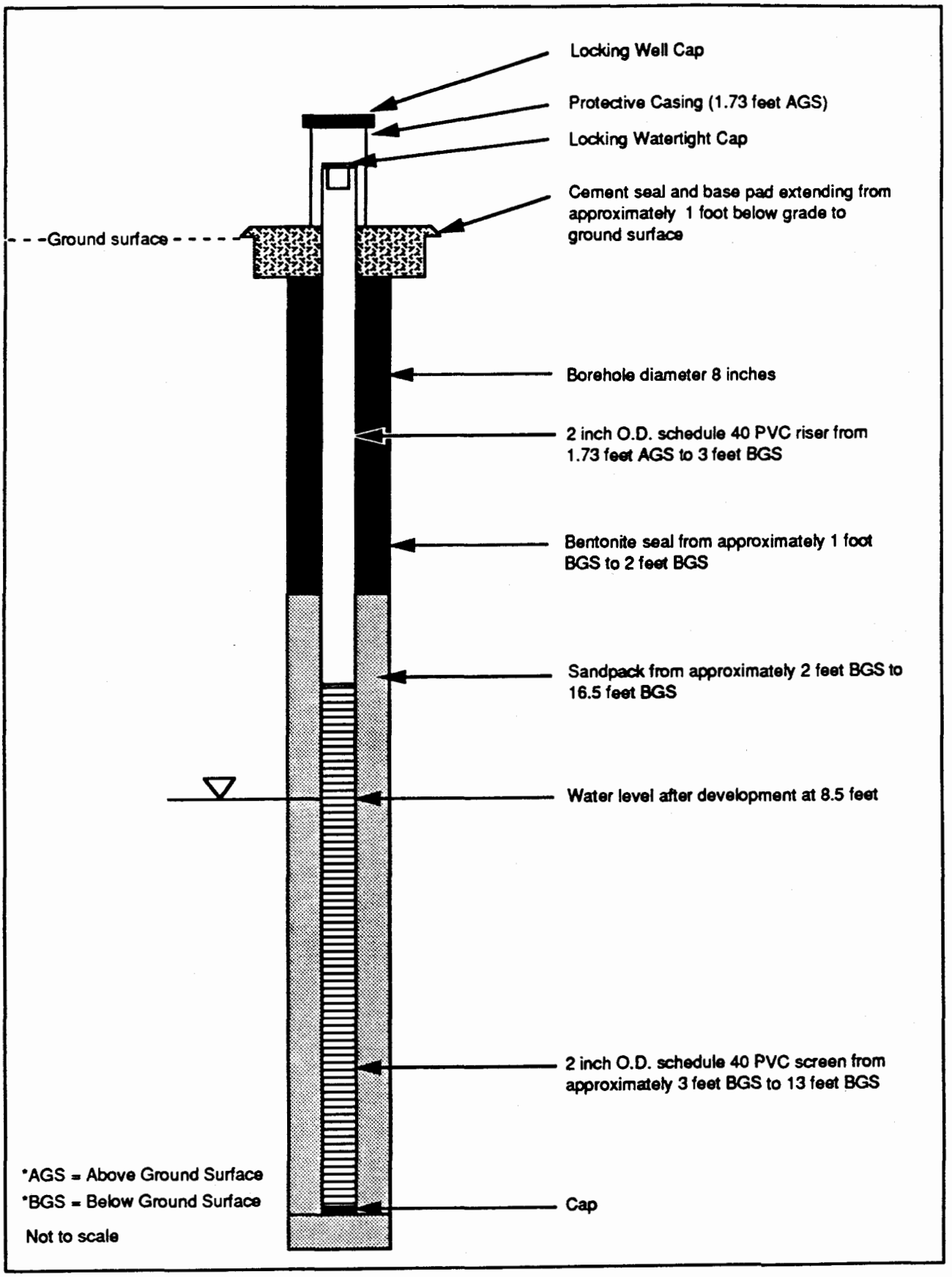


Monitor well MW-1



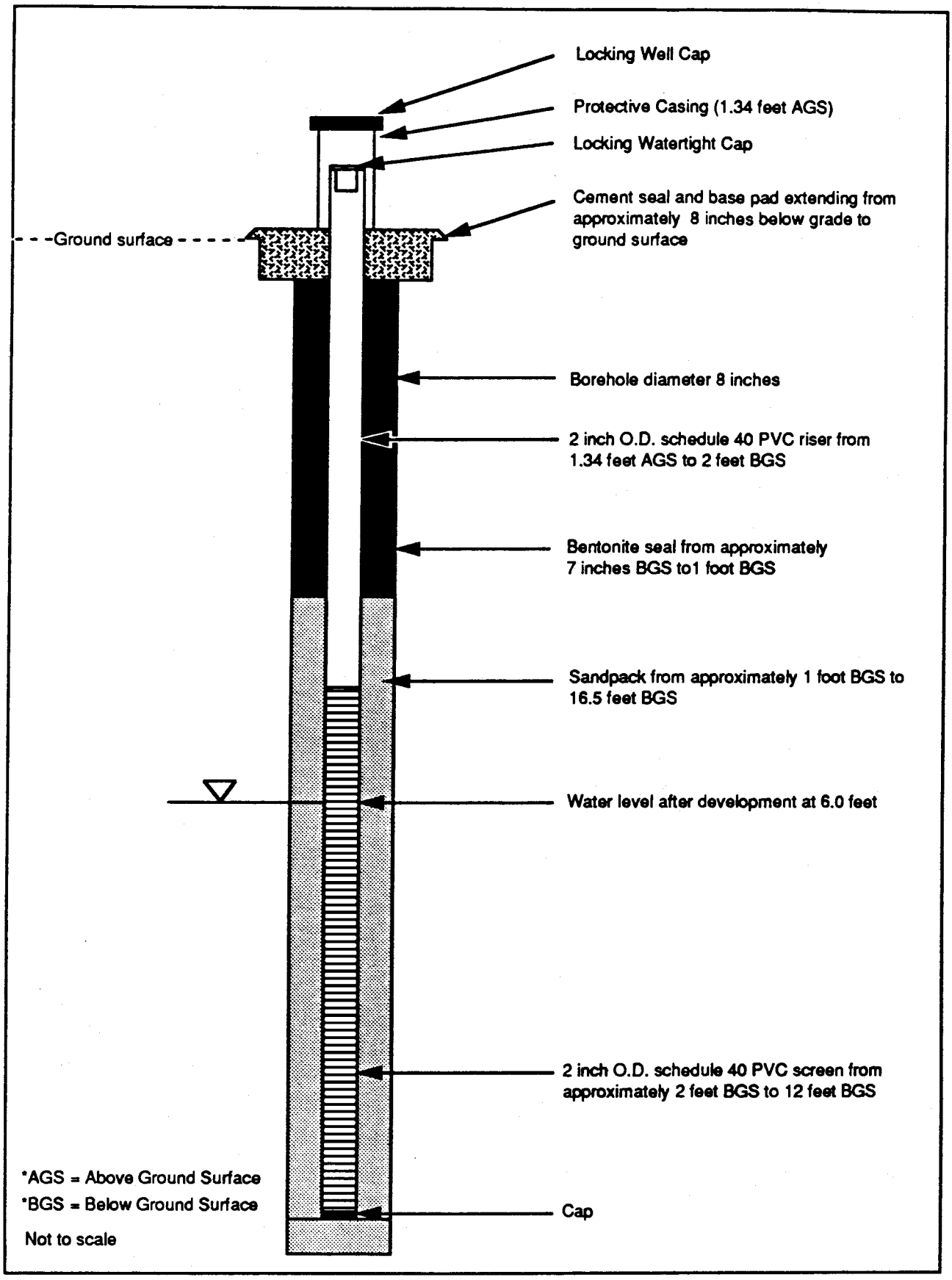
Monitoring well MW-2

ND4/819-300/2



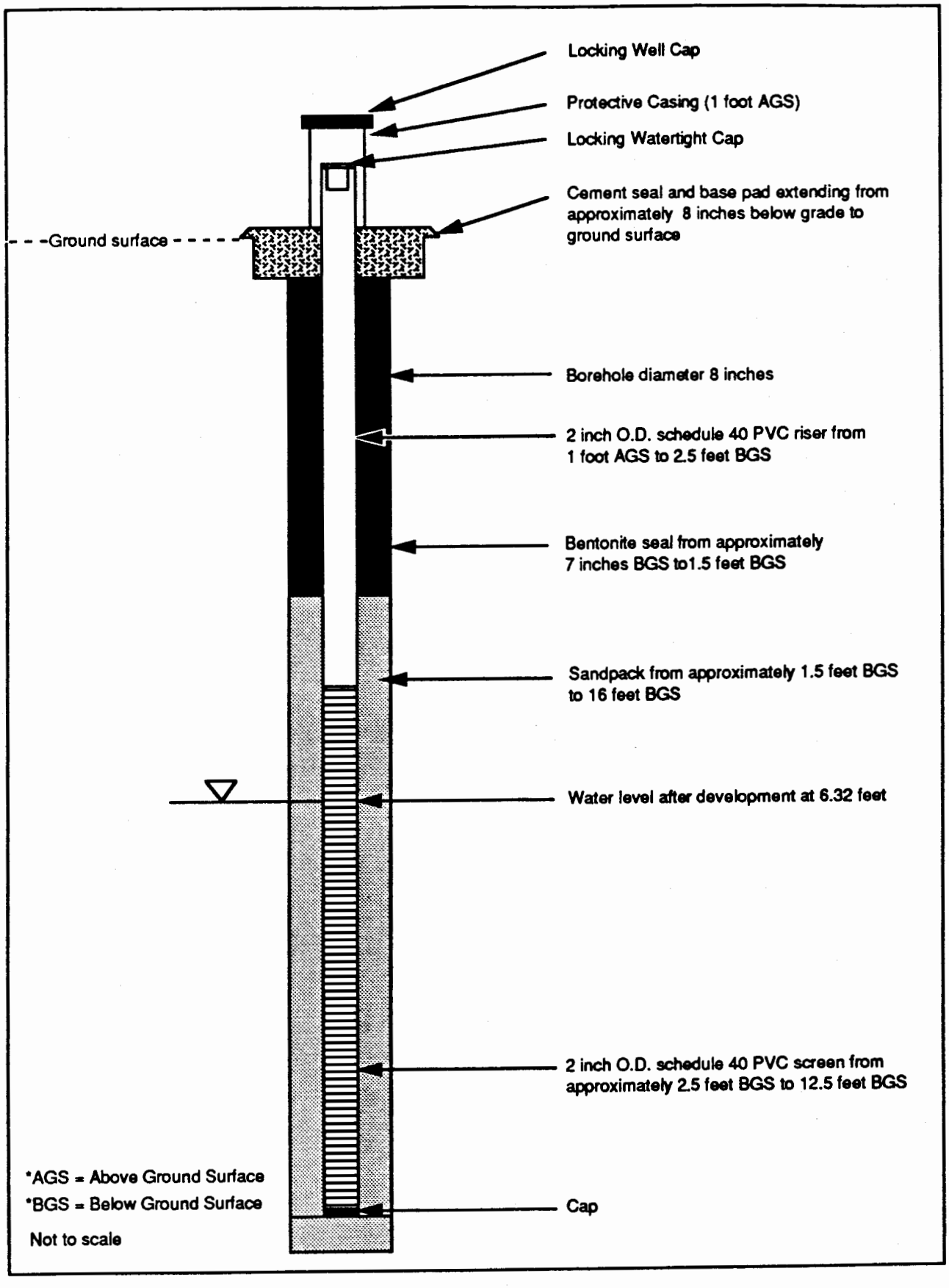
Monitoring well MW-3

ND4/819-300/3



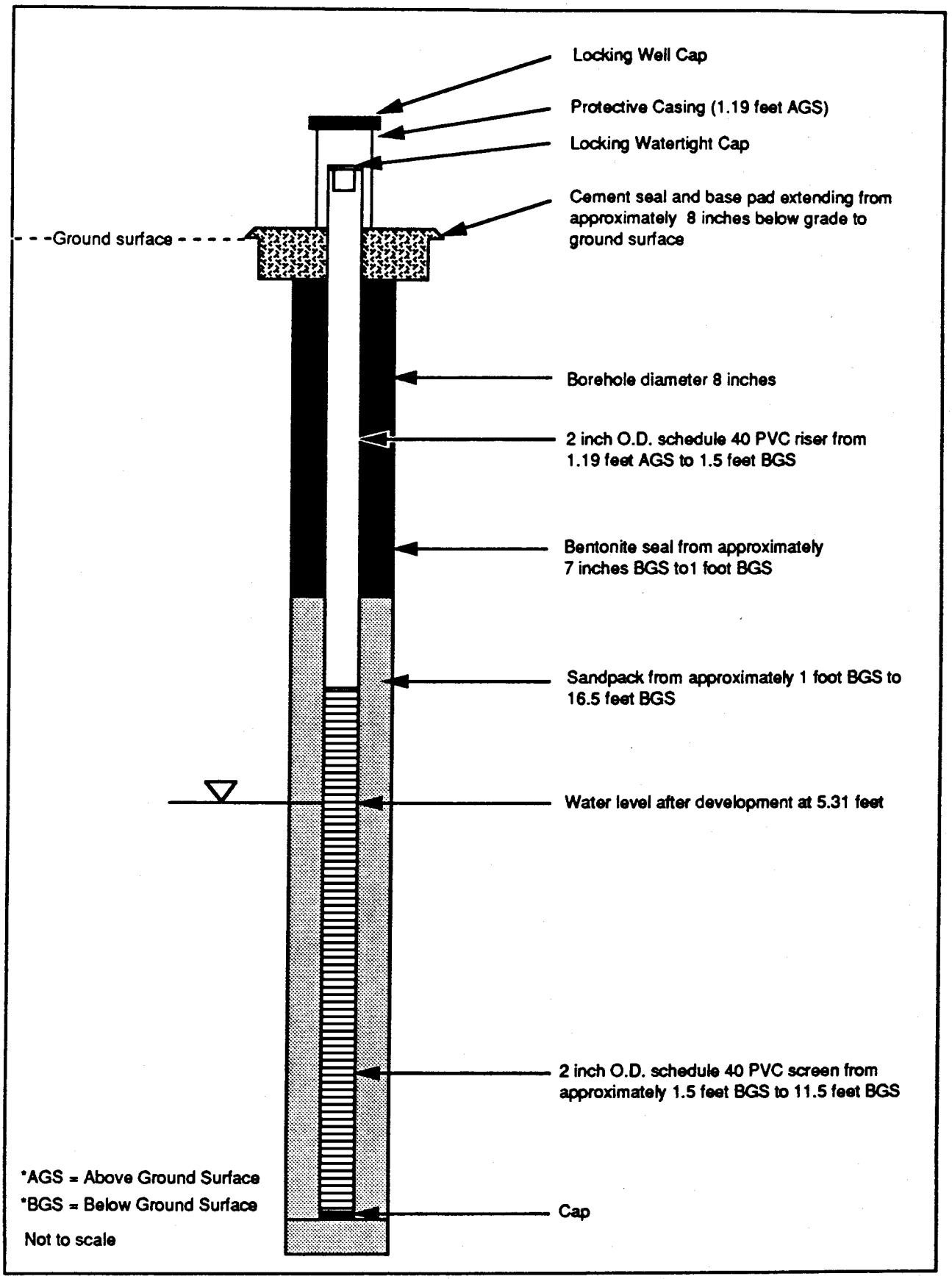
Monitoring well MW-4

ND4/819-300/4



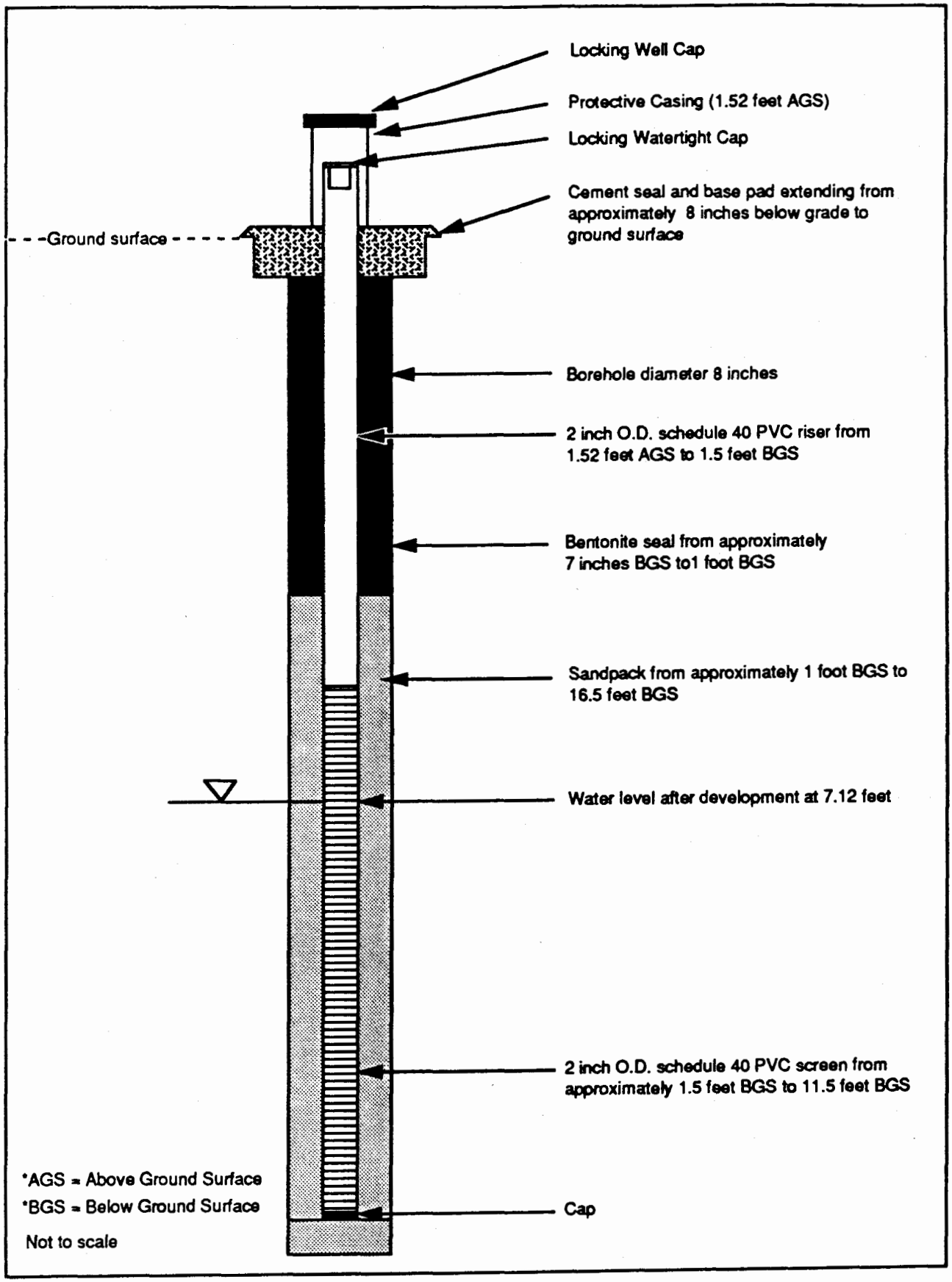
Monitoring well MW-5

ND4/819-300/5



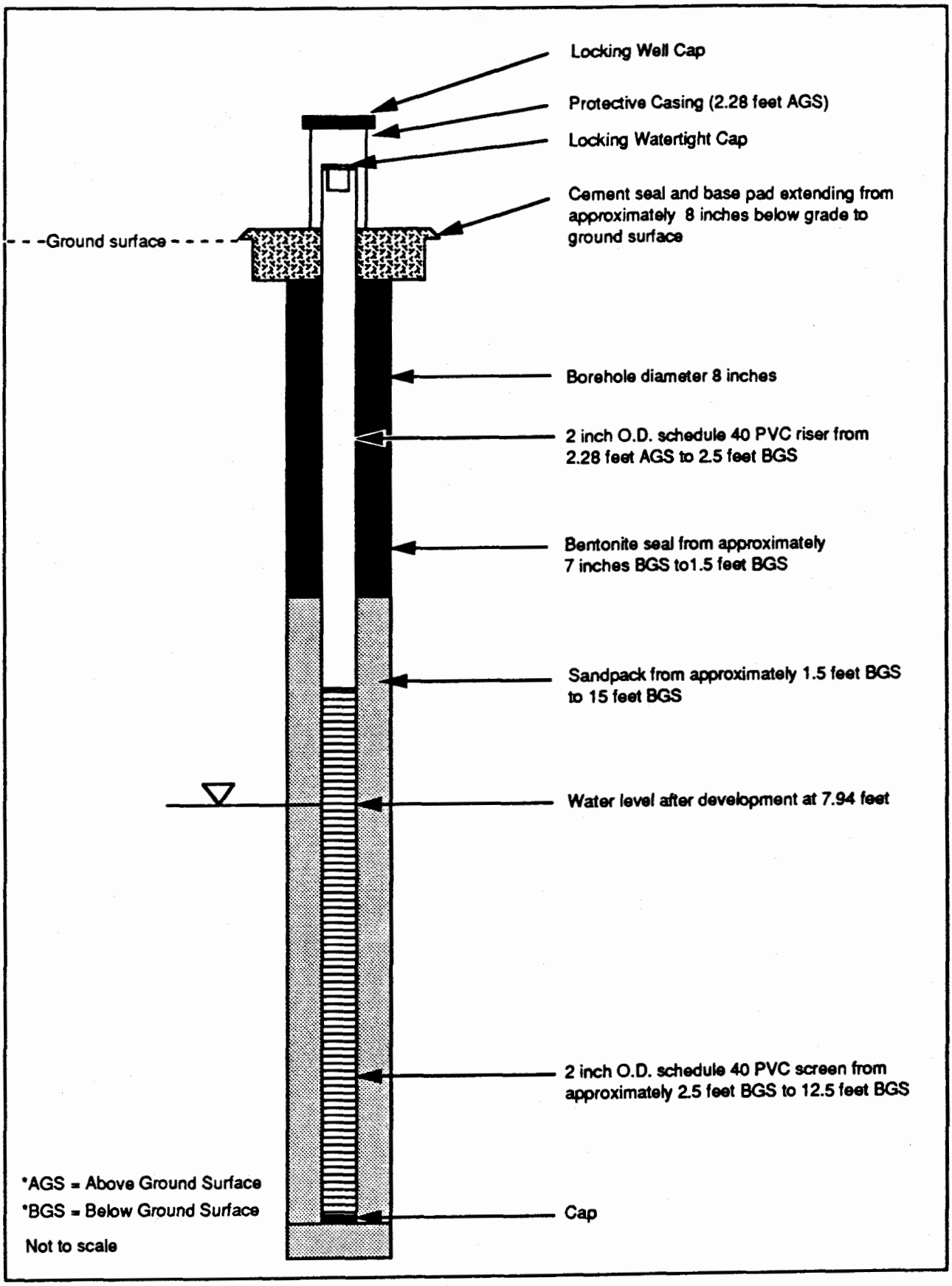
Monitoring well MW-6

ND4/819-300/6



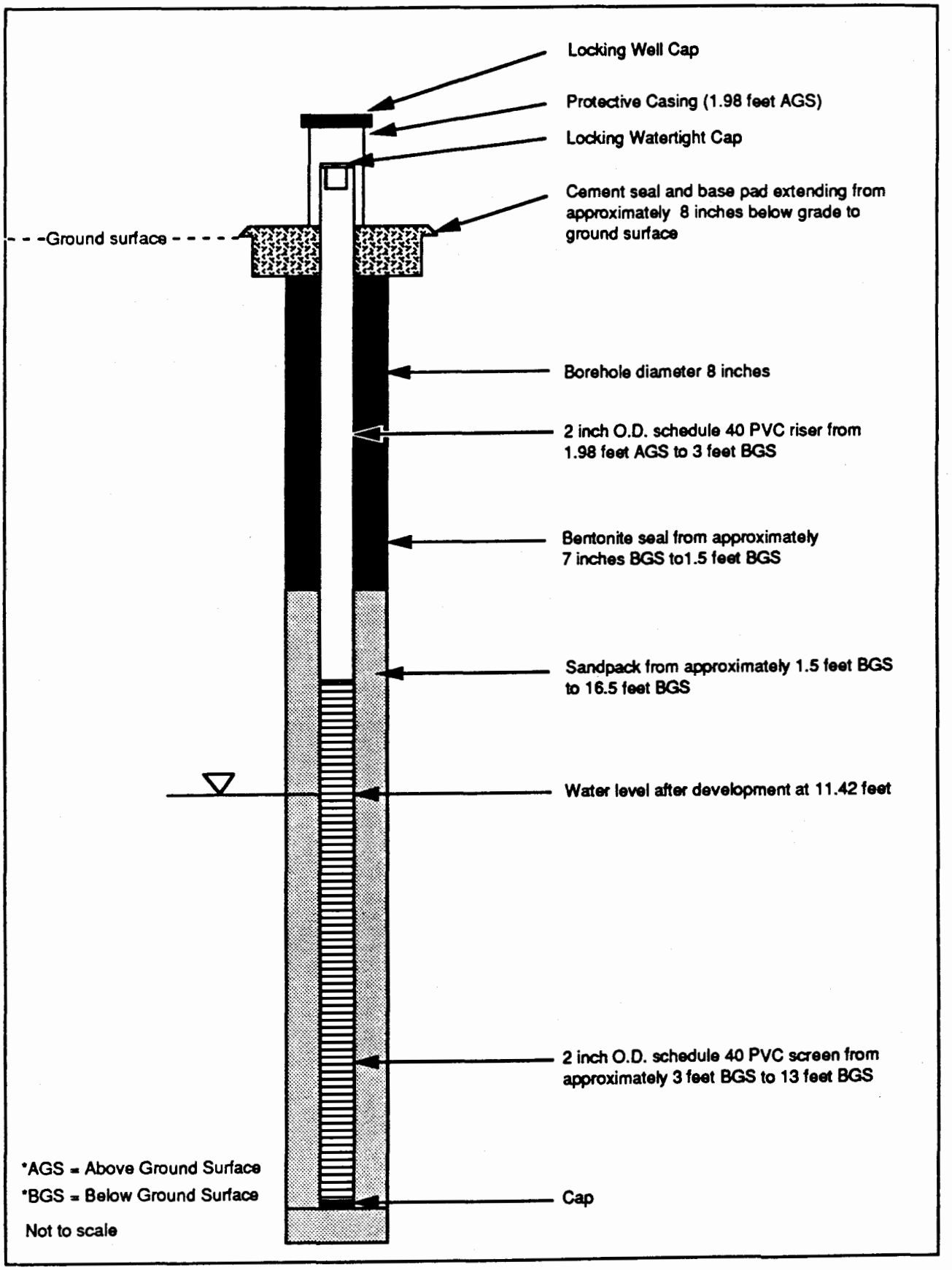
Monitoring well MW-7

ND4/819-300/7



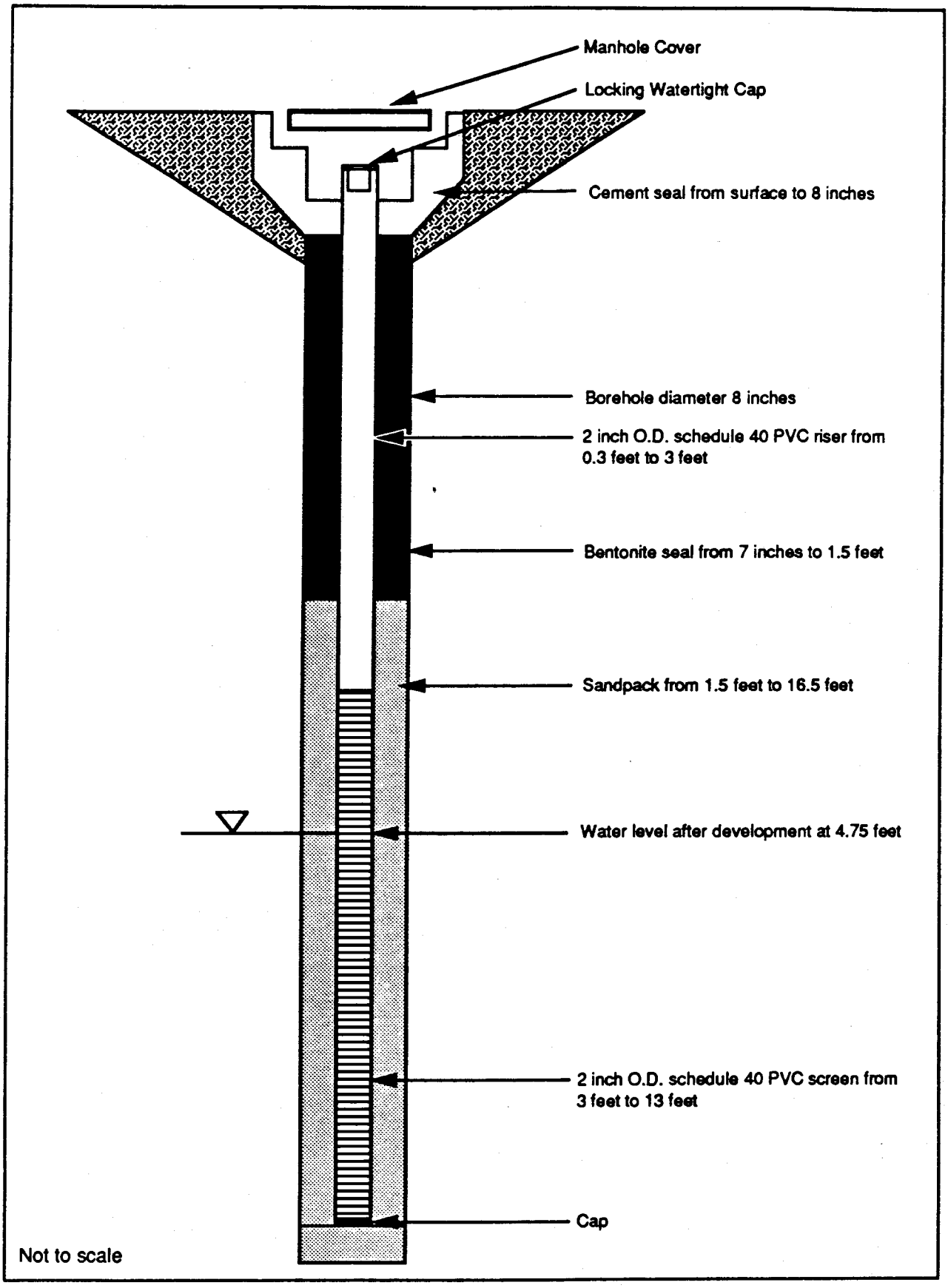
Monitoring well MW-8

ND4/819-300/8

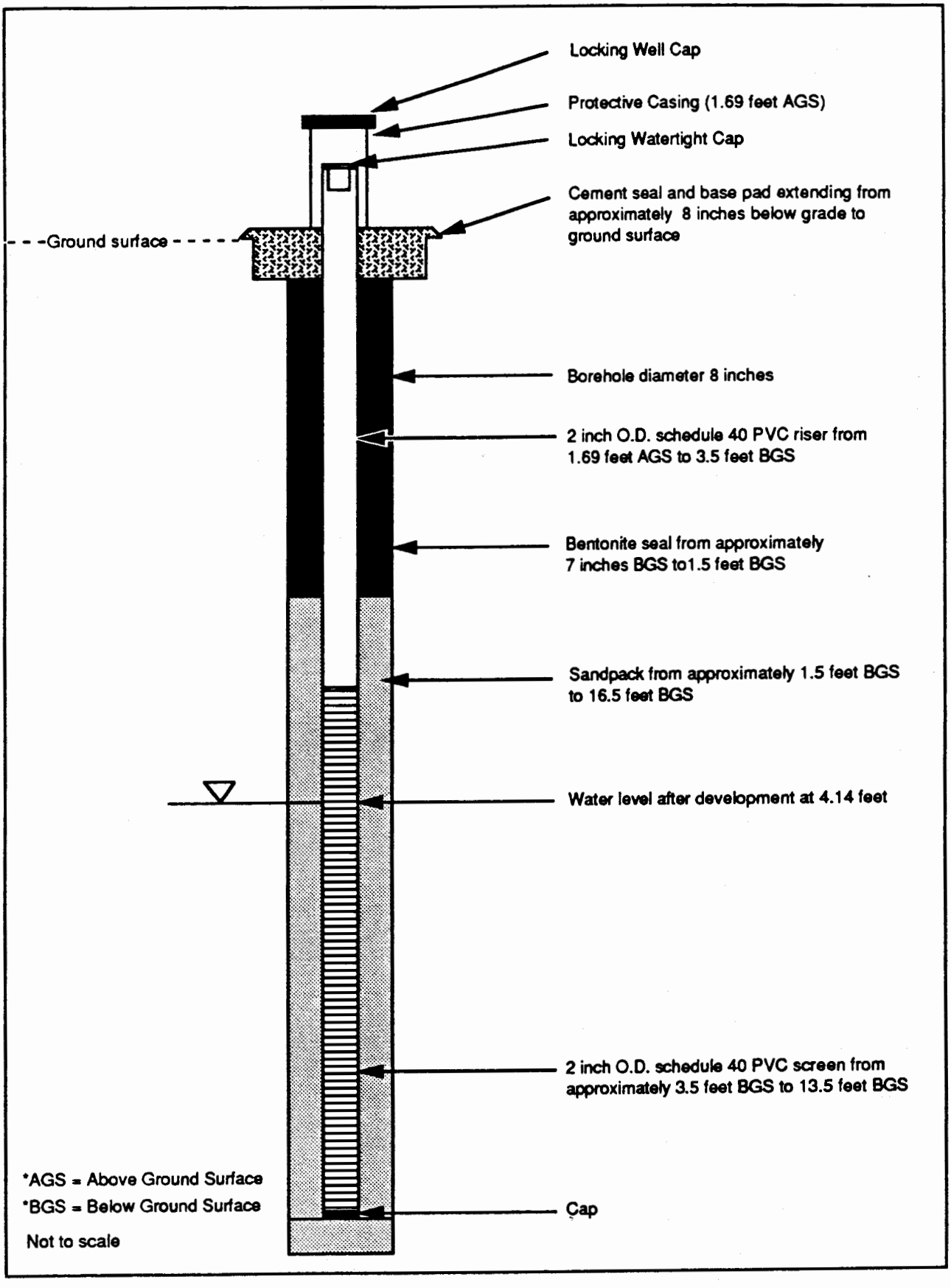


Monitoring well MW-9

ND4/819-300/9



Monitor well MW-10



Monitoring well MW-11

ND4/819-300/11

APPENDIX B
Sample Laboratory Results from 1990 Assessment

Received: 06/23/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-338

SAMPLE ID B7/10-11.5

FRACTION 02A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/20/90 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 07/01/90 FILE #: 0701A04A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

Received: 06/23/90
Results by Sample

SAMPLE ID B7/10-11.5 FRACTION 02B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/20/90 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_10
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

KEMRON REPORT
Results by Sample

Work Order # NO-06-338

SAMPLE ID B8/3.5-5

SAMPLE # 03 FRACTIONS: A,B
Date & Time Collected 06/20/90 16:10:00 Category SOIL

PCT_S	82	TPH_S	<25
	% wt.		mg/kg

Received: 06/23/90

KEMRON REPORT Work Order # N0-06-338
Results by Sample

SAMPLE ID B8/3.5-5 FRACTION 03A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/20/90 16:10:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 07/03/90 FILE #: 0702A04A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT Work Order # N0-0[illegible]-338
Results by Sample

SAMPLE ID B8/3.5-5 FRACTION 03B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/20/90 16:10:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_11
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

Received: 06/23/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-338

SAMPLE ID B8/8.5-10

FRACTION 04A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/20/90 16:15:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 07/01/90

FILE #: 0701A07A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT Work Order # N0-06-338
Results by Sample

SAMPLE ID B8/8.5-10 FRACTION 04A TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/20/90 16:15:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_12
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B8/13.5-15 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 06/20/90 Category SOIL

PCT_S	TPH_S
84 % wt.	<25 mg/kg

SAMPLE ID B9-5-6.5 SAMPLE # 06 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 07:25:00 Category SOIL

PCT_S	TPH_S
76 % wt.	<25 mg/kg

KEMRON REPORT Work Order # N0-06-338
Results by Sample

SAMPLE ID B9-5-6,5 FRACTION 06A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 07:25:00 Category SOIL

ANALYST: SWC FILE #: 0702A06A
INSTRMT: HP_III INJECTED: 07/03/90 FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT Work Order # N0-06-338

Results by Sample

SAMPLE ID B9-5-6.5 FRACTION 06B TEST CODE M8100 NAME Polyaromatic Hydrocarbons

Date & Time Collected 06/21/90 07:25:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_13

INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT

DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B9-13.5-15 SAMPLE # 07 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 07:45:00 Category SOIL

PCT_S	80	TPH_S	<25
	% wt.		mg/kg

SAMPLE ID B9-13,5-15 FRACTION 07A TEST CODE BETXQC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 07:45:00 Category SOIL

ANALYST: SWC FILE #: 0701A09A
INSTRMT: HP_III INJECTED: 07/01/90 FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT Work Order # NO-06-338
Results by Sample

SAMPLE ID B9-13.5-15 FRACTION 07B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 07:45:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_14
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B10-5-6.5 SAMPLE # 08 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 09:00:00 Category SOIL

PCT_S	73	TPH_S	<25
	% wt.		mg/kg

SAMPLE ID B10-5-6.5 FRACTION 08A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 09:00:00 Category SOIL

ANALYST: SWC FILE #: 0703C05A
INSTRMT: HP_III INJECTED: 07/03/90 FACTOR: *5 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	25
100-41-4	Ethylbenzene	BQL	25
108-88-3	Toluene	BQL	25
1330-20-7	Xylenes, Total	BQL	25

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED
* = ELEVATED DETECTION LIMITS DUE TO SAMPLE MATRIX

SAMPLE ID B10-5-6.5 FRACTION 08B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 09:00:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_15
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT	
91-20-3	Naphthalene	BDL	30	VERIFIED: RJW
208-96-8	Acenaphthylene	BDL	30	
83-32-9	Acenaphthene	BDL	30	
86-73-7	Fluorene	BDL	30	
85-01-8	Phenanthrene	BDL	30	
120-12-7	Anthracene	BDL	30	
206-44-0	Fluoranthene	BDL	30	
129-00-0	Pyrene	BDL	30	
56-55-3	Benzo(a)anthracene	BDL	200	
218-01-9	Chrysene	BDL	200	
205-99-2	Benzo(b)fluoranthene	BDL	200	
207-08-9	Benzo(k)fluoranthene	BDL	200	
50-32-8	Benzo(a)pyrene	BDL	200	
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200	
53-70-3	Dibenzo(a,h)anthracene	BDL	200	
191-24-2	Benzo(g,h,i)perylene	BDL	200	

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B10-10-11.5 SAMPLE # 09 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 09:10:00 Category SOIL

PCT_S	TPH_S
81	<25
% wt.	mg/kg

Results by Sample

SAMPLE ID B10-10-11.5 FRACTION 09A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 09:10:00 Category SOIL

ANALYST: SWC FILE #: 0701A11A
INSTRMT: HP_III INJECTED: 07/01/90 FACTOR: *5 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	25
100-41-4	Ethylbenzene	BQL	25
108-88-3	Toluene	BQL	25
1330-20-7	Xylenes, Total	BQL	25

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED
* = ELEVATED DETECTION LIMIT DUE TO SAMPLE MATRIX

KEMRON REPORT
Results by Sample

Work Order # N0-06-338

SAMPLE ID B10-10-11.5 FRACTION 09B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 09:10:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_16
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B11-5-6.5 SAMPLE # 10 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 14:55:00 Category SOIL

PCT_S	71	TPH_S	<25
	% wt.		mg/kg

KEMRON REPORT
Results by Sample

Work Order # NO-06-338

SAMPLE ID B11-5-6.5 FRACTION 10A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 14:55:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 07/01/90 FILE #: 0701A12A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

Received: 06/23/90

KEMRON REPORT Work Order # N0-06-338
Results by Sample

SAMPLE ID B11-5-6.5 FRACTION 10B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 14:55:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_17
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	33	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	71	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B11-13.5-15 SAMPLE # 11 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 15:10:00 Category SOIL

PCT_S	62	TPH_S	<25
	% wt.		mg/kg

KEMRON REPORT
Results by Sample

Work Order # N0-06-338

SAMPLE ID B11-13.5-15 FRACTION 11A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 15:10:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 07/01/90 FILE #: 0701A13A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT Work Order # N0-06-338
Results by Sample

SAMPLE ID B11-13.5-15 FRACTION 11B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 15:10:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_18
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B12-13.5-15 SAMPLE # 12 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 14:00:00 Category SOIL

PCT_S	81	TPH_S	<25
	% wt.		mg/kg

Received: 06/23/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-338

SAMPLE ID B12-13.5-15

FRACTION 12A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 14:00:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 07/01/90 FILE #: 0701A14A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

Received: 06/23/90

KEMRON REPORT Work Order # N0-06-338
Results by Sample

SAMPLE ID B12-13.5-15 FRACTION 12B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 14:00:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_19
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B13-13.5-15 SAMPLE # 13 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category SOIL

PCT_S	TPH_S
61	<25
% wt.	mg/kg

Received: 06/23/90

KEMRON REPORT
07/11/90 16:27:23

Work Order # N0-06-338

REPORT TO: Wapora, Inc.
1815 Century Blvd.
Suite 150
Atlanta,GA 30345
ATTEN John Dwyer

CLIENT WAPATL 59227 SAMPLES 13
COMPANY Wapora, Inc.
FACILITY Atlanta
FAX # (404) 636-7162

WORK ID 819-300/Chicora Tank Farm
TAKEN Hausner/Beck
TRANS Fed Ex
TYPE
P.O. #
INVOICE under separate cover

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

CERTIFIED BY

ATTEN
PHONE (614) 373-4071 CONTACT G CROSS

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

JUL

SAMPLE IDENTIFICATION

01	B7/3.5-5
02	B7/10-11.5
03	B8/3.5-5
04	B8/8.5-10
05	B8/13.5-15
06	B9-5-6.5
07	B9-13.5-15
08	B10-5-6.5
09	B10-10-11.5
10	B11-5-6.5
11	B11-13.5-15
12	B12-13.5-15
13	B13-13.5-15

TEST CODES and NAMES used on this report

BETXGC	Volatile Organics (BETX)
M8100	Polyaromatic Hydrocarbons
PCT_S	Percent Solids
TPH_S	Petroleum Hydrocarbons

KEMRON ENVIRONMENTAL SERVICES

SAMPLE ID B7/3.5-5 SAMPLE # 01 FRACTIONS: A,B,C
Date & Time Collected 06/20/90 Category SOIL

PCT_S	83	TPH_S	<25
	% wt.		mg/kg

Received: 06/23/90

KEMRON REPORT Work Order # N0-06-338
Results by Sample

SAMPLE ID B7/3.5-5 FRACTION 01A TEST CODE BETXQC NAME Volatile Organics (BETX)
Date & Time Collected 06/20/90 Category SOIL

ANALYST: SWC FILE #: 0702A03A
INSTRMT: HP_III INJECTED: 07/03/90 FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	7	5.0
100-41-4	Ethylbenzene	7	5.0
108-88-3	Toluene	21	5.0
1330-20-7	Xylenes, Total	27	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

Received: 06/23/90

KEMRON REPORT Work Order # N0-06-338
Results by Sample

SAMPLE ID B7/3.5-5 FRACTION 01B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/20/90 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_9
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B13-13.5-15 FRACTION 13A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category SOIL

ANALYST: SWC FILE #: 0701A15A
INSTRMT: HP_III INJECTED: 07/01/90 FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT		PQL
71-43-2	Benzene	BQL		5.0
100-41-4	Ethylbenzene	BQL		5.0
108-88-3	Toluene		15	5.0
1330-20-7	Xylenes, Total	BQL		5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

SAMPLE ID B13-13.5-15 FRACTION 13B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE_20
INSTRMT: HP_II INJECTED: 07/10/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

KEMRON REPORT
Test Methodology

TEST CODE **BETXGC** NAME **Volatile Organics (BETX)**

EPA Method 8020 (SW-846)

TEST CODE **M8100** NAME **Polyaromatic Hydrocarbons**

EPA Method 8100 SW-846

TEST CODE **PCT_S** NAME **Percent Solids**

EPA Method 160.3 - Gravimetric, Dryed at 103-105 Degrees C
To convert test results to "Dry Weight Basis" use this formula:

$$\text{RESULT (DRY WT.)} = \frac{\text{RESULT (REPORTED) X 100}}{\text{PERCENT SOLIDS}}$$

TEST CODE **TPH_S** NAME **Petroleum Hydrocarbons**

EPA Method 418.1

WAPORA
Environmental Engineers/Scientists

№ 0884

CHAIN-OF-CUSTODY RECORD

NOTE: Laboratory will homogenize comp. samples

I will call Monday (6/25/90) to transmit prices agreed on earlier

Project Contact: Kurt Hausner

Turn Around Requirements: Normal

Project No.: 819-300 | Project Name: Chevron Tank Farm

Sampler (print): Kurt D. Hausner, Greg A. Beck | Signature: Kurt Hausner, Greg A. Beck

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location	NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-P.P.L.	TOT. METALS-RCRA	PCBs	PESTICIDES	PNA	TPH BETX	TPH PAH	ADDITIONAL REQUIREMENTS
B7-3.5-5		✓	6/20	—	B7-3.5-5	3												✓	✓	✓	
B7-10-11.5		✓	6/20	—	B7-10-11.5	3												✓	✓	✓	
B8-3.5-5		✓	6/20	1610	B8-3.5-5	3												✓	✓	✓	* Received Broke
B8-8.5-10		✓	6/20	1615	B8-8.5-10	2													✓	✓	* Received out of order
[redacted]B8-13.5-15		✓	6/20	—	B8-13.5-15	1												✓			
B9-5-6.5		✓	6/21	7:25	B9-5-6.5	3												✓	✓	✓	
B9-13.5-15		✓	6/21	7:45	B9-13.5-15	3												✓	✓	✓	
B10-5-6.5		✓	6/21	9:00	B10-5-6.5	3												✓	✓	✓	
B10-10-11.5		✓	6/21	9:10	B10-10-11.5	3												✓	✓	✓	
B11-5-6.5		✓	6/21	14:55	B11-5-6.5	3												✓	✓	✓	
B11-13.5-15		✓	6/21	15:10	B11-13.5-15	3												✓	✓	✓	
B12-13.5-15		✓	6/21	14:00	B12-13.5-15	3												✓	✓	✓	
B13-13.5-15		✓	6/21	—	B13-13.5-15	3												✓	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Kurt Hausner	6/22	1700					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Janet Williams	6/25		

W-AD6 White - Lab Yellow - Cl

Received: 06/25/90 07/16/90 12:36:44

REPORT TO: Wapora, Inc.
1815 Century Blvd.
Suite 150
Atlanta,GA 30345
ATTEN: Kurt Hausner

CLIENT: WAPATL 59227 SAMPLES: 13
COMPANY: Wapora, Inc.
FACILITY: Atlanta
FAX # (404) 636-7162

WORK ID: #819-300/Chicora Tk. Farm
TAKEN: Hausner/Beck
TRANS: Fed Ex
TYPE:
P.O. #:
INVOICE: under separate cover

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

CERTIFIED BY

ATTEN:
PHONE: (614) 373-4071 CONTACT: G CROSS

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

SAMPLE IDENTIFICATION

01	B2-5-6.5
02	B3-10-11.5
03	B1-15-16.5
04	B3-15-16.5
05	B5-4.5-6
06	B6-10-11.5
07	B1-5-6.5
08	B2-15-16.5
09	B4-15-16.5
10	B4-5-6.5
11	B6-5-6.5
12	B5-14.5-16
13	DFSP

TEST CODES and NAMES used on this report

BETXGC	Volatile Organics (BETX)
M8100	Polyaromatic Hydrocarbons
PCT_S	Percent Solids
TPH_S	Petroleum Hydrocarbons

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B2-5-6.5

SAMPLE # 01 FRACTIONS: A,B,C
Date & Time Collected 06/19/90 11:00:00 Category SOIL

PCT_S	84	TPH_S	<25
	% wt.		mg/kg

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B2-5-6.5

FRACTION 01A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/19/90 11:00:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 06/29/90

FILE #: 0629C03A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B2-5-6.5

FRACTION 01B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/19/90 11:00:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE11
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B3-10-11.5 SAMPLE # 02 FRACTIONS: A,B
Date & Time Collected 06/19/90 15:10:00 Category SOIL

PCT_S	72	TPH_S	<25
	% wt.		mg/kg

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # NO-06-343

SAMPLE ID B3-10-11.5

FRACTION 02A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/19/90 15:10:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 06/29/90 FILE #: 0629C04A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B3-10-11.5 FRACTION 02B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/19/90 15:10:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE22
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B1-15-16.5 SAMPLE # 03 FRACTIONS: A,B,C
Date & Time Collected 06/19/90 09:10:00 Category SOIL

PCT_S	80	TPH_S	<25
	% wt.		mg/kg

SAMPLE ID B1-15-16.5 FRACTION 03A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/19/90 09:10:00 Category SOIL

ANALYST: SWC FILE #: 0701A14A
INSTRMT: HP_III INJECTED: 07/01/90 FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

SAMPLE ID B1-15-16.5 FRACTION 03B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/19/90 09:10:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE23
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT	
91-20-3	Naphthalene	BDL	30	VERIFIED: DMD
208-96-8	Acenaphthylene	BDL	30	
83-32-9	Acenaphthene	BDL	30	
86-73-7	Fluorene	BDL	30	
85-01-8	Phenanthrene	BDL	30	
120-12-7	Anthracene	BDL	30	
206-44-0	Fluoranthene	BDL	30	
129-00-0	Pyrene	BDL	30	
56-55-3	Benzo(a)anthracene	BDL	200	
218-01-9	Chrysene	BDL	200	
205-99-2	Benzo(b)fluoranthene	BDL	200	
207-08-9	Benzo(k)fluoranthene	BDL	200	
50-32-8	Benzo(a)pyrene	BDL	200	
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200	
53-70-3	Dibenzo(a,h)anthracene	BDL	200	
191-24-2	Benzo(g,h,i)perylene	BDL	200	

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B3-15-16.5 SAMPLE # 04 FRACTIONS: A,B,C
Date & Time Collected 06/19/90 15:15:00 Category SOIL

PCT_S	73	TPH_S	<25
	% wt.		mg/kg

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B3-15-16.5

FRACTION 04A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/19/90 15:15:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 06/29/90

FILE #: 0629C06A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

SAMPLE ID B3-15-16.5 FRACTION 04B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/19/90 15:15:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE24
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B5-4.5-6 SAMPLE # 05 FRACTIONS: A,B,C
Date & Time Collected 06/20/90 07:40:00 Category SOIL

PCT_S	83	TPH_S	<25
	% wt.		mg/kg

Received: 06/25/90
Results by Sample

SAMPLE ID B5-4,5-6 FRACTION 05A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/20/90 07:40:00 Category SOIL

ANALYST: SWC FILE #: 0701A15A
INSTRMT: HP_III INJECTED: 07/01/90 FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B5-4,5-6

FRACTION 05B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/20/90 07:40:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE25
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B6-10-11.5 SAMPLE # 06 FRACTIONS: A,B,C
Date & Time Collected 06/20/90 10:40:00 Category SOLID

PCT_S	TPH_S
79	<25
% wt.	mg/kg

KEMRON REPORT
Results by Sample

Work Order # NO-06-343

SAMPLE ID B6-10-11.5

FRACTION 06A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/20/90 10:40:00 Category SOLID

ANALYST: SWC
INSTRMT: HP_III INJECTED: 07/02/90
FILE #: 0702A03A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT Work Order # N0-06-343
Results by Sample

SAMPLE ID B6-10-11.5 FRACTION 06B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/20/90 10:40:00 Category SOLID

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE26
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B1-5-6.5 SAMPLE # 07 FRACTIONS: A,B,C
Date & Time Collected 06/19/90 08:50:00 Category SOLID

PCT_S	86	TPH_S	<25
	% wt.		mg/kg

SAMPLE ID B1-5-6.5 FRACTION 07A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/19/90 08:50:00 Category SOLID

ANALYST: SWC FILE #: 0629C09A
INSTRMT: HP_III INJECTED: 06/29/90 FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B1-5-6.5

FRACTION 07B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/19/90 08:50:00 Category SOLID

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE27
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B2-15-16.5

SAMPLE # 08 FRACTIONS: A,B,C

Date & Time Collected 06/19/90 11:15:00 Category SOLID

PCT_S	TPH_S
82	<25
% wt.	mg/kg

Only Report for

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B2-15-16.5 FRACTION 08A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/19/90 11:15:00 Category SOLID

ANALYST: SWC
INSTRMT: HP_III INJECTED: 06/29/90 FILE #: 0629C10A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT Work Order # N0-06-343
Results by Sample

SAMPLE ID B2-15-16.5 FRACTION 08B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/19/90 11:15:00 Category SOLID

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE28
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

KEMRON REPORT
Results by Sample

SAMPLE ID B4-15-16.5 SAMPLE # 09 FRACTIONS: A,B,C
Date & Time Collected 06/19/90 17:00:00 Category SOIL

PCT_S	TPH_S
56 % wt.	<25 mg/kg

Results by Sample

SAMPLE ID B4-15-16,5 FRACTION 09A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/19/90 17:00:00 Category SOIL

ANALYST: SWC FILE #: 0629C11A
INSTRMT: HP_III INJECTED: 06/29/90 FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT
Results by Sample

SAMPLE ID B4-15-16.5 FRACTION 09B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/19/90 17:00:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE29
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B4-5-6.5 SAMPLE # 10 FRACTIONS: A,B,C
Date & Time Collected 06/19/90 16:40:00 Category SOIL

PCT_S	TPH_S
82	<25
% wt.	mg/kg

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B4-5-6.5 FRACTION 10A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/19/90 16:40:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 06/30/90 FILE #: 0629C12A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B4-5-6.5 FRACTION 10B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/19/90 16:40:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE30
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B6-5-6.5 SAMPLE # 11 FRACTIONS: A,B,C
Date & Time Collected 06/20/90 10:30:00 Category SOIL

PCT_S	TPH_S
79	<25
% wt.	mg/kg

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B6-5-6.5

FRACTION 11A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/20/90 10:30:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 06/30/90 FILE #: 0629C13A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B6-5-6.5

FRACTION 11B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/20/90 10:30:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE31
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	30
208-96-8	Acenaphthylene	BDL	30
83-32-9	Acenaphthene	BDL	30
86-73-7	Fluorene	BDL	30
85-01-8	Phenanthrene	BDL	30
120-12-7	Anthracene	BDL	30
206-44-0	Fluoranthene	BDL	30
129-00-0	Pyrene	BDL	30
56-55-3	Benzo(a)anthracene	BDL	200
218-01-9	Chrysene	BDL	200
205-99-2	Benzo(b)fluoranthene	BDL	200
207-08-9	Benzo(k)fluoranthene	BDL	200
50-32-8	Benzo(a)pyrene	BDL	200
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200
53-70-3	Dibenzo(a,h)anthracene	BDL	200
191-24-2	Benzo(g,h,i)perylene	BDL	200

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID B5-14.5-16 SAMPLE # 12 FRACTIONS: A,B,C
Date & Time Collected 06/20/90 07:55:00 Category SOIL

PCT_S	TPH_S
59	<25
% wt.	mg/kg

Received: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID B5-14.5-16

FRACTION 12A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/20/90 07:55:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 06/30/90

FILE #: 0629C15A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

SAMPLE ID B5-14.5-16 FRACTION 12B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/20/90 07:55:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE32
INSTRMT: HP_II INJECTED: 07/11/90 FACTOR: 33 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT	
91-20-3	Naphthalene	BDL	30	VERIFIED: DMD
208-96-8	Acenaphthylene	BDL	30	
83-32-9	Acenaphthene	BDL	30	
86-73-7	Fluorene	BDL	30	
85-01-8	Phenanthrene	BDL	30	
120-12-7	Anthracene	BDL	30	
206-44-0	Fluoranthene	BDL	30	
129-00-0	Pyrene	BDL	30	
56-55-3	Benzo(a)anthracene	BDL	200	
218-01-9	Chrysene	BDL	200	
205-99-2	Benzo(b)fluoranthene	BDL	200	
207-08-9	Benzo(k)fluoranthene	BDL	200	
50-32-8	Benzo(a)pyrene	BDL	200	
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	200	
53-70-3	Dibenzo(a,h)anthracene	BDL	200	
191-24-2	Benzo(g,h,i)perylene	BDL	200	

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID DFSP SAMPLE # 13 FRACTIONS: A
Date & Time Collected 06/18/90 14:00:00 Category SOIL

PCT_S	81	TPH_S	320
	% wt.		mg/kg

Received: 06/25/90

KEMRON REPORT Work Order # N0-06-343
Results by Sample

SAMPLE ID DFSP

FRACTION 13A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/18/90 14:00:00 Category SOIL

ANALYST: SWC
INSTRMT: HP_III INJECTED: 07/01/90 FILE #: 0701A15A
FACTOR: 1 UNITS: ug/kg VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BDL	5.0
100-41-4	Ethylbenzene	BDL	5.0
108-88-3	Toluene	BDL	5.0
1330-20-7	Xylenes, Total	BDL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANITATION LIMIT (PQL)
NA = NOT ANALYZED

KEMRON REPORT
Results by Sample

Work Order # N0-06-343

SAMPLE ID DF8P

FRACTION 13A TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/18/90 14:00:00 Category SOIL

ANALYST: EDG EXTRACTED: 07/05/90 FILE #: SAMPLE2
INSTRMT: HP_II INJECTED: 07/12/90 FACTOR: 3300 UNITS: ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	3000
208-96-8	Acenaphthylene	4300	3000
83-32-9	Acenaphthene	4000	3000
86-73-7	Fluorene	4400	3000
85-01-8	Phenanthrene	BDL	3000
120-12-7	Anthracene	BDL	3000
206-44-0	Fluoranthene	BDL	3000
129-00-0	Pyrene	BDL	3000
56-55-3	Benzo(a)anthracene	BDL	20000
218-01-9	Chrysene	BDL	20000
205-99-2	Benzo(b)fluoranthene	BDL	20000
207-08-9	Benzo(k)fluoranthene	BDL	20000
50-32-8	Benzo(a)pyrene	BDL	20000
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	20000
53-70-3	Dibenzo(a,h)anthracene	BDL	20000
191-24-2	Benzo(g,h,i)perylene	BDL	20000

VERIFIED: DMD

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

Test Methodology

TEST CODE **BETXGC** NAME **Volatile Organics (BETX)**

EPA Method 8020 (SW-846)

TEST CODE **M8100** NAME **Polyaromatic Hydrocarbons**

EPA Method 8100 SW-846

TEST CODE **PCT_S** NAME **Percent Solids**

EPA Method 160.3 - Gravimetric, Dryed at 103-105 Degrees C
To convert test results to "Dry Weight Basis" use this formula:

$$\text{RESULT (DRY WT.)} = \frac{\text{RESULT (REPORTED) X 100}}{\text{PERCENT SOLIDS}}$$

TEST CODE **TPH_S** NAME **Petroleum Hydrocarbons**

EPA Method 418.1

KEMRON ENVIRONMENTAL SERVICES

№ 19649

CHAIN-OF-CUSTODY RECORD

I WILL CALL MONDAY (6/25/90) TO TRANSMIT PRICES AGREED ON EARLIER

Project Contact: Kurt Hausner

Turn Around Requirements: Normal

Project No.:	Project Name:
819-300	Chicora Tank Farm

Sampler (print): Kurt D. Hausner, Greg A. Beck

Signature: Kurt D. Hausner, Greg A. Beck

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location		NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-PP.L	TOT. METALS-RCRA	PCBs	PESTICIDES	TPH	BETX	PHENOLICS	PAH	ADDITIONAL REQUIREMENTS
B2 5-6.5		✓	6/19	1100	B2 5-6.5	1	3												✓	✓		✓	
B3 10-11.5		✓	6/19	1510	B3 10-11.5	2	3												✓	✓		✓	* one received broken
B1 15-16.5		✓	6/19	0910	B1 15-16.5	3	3												✓	✓		✓	
B3 15-16.5		✓	6/19	1515	B3 15-16.5	4	3												✓	✓		✓	
B5 4.5-6		✓	6/20	0740	B5 4.5-6	5	3												✓	✓		✓	
B6 10-11.5		✓	6/20	1040	B6 10-11.5	6	3												✓	✓		✓	
B1 5-6.5		✓	6/19	0850	B1 5-6.5	7	3												✓	✓		✓	
B2 15-16.5		✓	6/19	1115	B2 15-16.5	8	3												✓	✓		✓	
B4 15-16.5		✓	6/19	1700	B4 15-16.5	9	3												✓	✓		✓	
B4 5-6.5		✓	6/19	1640	B4 5-6.5	10	3												✓	✓		✓	
B6 5-6.5		✓	6/20	1030	B6 5-6.5	11	3												✓	✓		✓	
B5 14.5-16		✓	6/20	0755	B5 14.5-16	12	3												✓	✓		✓	
TRENCH		✓	6/18	1400	DFSP	13	1																

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Kurt D. Hausner	6/22	1700					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Janet Williams	6/25		

W-AD6

White - Lab Yellow - Office

APPENDIX F

WATER SAMPLE LABORATORY RESULTS

ceived: 06/23/90 07/11/90 13:09:36

REPORT TO: Wapora, Inc.
1815 Century Blvd.
Suite 150
Atlanta,GA 30345
ATTEN: John.Dwyer

CLIENT: WAPATL 59227 SAMPLES: 3
OMPANY: Wapora, Inc.
CILITY: Atlanta
FAX # (404) 636-7162

ORK ID: 819-300 Chicora Tank Farm
TAKEN: K.Hausner/G.Beck
TRANS: Fed Ex
TYPE:
P.O. #:
NVOICE: under separate cover

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

CERTIFIED BY

ATTEN:
PHONE: (614) 373-4071 CONTACT G CROSS

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

SAMPLE IDENTIFICATION
MW-1
MW-2
MW-12

TEST CODES and NAMES used on this report	
BETXGC	Volatile Organics (BETX)
M8100	Polyaromatic Hydrocarbons
TPH	Petroleum Hydrocarbons

kemron ENVIRONMENTAL SERVICES

SAMPLE ID MW-1 SAMPLE # 01 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category WATER

TPH	<1	mg/l

SAMPLE ID MW-6 FRACTION 01B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC FILE #: 0627C06A
INSTRMT: HP_III INJECTED: 06/27/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

SAMPLE ID MW-6 FRACTION 01C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_16
INSTRMT: HP_II INJECTED: 07/08/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	1
208-96-8	Acenaphthylene	BDL	1
83-32-9	Acenaphthene	BDL	1
86-73-7	Fluorene	BDL	1
85-01-8	Phenanthrene	BDL	1
120-12-7	Anthracene	BDL	1
206-44-0	Fluoranthene	BDL	1
129-00-0	Pyrene	BDL	1
56-55-3	Benzo(a)anthracene	BDL	5
218-01-9	Chrysene	BDL	5
205-99-2	Benzo(b)fluoranthene	BDL	5
207-08-9	Benzo(k)fluoranthene	BDL	5
50-32-8	Benzo(a)pyrene	BDL	5
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5
53-70-3	Dibenzo(a,h)anthracene	BDL	5
191-24-2	Benzo(g,h,i)perylene	BDL	5

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID MW-7 SAMPLE # 02 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category WATER

TPH	<1	mg/l

Received: 06/23/90
Results by Sample

SAMPLE ID MW-7 FRACTION 02B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC FILE #: 0627C07A
INSTRMT: HP_III INJECTED: 06/27/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

SAMPLE ID MW-7 FRACTION 02C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_17
INSTRMT: HP_II INJECTED: 07/08/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	1
208-96-8	Acenaphthylene	BDL	1
83-32-9	Acenaphthene	BDL	1
86-73-7	Fluorene	BDL	1
85-01-8	Phenanthrene	BDL	1
120-12-7	Anthracene	BDL	1
206-44-0	Fluoranthene	BDL	1
129-00-0	Pyrene	BDL	1
56-55-3	Benzo(a)anthracene	BDL	5
218-01-9	Chrysene	BDL	5
205-99-2	Benzo(b)fluoranthene	BDL	5
207-08-9	Benzo(k)fluoranthene	BDL	5
50-32-8	Benzo(a)pyrene	BDL	5
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5
53-70-3	Dibenzo(a,h)anthracene	BDL	5
191-24-2	Benzo(g,h,i)perylene	BDL	5

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID MW-8 SAMPLE # 03 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category WATER

TPH	<1
	mg/l

SAMPLE ID MW-8 FRACTION 03B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC FILE #: 0627C08A
INSTRMT: HP_III INJECTED: 06/28/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

Received: 06/23/90
Results by Sample

SAMPLE ID MW-8 FRACTION 03C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_18
INSTRMT: HP_II INJECTED: 07/08/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT	
91-20-3	Naphthalene	BDL	1	VERIFIED: RJW
208-96-8	Acenaphthylene	BDL	1	
83-32-9	Acenaphthene	BDL	1	
86-73-7	Fluorene	BDL	1	
85-01-8	Phenanthrene	BDL	1	
120-12-7	Anthracene	BDL	1	
206-44-0	Fluoranthene	BDL	1	
129-00-0	Pyrene	BDL	1	
56-55-3	Benzo(a)anthracene	BDL	5	
218-01-9	Chrysene	BDL	5	
205-99-2	Benzo(b)fluoranthene	BDL	5	
207-08-9	Benzo(k)fluoranthene	BDL	5	
50-32-8	Benzo(a)pyrene	BDL	5	
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5	
53-70-3	Dibenzo(a,h)anthracene	BDL	5	
191-24-2	Benzo(g,h,i)perylene	BDL	5	

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID MW-9 SAMPLE # 04 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category WATER

TPH	<1
	mg/l

SAMPLE ID MW-9 FRACTION 04B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC FILE #: 0627C09A
INSTRMT: HP_III INJECTED: 06/28/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

SAMPLE ID MW-9 FRACTION 04C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_19
INSTRMT: HP_II INJECTED: 07/08/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT	
91-20-3	Naphthalene	BDL	1	VERIFIED: RJW
208-96-8	Acenaphthylene	BDL	1	
83-32-9	Acenaphthene	BDL	1	
86-73-7	Fluorene	BDL	1	
85-01-8	Phenanthrene	BDL	1	
120-12-7	Anthracene	BDL	1	
206-44-0	Fluoranthene	BDL	1	
129-00-0	Pyrene	BDL	1	
56-55-3	Benzo(a)anthracene	BDL	5	
218-01-9	Chrysene	BDL	5	
205-99-2	Benzo(b)fluoranthene	BDL	5	
207-08-9	Benzo(k)fluoranthene	BDL	5	
50-32-8	Benzo(a)pyrene	BDL	5	
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5	
53-70-3	Dibenzo(a,h)anthracene	BDL	5	
191-24-2	Benzo(g,h,i)perylene	BDL	5	

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

Results by Sample

SAMPLE ID MW-10 SAMPLE # 05 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category WATER

TPH	<1
	mg/l

SAMPLE ID MW-10 FRACTION 05B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC FILE #: 0627C10A
INSTRMT: HP_III INJECTED: 06/28/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-38-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

SAMPLE ID MW-10 FRACTION 05C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_20
INSTRMT: HP_II INJECTED: 07/08/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT	
91-20-3	Naphthalene	BDL	1	VERIFIED: RJW
208-96-8	Acenaphthylene	BDL	1	
83-32-9	Acenaphthene	BDL	1	
86-73-7	Fluorene	BDL	1	
85-01-8	Phenanthrene	BDL	1	
120-12-7	Anthracene	BDL	1	
206-44-0	Fluoranthene	BDL	1	
129-00-0	Pyrene	BDL	1	
56-55-3	Benzo(a)anthracene	BDL	5	
218-01-9	Chrysene	BDL	5	
205-99-2	Benzo(b)fluoranthene	BDL	5	
207-08-9	Benzo(k)fluoranthene	BDL	5	
50-32-8	Benzo(a)pyrene	BDL	5	
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5	
53-70-3	Dibenzo(a,h)anthracene	BDL	5	
191-24-2	Benzo(g,h,i)perylene	BDL	5	

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID MW-11 SAMPLE # 06 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category WATER

TPH	<1	mg/l

SAMPLE ID MW-11 FRACTION 06B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC FILE #: 0627C11A
INSTRMT: HP_III INJECTED: 06/28/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

Results by Sample

SAMPLE ID MW-11 FRACTION 06C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_21
INSTRMT: HP_II INJECTED: 07/08/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT	
91-20-3	Naphthalene	BDL	1	VERIFIED: RJW
208-96-8	Acenaphthylene	BDL	1	
83-32-9	Acenaphthene	BDL	1	
86-73-7	Fluorene	BDL	1	
85-01-8	Phenanthrene	BDL	1	
120-12-7	Anthracene	BDL	1	
206-44-0	Fluoranthene	BDL	1	
129-00-0	Pyrene	BDL	1	
56-55-3	Benzo(a)anthracene	BDL	5	
218-01-9	Chrysene	BDL	5	
205-99-2	Benzo(b)fluoranthene	BDL	5	
207-08-9	Benzo(k)fluoranthene	BDL	5	
50-32-8	Benzo(a)pyrene	BDL	5	
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5	
53-70-3	Dibenzo(a,h)anthracene	BDL	5	
191-24-2	Benzo(g,h,i)perylene	BDL	5	

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

KEMRON REPORT

Work Order # NO-06-336

Test Methodology

TEST CODE **BETXGC** NAME **Volatile Organics (BETX)**

EPA Method 8020 (SW-846)

TEST CODE **M8100** NAME **Polyaromatic Hydrocarbons**

EPA Method 8100 SW-846

TEST CODE **TPH** NAME **Petroleum Hydrocarbons**

EPA Method 418.1

WESTPORA

Environmental Engineers/Scientists

№ 0905

CHAIN-OF-CUSTODY RECORD

NOTE: Laboratory will homogenize comp. samples

Project Contact: Kurt Hausner

Will call Monday, 6/25 to with prices negotiated earlier

Turn Around Requirements: Normal

Page 1 of 1

Project No.: 819-300

Project Name: Chicora Tank Farm

Sampler (print): Kurt D. Hausner, Greg A. Beck

Signature: Kurt Hausner, Greg A. Beck

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location	NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-PPL.	TOT. METALS-RCRA	PCBs	PESTICIDES	TPH	BETX	PAH	ADDITIONAL REQUIREMENTS
MW-9		✓	6/21		MW-9	5											✓	✓	✓	✓	
MW-10		✓	6/21		MW-9	5											✓	✓	✓	✓	
MW-11		✓	6/21		MW-9	5											✓	✓	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Kurt Hausner	6/22	1200					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Janet Williams	6/25		

W-AD6

White - Lab Yellow - Office Pink - Field

WESTPORA

Environmental Engineers/Scientists

№ 0906

CHAIN-OF-CUSTODY RECORD

NOTE: Laboratory will homogenize comp. samples

will call Monday 6/25/90 with earlier negotiated prices

Page 1 of 1

Project Contact: Kurt Hausner

Turn Around Requirements: Normal

Project No.: 614-300

Project Name: Chicoria Tank Farm

Sampler (print): Kurt D. Hausner, Greg A. Beck

Signature: [signature], Greg A Beck

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location	NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-P.P.L.	TOT. METALS-RCRA	PCBs	PESTICIDES	TPH	BETX	PAH	ADDITIONAL REQUIREMENTS
MW 6		✓	6/21		MW 6	5											✓	✓	✓	✓	
MW 7		✓	6/21		MW 7												✓	✓	✓	✓	
MW 8		✓	6/21		MW 8												✓	✓	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	6/22	1200					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Janet Wilson	6/25		

W-AD6

White - Lab Yellow - Office Pink - Field

ɔceived: 06/25/90 07/11/90 11:38:02

REPORT TO: Wapora, Inc.
1815 Century Blvd.
Suite 150
Atlanta,GA 30345
ATTEN: Kurt Hausner

CLIENT: WAPATL 59227 SAMPLES: 3
COMPANY: Wapora, Inc.
FACILITY: Atlanta
FAX # (404) 636-7162

WORK ID: #819-300/Chicora Tk. Farm
TAKEN: Hausner/Beck
TRANS TYPE: Fed Ex
P.O. #:
INVOICE: under separate cover

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

L Bucura
CERTIFIED BY

ATTEN:
PHONE: (614) 373-4071

CONTACT G CROSS

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

SAMPLE IDENTIFICATION

MW-3
MW-4
MW-5

TEST CODES and NAMES used on this report

BETXGC	Volatile Organics (BETX)
M8100	Polyaromatic Hydrocarbons
TPH	Petroleum Hydrocarbons

Kemron
ENVIRONMENTAL SERVICES

Results by Sample

SAMPLE ID MW-3 SAMPLE # 01 FRACTIONS: A,B,C

Date & Time Collected 06/21/90 Category WATER

TPH	<1
	mg/l

SAMPLE ID MW-3 FRACTION 01B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC FILE #: 0628B03A
INSTRMT: HP_III INJECTED: 06/28/90 FACTOR: 1 UNITS: ug/L VERIFIED:

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEFINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANTITATION LIMIT (PQL)
NA = NOT ANALYZED

eived: 06/25/90

KEMRON REPORT Work Order # N0-06-342
Results by Sample

IPLE ID MW-3 FRACTION 01C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_22
INSTRMT: HP_II INJECTED: 07/08/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	1
208-96-8	Acenaphthylene	BDL	1
83-32-9	Acenaphthene	BDL	1
86-73-7	Fluorene	BDL	1
85-01-8	Phenanthrene	BDL	1
120-12-7	Anthracene	BDL	1
206-44-0	Fluoranthene	BDL	1
129-00-0	Pyrene	BDL	1
56-55-3	Benzo(a)anthracene	BDL	5
218-01-9	Chrysene	BDL	5
205-99-2	Benzo(b)fluoranthene	BDL	5
207-08-9	Benzo(k)fluoranthene	BDL	5
50-32-8	Benzo(a)pyrene	BDL	5
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5
53-70-3	Dibenzo(a,h)anthracene	BDL	5
191-24-2	Benzo(g,h,i)perylene	BDL	5

VERIFIED: RJW

TES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID MW-4 SAMPLE # 02 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category WATER

TPH <1
mg/l

eived: 06/25/90 Results by Sample

PLE ID MW-4 FRACTION 02B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC FILE #: 0628B05A
INSTRMT: HP_III INJECTED: 06/28/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

TES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

ceived: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-342

MPLE ID MW-4

FRACTION 02C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_23
INSTRMT: HP_II INJECTED: 07/18/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	1
208-96-8	Acenaphthylene	BDL	1
83-32-9	Acenaphthene	BDL	1
86-73-7	Fluorene	BDL	1
85-01-8	Phenanthrene	BDL	1
120-12-7	Anthracene	BDL	1
206-44-0	Fluoranthene	BDL	1
129-00-0	Pyrene	BDL	1
56-55-3	Benzo(a)anthracene	BDL	5
218-01-9	Chrysene	BDL	5
205-99-2	Benzo(b)fluoranthene	BDL	5
207-08-9	Benzo(k)fluoranthene	BDL	5
50-32-8	Benzo(a)pyrene	BDL	5
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5
53-70-3	Dibenzo(a,h)anthracene	BDL	5
191-24-2	Benzo(g,h,i)perylene	BDL	5

VERIFIED: RJW

TES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

KEMRON REPORT
Results by Sample

Work Order # N0-06-342

SAMPLE ID MW-5

SAMPLE # 03 FRACTIONS: A,B,C
Date & Time Collected 06/21/90 Category WATER

TPH <1 mg/l

9 9
ɜived: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-342

ᵖLE ID MW-5

FRACTION 03B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/21/90 Category WATER

ANALYST: SWC
INSTRMT: HP_III INJECTED: 06/28/90 FILE #: 0628B06A
FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

ᵉES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

ceived: 06/25/90

KEMRON REPORT
Results by Sample

Work Order # N0-06-342

MPLE ID MW-5

FRACTION 03C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/21/90 Category WATER

ANALYST: EDG EXTRACTED: 06/28/90 FILE #: SAMPLE_24
INSTRMT: HP_II INJECTED: 07/08/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT	
91-20-3	Naphthalene	BDL	1	VERIFIED: RJW
208-96-8	Acenaphthylene	BDL	1	
83-32-9	Acenaphthene	BDL	1	
86-73-7	Fluorene	BDL	1	
85-01-8	Phenanthrene	BDL	1	
120-12-7	Anthracene	BDL	1	
206-44-0	Fluoranthene	BDL	1	
129-00-0	Pyrene	BDL	1	
56-55-3	Benzo(a)anthracene	BDL	5	
218-01-9	Chrysene	BDL	5	
205-99-2	Benzo(b)fluoranthene	BDL	5	
207-08-9	Benzo(k)fluoranthene	BDL	5	
50-32-8	Benzo(a)pyrene	BDL	5	
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5	
53-70-3	Dibenzo(a,h)anthracene	BDL	5	
191-24-2	Benzo(g,h,i)perylene	BDL	5	

)TES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

e 11
eived: 06/25/90

KEMRON REPORT

Work Order # N0-06-342

Test Methodology

T CODE BETXGC NAME Volatile Organics (BETX)

Method 8020 (SW-846)

T CODE M8100 NAME Polyaromatic Hydrocarbons

Method 8100 SW-846

T CODE TPH NAME Petroleum Hydrocarbons

Method 418.1

VAPORA

Environmental Engineers/Scientists

No. 0907

CHAIN-OF-CUSTODY RECORD

NOTE: Laboratory will homogenize comp. samples

Will Call Monday 6/25/90 with earlier negotiated prices

Page 1 of 1

Project Contact: Kurt Hausner

Turn Around Requirements: Normal

Project No.: 8K-300 | Project Name: Chicura Tank Farm

Sampler (print): Kurt D. Hausner, Greg A. Back | Signature: Kurt Hausner, Greg A. Back

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location	NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-P.P.L.	TOT. METALS-RCRA	PCBs	PESTICIDES	~~PHCs~~	BETX	TPH	ADDITIONAL REQUIREMENTS
MW 3		✓	6/21		MW 3	5											✓		✓	✓	
MW 4		✓	"		MW 4	5											✓		✓	✓	
MW 5		✓	"		MW 5	5											✓		✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Kurt Hausner	6/22	1000					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Janet Williams	6/25		

Received: 06/25/90 07/11/90 12:55:00

REPORT TO: Wapora, Inc.
1815 Century Blvd.
Suite 150
Atlanta,GA 30345
ATTEN John Dwyer

CLIENT WAPATL 59227 SAMPLES 5
COMPANY Wapora, Inc.
FACILITY Atlanta
FAX # (404) 636-7162

WORK ID #819-300/Chicora Tk Farm
TAKEN Hausner/Beck
TRANS Fed Ex
TYPE
P.O. #
INVOICE under separate cover

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

L Bucura
CERTIFIED BY

ATTEN
PHONE (614) 373-4071 CONTACT G CROSS

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

SAMPLE IDENTIFICATION

01 FD-1
02 FD-2
03 MW-13
04 POND-2
05 POND-1

TEST CODES and NAMES used on this report

BETXGC	Volatile Organics (BETX)
M8100	Polyaromatic Hydrocarbons
TPH	Petroleum Hydrocarbons

KEMRON ENVIRONMENTAL SERVICES

Received: 06/25/90 Results by Sample

SAMPLE ID FD-2 FRACTION 02B TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 06/22/90 17:05:00 Category WATER

ANALYST: SWC FILE #: 0627C13A
INSTRMT: HP_III INJECTED: 06/28/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	BQL	5.0
100-41-4	Ethylbenzene	BQL	5.0
108-88-3	Toluene	BQL	5.0
1330-20-7	Xylenes, Total	BQL	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

Received: 06/25/90

Results by Sample

SAMPLE ID **FD-2** FRACTION **02C** TEST CODE **M8100** NAME **Polyaromatic Hydrocarbons**
Date & Time Collected **06/22/90 17:05:00** Category **WATER**

ANALYST: EDG EXTRACTED: 06/29/90 FILE #: SAMPLE_9
INSTRMT: HP_II INJECTED: 07/07/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	1
208-96-8	Acenaphthylene	3	1
83-32-9	Acenaphthene	BDL	1
86-73-7	Fluorene	6	1
85-01-8	Phenanthrene	BDL	1
120-12-7	Anthracene	BDL	1
206-44-0	Fluoranthene	BDL	1
129-00-0	Pyrene	9	1
56-55-3	Benzo(a)anthracene	BDL	5
218-01-9	Chrysene	BDL	5
205-99-2	Benzo(b)fluoranthene	BDL	5
207-08-9	Benzo(k)fluoranthene	BDL	5
50-32-8	Benzo(a)pyrene	BDL	5
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5
53-70-3	Dibenzo(a,h)anthracene	BDL	5
191-24-2	Benzo(g,h,i)perylene	BDL	5

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

Results by Sample

SAMPLE ID MW-13 SAMPLE # 03 FRACTIONS: A,B,C
Date & Time Collected 06/22/90 Category WATER

TPH	<1
	mg/l

AMPLE ID **MW-13** FRACTION **03B** TEST CODE **BETXGC** NAME **Volatile Organics (BETX)**
Date & Time Collected **06/22/90** Category **WATER**

ANALYST: SWC FILE #: 0627C12A
INSTRMT: HP_III INJECTED: 06/28/90 FACTOR: 1 UNITS: ug/L VERIFIED

CAS#	COMPOUND	RESULT	DET LIMIT
71-43-2	Benzene	**BQL**	5.0
100-41-4	Ethylbenzene	**BQL**	5.0
108-88-3	Toluene	**BQL**	5.0
1330-20-7	Xylenes, Total	**BQL**	5.0

NOTES AND DEINITIONS FOR THIS REPORT.
DET LIMIT = DETECTION LIMIT
BDL= BELOW DETECTION LIMIT
BQL= BELOW QUANITATION LIMIT
NA = NOT ANALYZED

Results by Sample

AMPLE ID MW-13 FRACTION 03C TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 06/22/90 Category WATER

ANALYST: EDG EXTRACTED: 06/29/90 FILE #: SAMPLE_10
INSTRMT: HP_II INJECTED: 07/07/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	1
208-96-8	Acenaphthylene	BDL	1
83-32-9	Acenaphthene	BDL	1
86-73-7	Fluorene	BDL	1
85-01-8	Phenanthrene	BDL	1
120-12-7	Anthracene	BDL	1
206-44-0	Fluoranthene	BDL	1
129-00-0	Pyrene	7	1
56-55-3	Benzo(a)anthracene	BDL	5
218-01-9	Chrysene	BDL	5
205-99-2	Benzo(b)fluoranthene	BDL	5
207-08-9	Benzo(k)fluoranthene	BDL	5
50-32-8	Benzo(a)pyrene	BDL	5
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	5
53-70-3	Dibenzo(a,h)anthracene	BDL	5
191-24-2	Benzo(g,h,i)perylene	BDL	5

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID **POND-2** SAMPLE # **04** FRACTIONS: **A**
Date & Time Collected **06/22/90 17:30:00** Category **WATER**

TPH	**<1**	mg/l

SAMPLE ID **POND-1** SAMPLE # **05** FRACTIONS: **A**
Date & Time Collected **06/22/90** Category **WATER**

TPH	**<1**	mg/l

Test Methodology

'EST CODE **BETXGC** NAME **Volatile Organics (BETX)**

:PA Method 8020 (SW-846)

'EST CODE **M8100** NAME **Polyaromatic Hydrocarbons**

:PA Method 8100 SW-846

'EST CODE **TPH** NAME **Petroleum Hydrocarbons**

:PA Method 418.1

Kemron
ENVIRONMENTAL SERVICES

№ 19647

CHAIN-OF-CUSTODY RECORD

Project Contact: Kurt Hausner

Turn Around Requirements: Normal

I will call Monday (6/25/90) to transmit Prices agreed on earlier

Project No.: 819-300

Project Name: Chicora Tank Farm

Sampler (print): Kurt D. Hausner, Greg A. Beck

Signature: Greg A. Beck

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location	NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-P.P.L.	TOT. METALS-RCRA	PCBs	PESTICIDES	TPH	BETX	PHENOLICS	PAH	ADDITIONAL REQUIREMENTS
FD-1		✓	6/22	1200	FD-1	1											✓	✓				
FD-2		✓	6/22	1205	FD-2	5											✓	✓	✓	✓		
MW-13		✓	6/22		MW-13	5											✓	✓		✓		
POND-2		✓	6/22	1230	POND-2	1											✓					
POND-1		✓	6/22	0910	POND-1	1											✓					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Greg A. Beck	6/22	1900					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			DDHill	6/25/90	2020	

eceived: 08/17/90 08/21/90 13:33:23

REPORT TO: Wapora, Inc.
1815 Century Blvd.
Suite 150
Atlanta,GA 30345
ATTEN Kurt Hausner

CLIENT WAPATL 59227 SAMPLES 4
COMPANY Wapora, Inc.
ACILITY Atlanta
FAX # (404) 636-7162

WORK ID 819-300Navy Chicora Tank Farm
TAKEN K.Hausner
TRANS Fed Ex
TYPE
P.O. #
INVOICE under separate cover

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

CERTIFIED BY

ATTEN
PHONE (614) 373-4071 CONTACT G CROSS

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

SAMPLE IDENTIFICATION

1 FD 1-S
2 FD 1-W
3 FD 1-E
4 FD 2-S

TEST CODES and NAMES used on this workorder

TPH Petroleum Hydrocarbons

kemron

SAMPLE ID FD 1-S SAMPLE # 01 FRACTIONS: A
Date & Time Collected 08/16/90 07:15:00 Category WATER

TPH	<1	mg/L

SAMPLE ID FD 1-W SAMPLE # 02 FRACTIONS: A
Date & Time Collected 08/16/90 07:30:00 Category WATER

TPH	<1	mg/L

SAMPLE ID FD 1-E SAMPLE # 03 FRACTIONS: A
Date & Time Collected 08/16/90 07:45:00 Category WATER

TPH	<1	mg/L

SAMPLE ID FD 2-S SAMPLE # 04 FRACTIONS: A
Date & Time Collected 08/16/90 08:00:00 Category WATER

TPH	<1	mg/L

Test Methodology

TEST CODE TPH NAME Petroleum Hydrocarbons

EPA Method 418.1

Kemron
ENVIRONMENTAL SERVICES

№ 1

CHAIN-OF-CUSTODY RECORD

Project Contact: Kurt Hausner

Turn Around Requirements: Normal ([redacted] TAT turnaround if possible)

Page 1 of 1

Project No.: 819-300

Project Name: Navy - Chicora Tank Farm

Sampler (print): Kurt Hausner, Emil Beshara

Signature: Kurt Hausner, Emil Beshara

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location	NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-PPL.	TOT. METALS-RCRA	PCBs	PESTICIDES	TPH	BETX	PHENOLICS	PAH	ADDITIONAL REQUIREMENTS
FD1-S		✓	8/16	0715	FD1-S	2												✓				
FD1-W		✓	"	0730	FD1-W	2												✓				
FD1-E		✓	"	0745	FD1-E	2												✓				
FD2-S		✓	"	0800	FD2-S	2												✓				

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Kurt Hausner	10/16/90	1700					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Janet Williams	8/17		(1) Per Kurt Hausner 8-17-90 14:07 Do not run PAH's we may dispose of samples. BWC

KEMRON REPORT Work Order # N0-..-199
Received: 08/17/90
08/23/90 15:54:04

REPORT TO: Wapora, Inc.
1815 Century Blvd.
Suite 150
Atlanta,GA 30345
ATTEN: Kurt Hausner

CLIENT: WAPATL 59227 SAMPLES: 3
COMPANY: Wapora, Inc.
FACILITY: Atlanta
FAX # (404) 636-7162

WORK ID: 819-300Navy Chicora Tank Farm
TAKEN: K.Hausner
TRANS: Fed Ex
TYPE:
P.O. #:
INVOICE: under separate cover

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

L Burris
CERTIFIED BY

ATTEN:
PHONE: (614) 373-4071
CONTACT: G CROSS

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

SAMPLE IDENTIFICATION

01 FD 2-W
02 FD 3-S
03 FD 3-E

TEST CODES and NAMES used on this workorder

M8100 Polyaromatic Hydrocarbons
TPH Petroleum Hydrocarbons

Kemron ENVIRONMENTAL SERVICES

SAMPLE ID FD 2-W SAMPLE # 01 FRACTIONS: A,B
Date & Time Collected 08/18/90 08:10:00 Category WATER

TPH	2	mg/L

Received: 08/17/90 Results by Sample

SAMPLE ID FD 2-W FRACTION 01B TEST CODE M8100 NAME Polyaromatic Hydrocarbons
Date & Time Collected 08/18/90 08:10:00 Category WATER

ANALYST: EDG EXTRACTED: 08/20/90 FILE #: SAMPLE_9
INSTRMT: HP_II INJECTED: 08/23/90 FACTOR: 10 UNITS: ug/L

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	BDL	10
208-96-8	Acenaphthylene	BDL	10
83-32-9	Acenaphthene	BDL	10
86-73-7	Fluorene	BDL	10
85-01-8	Phenanthrene	BDL	10
120-12-7	Anthracene	BDL	10
206-44-0	Fluoranthene	BDL	10
129-00-0	Pyrene	BDL	10
56-55-3	Benzo(a)anthracene	BDL	50
218-01-9	Chrysene	BDL	50
205-99-2	Benzo(b)fluoranthene	BDL	50
207-08-9	Benzo(k)fluoranthene	BDL	50
50-32-8	Benzo(a)pyrene	BDL	50
193-39-5	Indeno(1,2,3-cd)pyrene	BDL	50
53-70-3	Dibenzo(a,h)anthracene	BDL	50
191-24-2	Benzo(g,h,i)perylene	BDL	50

VERIFIED: RJW

NOTES AND DEFINITIONS FOR THIS REPORT
DET LIMIT = DETECTION LIMIT
BDL = BELOW DETECTION LIMIT
NA = NOT ANALYZED
NF = NOT FOUND
DL = DILUTED OUT

SAMPLE ID FD 3-B SAMPLE # 02 FRACTIONS: A
Date & Time Collected 08/16/90 09:00:00 Category WATER

TPH	240	mg/L

SAMPLE ID FD 3-E SAMPLE # 03 FRACTIONS: A
Date & Time Collected 08/16/90 09:45:00 Category WATER

TPH	470	mg/L

Test Methodology

TEST CODE M8100 NAME Polyaromatic Hydrocarbons

EPA Method 8100 SW-846

TEST CODE TPH NAME Petroleum Hydrocarbons

EPA Method 418.1

Kemron
ENVIRONMENTAL SERVICES

№

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: Kurt HAUSNER

Turn Around Requirements: Normal (UST if Possible)

Project No.: 819-300

Project Name: Navy Chicora Tank Farm

Sampler (print): Kurt HAUSNER, Emil Beshara

Signature: Kurt Hausner, Emil Beshara

Sample I.D. No.	Comp	Grab	Date	Time	Sample Location	NUMBER OF SAMPLES	HOLD	% SOLIDS	VOA	ACID EXTRACT.	BASE/NEUTR. EXT.	EP TOX.-METALS	EP TOX.-ORGAN.	TOT. METALS-P.P.L.	TOT. METALS-RCRA	PCBs	PESTICIDES	TPH	BETX	PHENOLICS	PAH	ADDITIONAL REQUIREMENTS
FD2-W		✓	8/16	0810	FD2-W	2												✓		✓		(1)
FD3-S		✓	"	0900	FD3-S	4												✓		✓		
FD3-E		✓	"	0945	FD3-E	4												✓		✓		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Kurt Hausner	8/16/90	1700					
Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks: (1) per Kurt Hausner 8/17/90 14:01 Analyses PAH on FD2-W (Downgrade gradient specific) FD3-S & E PAH samples. TPH for samples above 6NC.			
			Janet Williams	8/17					

WADS

White - Lab Yellow - Office Pink - Field

HYDE BROS PRTG CO MARIETTA, OHIO 45750 304 374-48

Received: 08/21/90 08/27/90 11:30:35

REPORT TO: Wapora, Inc.
1815 Century Blvd.
Suite 150
Atlanta,GA 30345
ATTEN: Kurt Hausner

CLIENT: WAPATL 59227 SAMPLES: 1
COMPANY: Wapora, Inc.
FACILITY: Atlanta
FAX # (404) 636-7162

WORK ID: 819-300/Chicora Tk. Farm
TAKEN: Hausner/Stovall
TRANS: Fed Ex
TYPE:
P.O. #:
INVOICE: under separate cover

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

CERTIFIED BY

ATTEN:
PHONE: (614) 373-4071 CONTACT: G CROSS

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

SAMPLE IDENTIFICATION	TEST CODES and NAMES used on this workorder
01 FD2-W	BETXGC Volatile Organics (BETX)

KEMRON ENVIRONMENTAL SERVICES

SAMPLE ID FD2-W FRACTION 01A TEST CODE BETXGC NAME Volatile Organics (BETX)
Date & Time Collected 08/16/90 12:00:00 Category WATER

ANALYST: WSN FILE #: 3WA6670
INSTRMT: FINN_3 INJECTED: 08/23/90 FACTOR: 1 UNITS: ug/L

CAS#	COMPOUND	RESULT	PQL
71-43-2	Benzene	BQL *	5.0
100-41-4	Ethylbenzene	BQL *	5.0
108-88-3	Toluene	BQL *	5.0
1330-20-7	Xylenes, Total	BQL *	5.0

NOTES AND DEFINITIONS FOR THIS REPORT.
BQL= BELOW PRACTICAL QUANTITATION LIMIT (PQL)
NA = NOT ANALYZED
* = ANALYZED, USING METHOD 8240 BY GC/MS

QUALITY ASSURANCE SECTION

AND

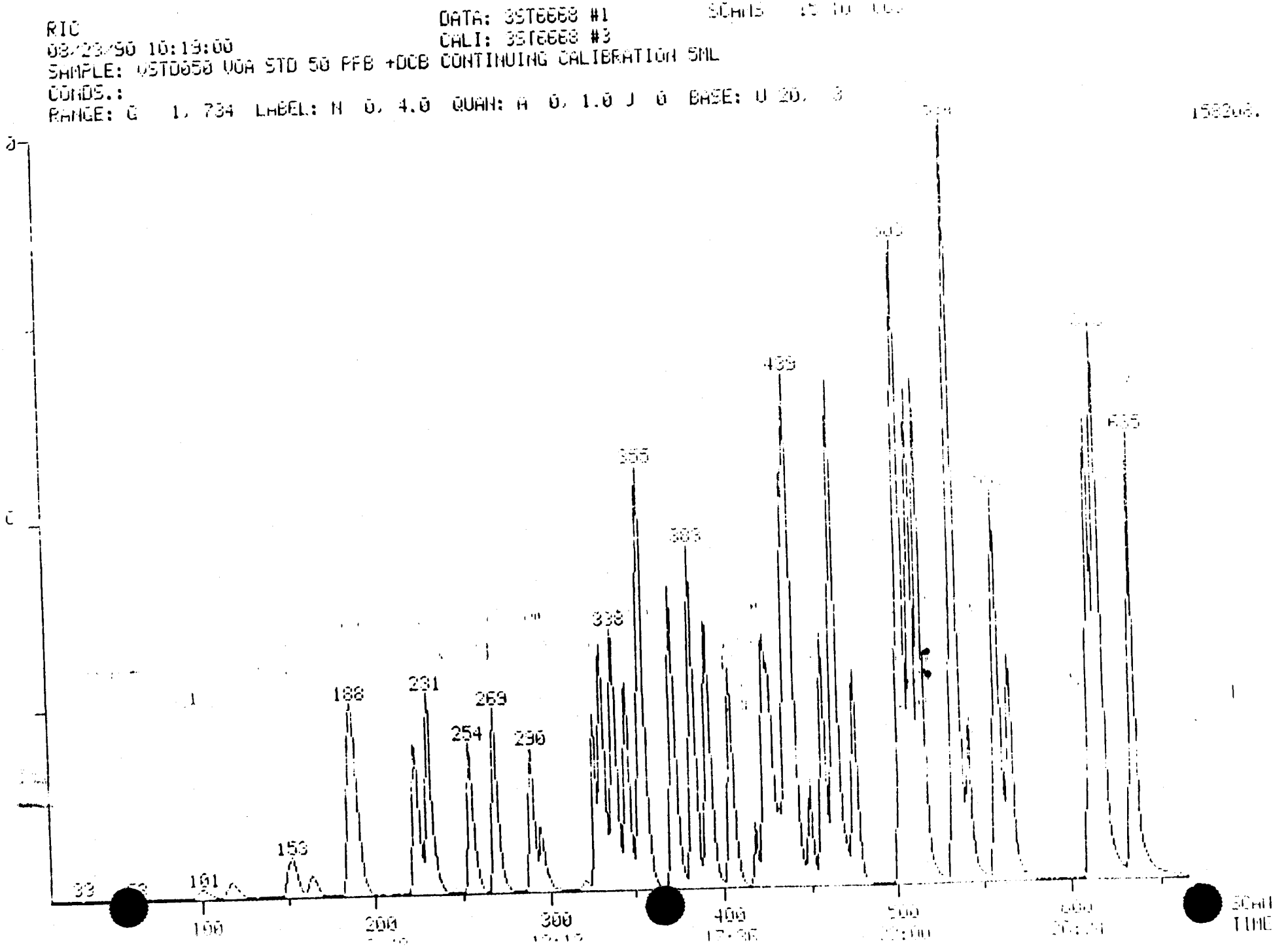
ATTACHMENTS

- BFB Summary-Method 624, 8240 (VOA)
- Method 624, 8240 (VOA) Standard RIC
- Method 624, 8240 (VOA) Blank RIC
- Method 624, 8240 (VOA) Sample RIC
- Mass Spectra - Identified VOA Compounds
- Glossary
- Chain-of-Custody Record
  (if initiated by client)

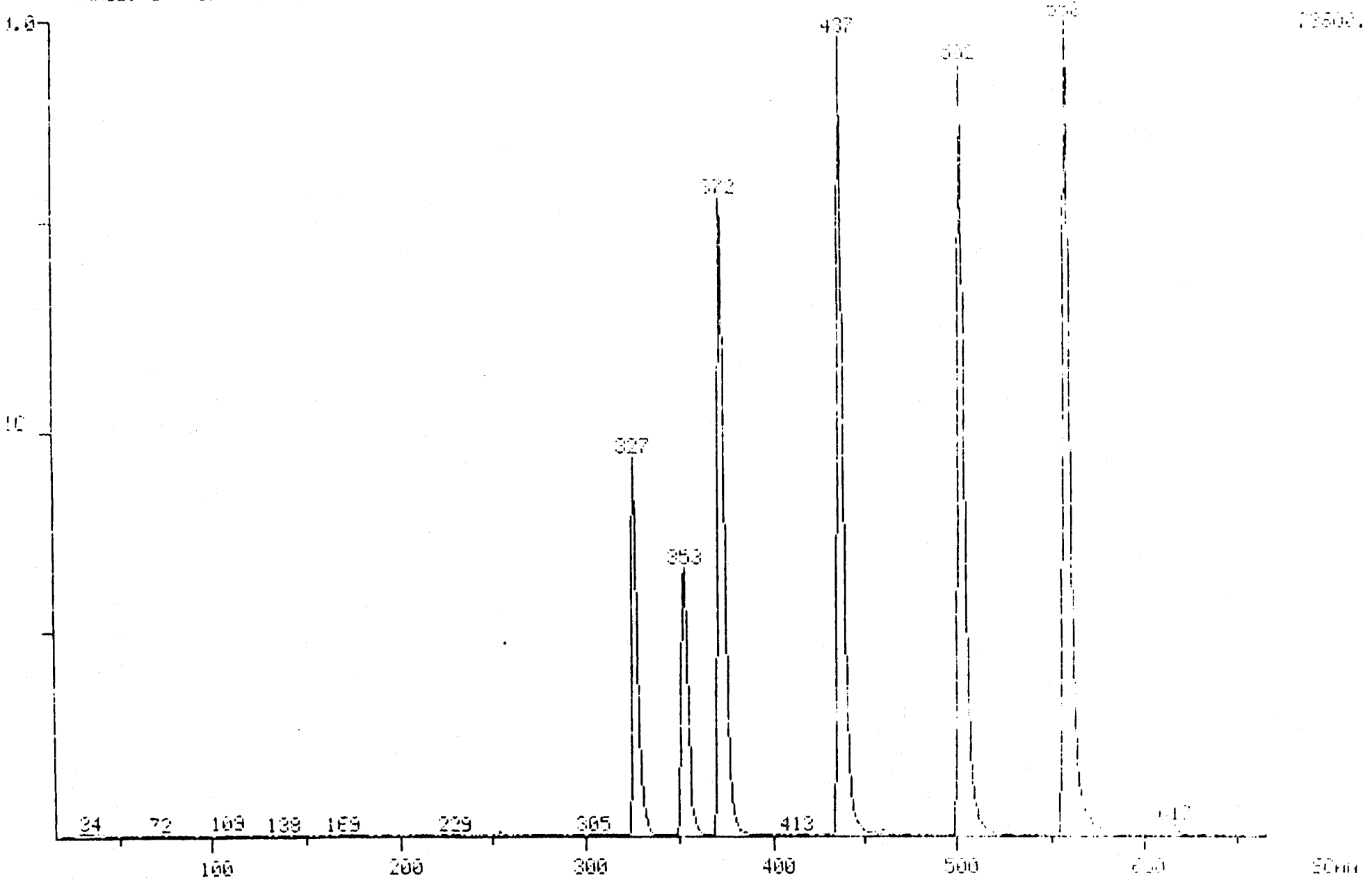
Tuning Report

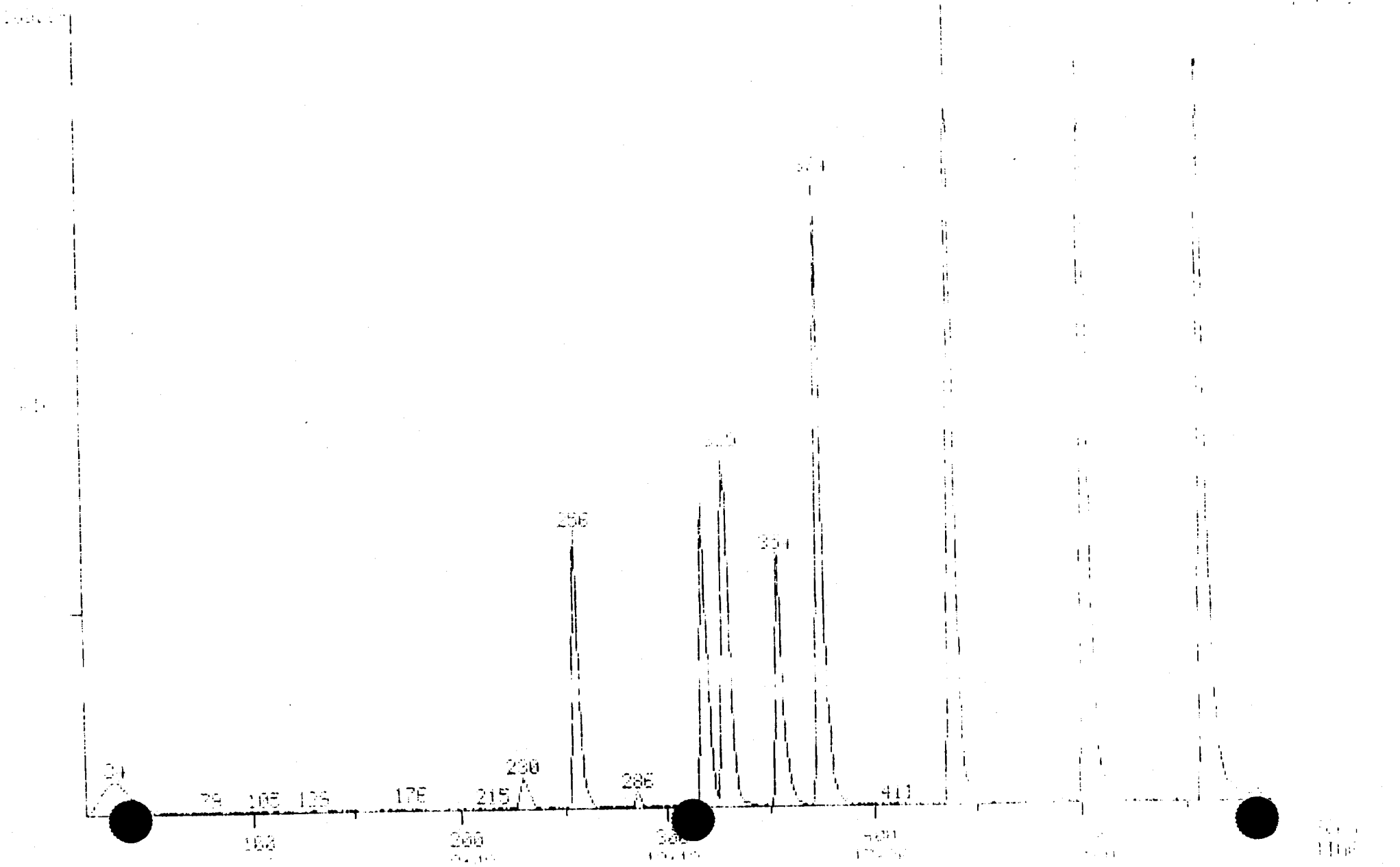
08/23/90 9:51:00 + 7:00 Cal: SCALOSIO # 3 RIC: 12000.
Instrument: FINN_3 Analyst: WSN Acct. No.:
Case Number: Laboratory: KLMRON # 2 Contract:

			Ion Abundance Criteria				
m/z	Intensity	% BA	Min %	Max %	Mass	Actual	Status
50	494.	16.0	15.0	40.0	95	16.0	PASS
75	1330.	43.0	30.0	60.0	95	43.0	PASS
95	3096.	100.0	100.0	---	---	100.0	PASS
96	199.	6.4	5.0	9.0	95	6.4	PASS
173	0.	0.0	---	1.0	174	0.0	PASS
174	2240.	72.4	50.0	---	95	72.4	PASS
175	178.	5.7	5.0	9.0	174	7.9	PASS
176	2256.	72.9	95.0	101.0	174	100.7	PASS
177	137.	4.4	5.0	9.0	176	6.1	PASS


RIC
08/23/90 10:13:00
SAMPLE: VSTD050 VOA STD 50 PPB +DCB CONTINUING CALIBRATION SML
CONDS.:
RANGE: G 1, 734 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3
DATA: 3ST0668 #1
CALI: 3ST0668 #3
153
188
231
254
269
290
338
355
385
439
TIME

RIC DATA: 8BK6669 #1 SCANS 15 TO
08/23/90 11:17:00 CALI: 8BK6669 #3
SAMPLE: VBLK0823 VOA BLANK SML
CONDS.:
RANGE: G 1, 734 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3




256
331
290
286
24
79
105
126
175
215
411
100
200
300

GLOSSARY

BFB:	Bromoflurorbenzene; the compound specified in EPA Method 624/8240 for which the mass spectrometer must meet performance criteria for VOA analysis.
DFTPP:	Decafluorotriphenylphosphine; the compound specified in EPA Method 625/8270 for which the mass spectrometer must meet performance criteria for semivolatile compounds.
EPA Method 624:	GC/MS method for determining volatile organic compounds in water using the purge and trap technique.
EPA Method 625:	GC/MS method for determining semivolatile organic compounds in water using liquid/liquid extraction.
EPA Method 8240:	GC/MS Method for determining volatile organic compounds in a variety of water and waste matrices using the purge and trap technique. Reference: SW-846.
EPA Method 8270:	GC/MS Method for determining semivolatile organic compounds in a variety of water and waste matrices using liquid/liquid extraction and capillary column technique. Reference: SW-846.
IS:	Internal Standard: compound used to determine response factors (RF) for individual analytes and subsequent quantitative analysis.
RIC:	Reconstructed Ion Chromatograph; GC/MS chromatograph which plots total ion current versus scan number (time).
SS:	Surrogate Standard; quality control compounds similar to the compounds of interest which are spiked into every sample matrix. The surrogate's recovery is determined using the same internal standard procedures and the analytes.
VOA:	Volatile Organic Analysis; see EPA Method 624/8240.
SV:	Semivolatile compounds; refers to the analytes determined by liquid/liquid extraction technique Method 625/8270.

KEMRON ENVIRONMENTAL SERVICES

CHAIN OF CUSTODY RECORD

16550 Highland Road
Baton Rouge, Louisiana 70810
(504) 293-8650

PROJ. NO. 819-300 | PROJECT NAME Chicora Tank Farm

SAMPLERS: (Signature) Hausner / Stovall

STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION	NO. OF CONTAINERS	BTEX	REMARKS
FD2-W	8/16/10	1200		✓	—	3		UST. Turnaround if possible otherwise standard

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
R. Stovall	8/20/10 1400				
Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
Relinquished by:	Date/Time	Received for Laboratory By (Signature)	Date/Time	Remarks	
		DDahill	8/21/10 1720		

Distribution: White - Accompanies Shipment; Pink - Coordinator Field Files; Yellow - Lab File

APPENDIX C
First Quarter Groundwater and Soil Laboratory Results, March 1993

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Andrew Clark
Invoice Number:

Order #: N3-03-281
Date: 04/08/93 14:08
Work ID: 6544/Navy-Chicora Tank Farm
Date Received: 03/18/93
Date Completed: 04/08/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	Sed. 1
02	Sed. 2
03	Sed. 3
04	Sed. 4
05	Sed. 5
06	Sed. 6
07	Sed. 7
08	Sed. 8
09	Sed. 9

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample: 01B Sed. 1 **Collected: 03/17/93 Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	71	1	% wt.	03/29/93	JEC
Petroleum Hydrocarbons	<25	25	mg/kg	03/26/93	MDC

Sample: 02B Sed. 2 **Collected: 03/17/93 Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	46	1	% wt.	03/29/93	JEC
Petroleum Hydrocarbons	1200	25	mg/kg	03/26/93	MDC

Sample: 03B Sed. 3 **Collected: 03/17/93 Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	30	1	% wt.	03/29/93	JEC
Petroleum Hydrocarbons	260	25	mg/kg	03/26/93	MDC

Sample: 04B Sed. 4 **Collected: 03/17/93 Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	48	1	% wt.	03/29/93	JEC
Petroleum Hydrocarbons	140	25	mg/kg	03/26/93	MDC

Sample: 05B Sed. 5 **Collected: 03/17/93 Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	63	1	% wt.	03/29/93	JEC
Petroleum Hydrocarbons	<25	25	mg/kg	03/26/93	MDC

Sample: 06B Sed. 6 **Collected: 03/17/93 Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	53	1	% wt.	03/29/93	JEC
Petroleum Hydrocarbons	170	25	mg/kg	03/26/93	MDC

Sample: 07B Sed. 7 **Collected: 03/17/93 Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	32	1	% wt.	03/29/93	JEC

Test Description	Result	Det Limit	Units	Analyzed	By
Petroleum Hydrocarbons	610	25	mg/kg	03/26/93	MDC

Sample: 08B Sed. 8 **Collected: 03/17/93** **Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	73	1	% wt.	03/29/93	JEC
Petroleum Hydrocarbons	<25	25	mg/kg	03/26/93	MDC

Sample: 09B Sed. 9 **Collected: 03/17/93** **Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Percent Solids	61	1	% wt.	03/29/93	JEC
Petroleum Hydrocarbons	46	25	mg/kg	03/26/93	MDC

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 1** Collected: **03/17/93 10:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **01A** Category: **SOIL**

ANALYST: BAR FILE #: 004F0103
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 86 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **Sed. 1** Collected: **03/17/93 10:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 005F0101
INSTRMT: HP_II INJECTED: 04/02/93 FACTOR: 33 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	33
208-96-8	Acenaphthylene	ND	33
83-32-9	Acenaphthene	ND	33
86-73-7	Fluorene	ND	33
85-01-8	Phenanthrene	ND	33
120-12-7	Anthracene	ND	33
206-44-0	Fluoranthene	ND	33
129-00-0	Pyrene	ND	33
56-55-3	Benzo(a)anthracene	ND	160
218-01-9	Chrysene	ND	160
205-99-2	Benzo(b)fluoranthene	ND	160
207-08-9	Benzo(k)fluoranthene	ND	160
50-32-8	Benzo(a)pyrene	ND	160
193-39-5	Indeno(1,2,3-cd)pyrene	ND	160
53-70-3	Dibenzo(a,h)anthracene	ND	160
191-24-2	Benzo(g,h,i)perylene	ND	160

SURROGATES

2-methyl-naphthalene	76 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

TEST RESULTS BY SAMPLE

Sample Description: **Sed. 2** Collected: **03/17/93 10:05** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02A** Category: **SOIL**

ANALYST: BAR FILE #: 009F0101
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**9**	5.0

SURROGATES

a,a,a-trifluorotoluene 61 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 2** Collected: **03/17/93 10:05** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 008F0101
INSTRMT: HP_II INJECTED: 04/01/93 FACTOR: 330 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	330
208-96-8	Acenaphthylene	ND	330
83-32-9	Acenaphthene	ND	330
86-73-7	Fluorene	ND	330
85-01-8	Phenanthrene	ND	330
120-12-7	Anthracene	ND	330
206-44-0	Fluoranthene	ND	330
129-00-0	Pyrene	ND	330
56-55-3	Benzo(a)anthracene	ND	1600
218-01-9	Chrysene	ND	1600
205-99-2	Benzo(b)fluoranthene	ND	1600
207-08-9	Benzo(k)fluoranthene	ND	1600
50-32-8	Benzo(a)pyrene	ND	1600
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1600
53-70-3	Dibenzo(a,h)anthracene	ND	1600
191-24-2	Benzo(g,h,i)perylene	ND	1600

SURROGATES
2-methyl-naphthalene 162 * % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
* = SAMPLE MATRIX INTERFERENCE

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 3** Collected: **03/17/93 10:10** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03A** Category: **SOIL**

ANALYST: BAR FILE #: 010F0101
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	53 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **Sed. 3** Collected: **03/17/93 10:10** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 010F0101
INSTRMT: HP_II INJECTED: 04/01/93 FACTOR: 330 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	330
208-96-8	Acenaphthylene	ND	330
83-32-9	Acenaphthene	ND	330
86-73-7	Fluorene	ND	330
85-01-8	Phenanthrene	ND	330
120-12-7	Anthracene	ND	330
206-44-0	Fluoranthene	ND	330
129-00-0	Pyrene	ND	330
56-55-3	Benzo(a)anthracene	ND	1600
218-01-9	Chrysene	ND	1600
205-99-2	Benzo(b)fluoranthene	ND	1600
207-08-9	Benzo(k)fluoranthene	ND	1600
50-32-8	Benzo(a)pyrene	ND	1600
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1600
53-70-3	Dibenzo(a,h)anthracene	ND	1600
191-24-2	Benzo(g,h,i)perylene	ND	1600

SURROGATES
2-methyl-naphthalene 60 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 4** Collected: **03/17/93 10:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04A** Category: **SOIL**

ANALYST: BAR FILE #: 011F0101
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 78 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 4** Collected: **03/17/93 10:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 012F0101
INSTRMT: HP_II INJECTED: 04/01/93 FACTOR: 330 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	330
208-96-8	Acenaphthylene	ND	330
83-32-9	Acenaphthene	ND	330
86-73-7	Fluorene	ND	330
85-01-8	Phenanthrene	ND	330
120-12-7	Anthracene	ND	330
206-44-0	Fluoranthene	ND	330
129-00-0	Pyrene	ND	330
56-55-3	Benzo(a)anthracene	ND	1600
218-01-9	Chrysene	ND	1600
205-99-2	Benzo(b)fluoranthene	ND	1600
207-08-9	Benzo(k)fluoranthene	ND	1600
50-32-8	Benzo(a)pyrene	ND	1600
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1600
53-70-3	Dibenzo(a,h)anthracene	ND	1600
191-24-2	Benzo(g,h,i)perylene	ND	1600

SURROGATES
2-methyl-naphthalene 73 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 5** Collected: **03/17/93 10:20** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05A** Category: **SOIL**

ANALYST: BAR FILE #: 012F0101
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 72 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 5** Collected: **03/17/93 10:20** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 007F0301
INSTRMT: HP_II INJECTED: 04/02/93 FACTOR: 33 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	33
208-96-8	Acenaphthylene	ND	33
83-32-9	Acenaphthene	ND	33
86-73-7	Fluorene	39	33
85-01-8	Phenanthrene	ND	33
120-12-7	Anthracene	ND	33
206-44-0	Fluoranthene	ND	33
129-00-0	Pyrene	ND	33
56-55-3	Benzo(a)anthracene	ND	160
218-01-9	Chrysene	ND	160
205-99-2	Benzo(b)fluoranthene	ND	160
207-08-9	Benzo(k)fluoranthene	ND	160
50-32-8	Benzo(a)pyrene	ND	160
193-39-5	Indeno(1,2,3-cd)pyrene	ND	160
53-70-3	Dibenzo(a,h)anthracene	ND	160
191-24-2	Benzo(g,h,i)perylene	ND	160

SURROGATES
2-methyl-naphthalene 60 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 6** Collected: **03/17/93 10:25** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06A** Category: **SOIL**

ANALYST: BAR FILE #: 015F0101
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 72 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

TEST RESULTS BY SAMPLE

Sample Description: **Sed. 6** Collected: **03/17/93 10:25** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 019F0101
INSTRMT: HP_II INJECTED: 04/02/93 FACTOR: 330 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	330
208-96-8	Acenaphthylene	ND	330
83-32-9	Acenaphthene	ND	330
86-73-7	Fluorene	ND	330
85-01-8	Phenanthrene	ND	330
120-12-7	Anthracene	ND	330
206-44-0	Fluoranthene	ND	330
129-00-0	Pyrene	ND	330
56-55-3	Benzo(a)anthracene	ND	1600
218-01-9	Chrysene	ND	1600
205-99-2	Benzo(b)fluoranthene	ND	1600
207-08-9	Benzo(k)fluoranthene	ND	1600
50-32-8	Benzo(a)pyrene	ND	1600
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1600
53-70-3	Dibenzo(a,h)anthracene	ND	1600
191-24-2	Benzo(g,h,i)perylene	ND	1600

SURROGATES

2-methyl-naphthalene 51 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 7** Collected: **03/17/93 10:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07A** Category: **SOIL**

ANALYST: BAR FILE #: 016F0101
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	81 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 7** Collected: **03/17/93 10:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 021F0101
INSTRMT: HP_II INJECTED: 04/02/93 FACTOR: 330 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	330
208-96-8	Acenaphthylene	ND	330
83-32-9	Acenaphthene	ND	330
86-73-7	Fluorene	ND	330
85-01-8	Phenanthrene	ND	330
120-12-7	Anthracene	ND	330
206-44-0	Fluoranthene	ND	330
129-00-0	Pyrene	ND	330
56-55-3	Benzo(a)anthracene	ND	1600
218-01-9	Chrysene	ND	1600
205-99-2	Benzo(b)fluoranthene	ND	1600
207-08-9	Benzo(k)fluoranthene	ND	1600
50-32-8	Benzo(a)pyrene	ND	1600
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1600
53-70-3	Dibenzo(a,h)anthracene	ND	1600
191-24-2	Benzo(g,h,i)perylene	ND	1600

SURROGATES

2-methyl-naphthalene	124 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 8** Collected: **03/17/93 10:35** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08A** Category: **SOIL**

ANALYST: BAR FILE #: 017F0101
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 88 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 8** Collected: **03/17/93 10:35** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **08B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 010F0301
INSTRMT: HP_II INJECTED: 04/02/93 FACTOR: 33 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	33
208-96-8	Acenaphthylene	ND	33
83-32-9	Acenaphthene	ND	33
86-73-7	Fluorene	ND	33
85-01-8	Phenanthrene	ND	33
120-12-7	Anthracene	ND	33
206-44-0	Fluoranthene	ND	33
129-00-0	Pyrene	ND	33
56-55-3	Benzo(a)anthracene	ND	160
218-01-9	Chrysene	ND	160
205-99-2	Benzo(b)fluoranthene	ND	160
207-08-9	Benzo(k)fluoranthene	ND	160
50-32-8	Benzo(a)pyrene	ND	160
193-39-5	Indeno(1,2,3-cd)pyrene	ND	160
53-70-3	Dibenzo(a,h)anthracene	ND	160
191-24-2	Benzo(g,h,i)perylene	ND	160

SURROGATES

2-methyl-naphthalene	69 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Sed. 9** Collected: **03/17/93 10:40** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **09A** Category: **SOIL**

ANALYST: BAR FILE #: 018F0101
INSTRMT: HP_III INJECTED: 03/22/93 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**7**	5.0

SURROGATES
a,a,a-trifluorotoluene 68 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **Sed. 9** Collected: **03/17/93 10:40** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **09B** Category: **SOIL**

ANALYST: HV EXTRACTED: 03/30/93 FILE #: 011F0301
INSTRMT: HP_II INJECTED: 04/02/93 FACTOR: 33 UNITS: ug/kg VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	33
208-96-8	Acenaphthylene	ND	33
83-32-9	Acenaphthene	ND	33
86-73-7	Fluorene	ND	33
85-01-8	Phenanthrene	ND	33
120-12-7	Anthracene	ND	33
206-44-0	Fluoranthene	ND	33
129-00-0	Pyrene	ND	33
56-55-3	Benzo(a)anthracene	ND	160
218-01-9	Chrysene	ND	160
205-99-2	Benzo(b)fluoranthene	ND	160
207-08-9	Benzo(k)fluoranthene	ND	160
50-32-8	Benzo(a)pyrene	ND	160
193-39-5	Indeno(1,2,3-cd)pyrene	ND	160
53-70-3	Dibenzo(a,h)anthracene	ND	160
191-24-2	Benzo(g,h,i)perylene	ND	160

SURROGATES
2-methyl-naphthalene 73 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Percent Solids
EPA Method 160.3 - Gravimetric, Dried at 103-105 Degrees C
To convert test results to "Dry Weight Basis" use this formula:

$$\text{RESULT (DRY WT.)} = \frac{\text{RESULT (REPORTED)} \times 100}{\text{PERCENT SOLIDS}}$$

EPA Method 3550/418.1 - Total Petroleum Hydrocarbons (IR)

SW-846 Method 8100 - Polyaromatic Hydrocarbons

EPA Method 602/SW8020 GC/PID Volatile Aromatics

Kerr-McGee
ENVIRONMENTAL SERVICES

No 56568

CHAIN-OF-CUSTODY RECORD

Project Contact: Andrew Clark

Turn Around Requirements: 3 weeks

Project No.: 6544

Project Name: Navy - Chiora Tank Farm

Sampler (print): Cord Lomauro ~~Bobbins~~

Signature: [signature]

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	TPH (418.1)	BTEX (8020)	PAH (8100)	ADDITIONAL REQUIREMENTS
Sed. 1		✓	3/17/93	1000			2		✓	✓	✓	
Sed. 2		✓		1005			2		✓	✓	✓	
Sed. 3		✓		1010			2		✓	✓	✓	
Sed. 4		✓		1015			2		✓	✓	✓	
Sed. 5		✓		1020			2		✓	✓	✓	
Sed. 6		✓		1025			2		✓	✓	✓	
Sed. 7		✓		1030			2		✓	✓	✓	
Sed. 8		✓		1035			2		✓	✓	✓	
Sed. 9		✓	3/17/93	1040			2		✓	✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	1800	3/17/93					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			[signature] Linda Gregory	3/18/93	9:30	

*Homogenize all composite samples prior to analysis

White - Lab Yellow - Office Pink - Field

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Andrew Clark
Invoice Number:

Order #: N3-03-304
Date: 04/07/93 14:45
Work ID: 6544/Navy-Chicora Tank Farm
Date Received: 03/19/93
Date Completed: 04/07/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	Field Blank
02	Equip. Rinse
03	MW 5
04	FD -3
05	Trip Blank

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Leslie Bucina
Certified By
Leslie Bucina

kemron
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample: 03A MW 5 **Collected: 03/16/93** **Category: WATER**
Job: MET8 RCRA Metals - Water

Test Description	Result	Det Limit	Units	Analyzed	By
Arsenic, Total	0.086	0.004	mg/L As	03/29/93	JKM
Barium, Total	0.13	0.01	mg/L Ba	04/01/93	PNW
Cadmium, Total	<0.01	0.01	mg/L Cd	04/01/93	PNW
Chromium, Total	0.04	0.02	mg/L Cr	04/01/93	PNW
Lead, Total	<0.005	0.005	mg/L Pb	03/23/93	TAS
Mercury, Total	0.0003	0.0002	mg/L Hg	03/25/93	JBC
Selenium, Total	<0.004	0.004	mg/L Se	03/29/93	JKM
Silver, Total	<0.01	0.01	mg/L Ag	04/01/93	PNW

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Field Blank** Collected: **03/17/93 09:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01A** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 014F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 40 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Equip. Rinse** Collected: **03/17/93 09:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02A** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 015F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	31 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Equip. Rinse** Collected: **03/17/93 09:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02B** Category: **WATER**

ANALYST: BAR FILE #: 011F0101
INSTRMT: HP_III INJECTED: 03/21/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 92 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD -3** Collected: **03/18/93 15:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04A** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 005F0101
INSTRMT: HP_II INJECTED: 04/01/93 FACTOR: 100 * UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	100
208-96-8	Acenaphthylene	ND	100
83-32-9	Acenaphthene	ND	100
86-73-7	Fluorene	ND	100
85-01-8	Phenanthrene	ND	100
120-12-7	Anthracene	ND	100
206-44-0	Fluoranthene	ND	100
129-00-0	Pyrene	ND	100
56-55-3	Benzo(a)anthracene	ND	500
218-01-9	Chrysene	ND	500
205-99-2	Benzo(b)fluoranthene	ND	500
207-08-9	Benzo(k)fluoranthene	ND	500
50-32-8	Benzo(a)pyrene	ND	500
193-39-5	Indeno(1,2,3-cd)pyrene	ND	500
53-70-3	Dibenzo(a,h)anthracene	ND	500
191-24-2	Benzo(g,h,i)perylene	ND	500

SURROGATES
2-methyl-naphthalene 672 ** % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
* = ELEVATED DETECTION LIMIT DUE TO SAMPLE MATRIX
** = SAMPLE MATRIX INTERFERENCE

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD -3** Collected: **03/18/93 15:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04B** Category: **WATER**

ANALYST: BAR FILE #: 012F0101
INSTRMT: HP_III INJECTED: 03/21/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 91 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **Trip Blank** Collected: **03/17/93** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05A** Category: **WATER**

ANALYST: BAR FILE #: 013F0101
INSTRMT: HP_III INJECTED: 03/21/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 117 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST METHODOLOGIES

SW-846 Method 8100 - Polyaromatic Hydrocarbons

EPA Method 602/SW8020 GC/PID Volatile Aromatics

EPA Method 200.7 (ICP) - Silver

EPA Method 206.3/SW7061 (AA Vapor Hydride) - Arsenic

EPA Method 200.7/SW6010 (ICP) - Barium

EPA Method 200.7/SW6010 (ICP) - Cadmium

EPA Method 200.7/SW6010 (ICP) - Chromium, Total

EPA Method 245.1/SW7470 (Cold Vapor) - Mercury

EPA Method 239.2/SW7421 (GFAA) - Lead

EPA Method 270.3/SW7741 (Vapor Hydride) - Selenium

EPA Method SW3005 - Metals Digestion

KEMRON ANALYST LIST

Ohio Valley Laboratory

03/12/93

BAR - - Beth A. Raper
CAG - - C. Arthur Gray III
CAK - - Cheryl A. Koelsch
CEB - - Chad E. Barnes
DAM - - Dan A. Musgrave
DAR - - Dave A. Reed
DCP - - Daniel C. Peders
DEH - - Doug E. Hesson
DIH - - Deanna I. Hesson
DST - - Dennis S. Tepe
ECL - - Eric C. Lawson
EDG - - Eric D. Gerkin
FEH - - Fay E. Harmon
FRM - - Fred R. Montgomery
GSS - - Greg S. Smith
HV - - Hema Vilasagar
JAS - - Juanna A. Schafer
JBC - - Jim B. Crawford
JEC - - Jesse E. Chapman
JKM - - June K. Morris
JLH - - Janice L. Holland
JOD - - Julia O. Dodd
JWR - - John W. Richards
KHA - - Kim H. Archer
KMM - - Kevin M. McDonald
KPO - - Kevin P. Overstreet
LSB - - Leslie S. Bucina
MAH - - Mary A. Haider
MBJ - - Matthew B. Jarrell
MDC - - Michael D. Cochran
MMB - - Maren M. Burchfield
PDL - - Patricia D. Lane
PNW - - Phillip N. Wright
REB - - Russell E. Burton
RKA - - Robert K. Archer
RWC - - Rodney W. Campbell
SDF - - Scott D. Frum
SLM - - Stephanie L. Mossburg
SMC - - Susan M. Cunningham
SPL - - Steve P. Learn
TAS - - Tamela A. Sams
TLD - - Teresa L. Davis
WCD - - Wade C.Dawson

Kemron
ENVIRONMENTAL SERVICES

№ 6561

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: 3 weeks

Project No.: 6544

Project Name: NAVY - Chicora Tank Farm

Sampler (print): Cord Lomauro

Signature: Cord Lomauro

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	PAH (8100)	BTEX (8020)	RCRA metals	ADDITIONAL REQUIREMENTS
Field Blank			3/17/93	945			4		✓	✓		
Equip. Rinse		✓	3/17/93	930			4		✓	✓		
MW 5		✓	3/16/93	1040			1				✓	
FD-3		✓	3/18/93	1500			4		✓	✓		
Trip Blank			~~3/18/93~~ 3/17/93	~~1330~~			2			✓		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Cord Lomauro	3/18/93	1700					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Jodi Stanley	3/19/93	0915	

*Homogenize all co[illegible] samples prior to analysis

White – Lab – Office Pink – Field

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Andrew Clark
Invoice Number:

Order #: N3-03-282
Date: 04/05/93 12:25
Work ID: 6544/Navy-Chicora Tank Farm
Date Received: 03/18/93
Date Completed: 04/05/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	FD-1/A
02	FD-1/B
03	FD-1/C
04	FD-1/D
05	MW-3
06	MW-11
07	FD-2/A
08	FD-2/B
09	FD-2/C

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/A** Collected: **03/17/93 15:40** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **01A** Category: **WATER**

ANALYST: BAR FILE #: 018F0101
INSTRMT: HP_III INJECTED: 03/19/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 99 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/A** Collected: **03/17/93 15:40** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 005F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 49 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/B** Collected: **03/17/93 15:50** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02A** Category: **WATER**

ANALYST: BAR FILE #: 019F0101
INSTRMT: HP_III INJECTED: 03/19/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	95 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/B** Collected: **03/17/93 15:50** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 006F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	60 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/C** Collected: **03/17/93 16:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03A** Category: **WATER**

ANALYST: BAR FILE #: 020F0101
INSTRMT: HP_III INJECTED: 03/19/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 99 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: FD-1/C Collected: 03/17/93 16:00 Method: 8100
Test Description: Polyaromatic Hydrocarbons Test Code: M8100 Lab No: 03B Category: WATER

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 007F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 34 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/D** Collected: **03/17/93 16:10** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04A** Category: **WATER**

ANALYST: BAR FILE #: 021F0101
INSTRMT: HP_III INJECTED: 03/19/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	95 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1/D** Collected: **03/17/93 16:10** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 008F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 69 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-3** Collected: **03/16/93 14:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05A** Category: **WATER**

ANALYST: BAR FILE #: 022F0101
INSTRMT: HP_III INJECTED: 03/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	115 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW-3** Collected: **03/16/93 14:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 009F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 59 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

TEST RESULTS BY SAMPLE

Sample Description: **MW-11** Collected: **03/16/93 15:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06A** Category: **WATER**

ANALYST: BAR FILE #: 006F0101
INSTRMT: HP_III INJECTED: 03/21/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	98 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

TEST RESULTS BY SAMPLE

Sample Description: **MW-11** Collected: **03/16/93 15:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 010F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	58 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **FD-2/A** Collected: **03/17/93 16:20** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07A** Category: **WATER**

ANALYST: BAR FILE #: 007F0101
INSTRMT: HP_III INJECTED: 03/21/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-2/A** Collected: **03/17/93 16:20** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 012F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 58 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/B** Collected: **03/17/93 16:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08A** Category: **WATER**

ANALYST: BAR FILE #: 008F0101
INSTRMT: HP_III INJECTED: 03/21/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	123 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

TEST RESULTS BY SAMPLE

Sample Description: **FD-2/B** Collected: **03/17/93 16:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **08B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 004F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	41 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/C** Collected: **03/17/93 16:25** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **09A** Category: **WATER**

ANALYST: BAR FILE #: 009F0101
INSTRMT: HP_III INJECTED: 03/21/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	98	% Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

TEST RESULTS BY SAMPLE

Sample Description: **FD-2/C** Collected: **03/17/93 16:25** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **09B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 013F0101
INSTRMT: HP_II INJECTED: 03/26/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	44 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ANALYST LIST

Ohio Valley Laboratory

03/12/93

BAR - - Beth A. Raper
CAG - - C. Arthur Gray III
CAK - - Cheryl A. Koelsch
CEB - - Chad E. Barnes
DAM - - Dan A. Musgrave
DAR - - Dave A. Reed
DCP - - Daniel C. Peders
DEH - - Doug E. Hesson
DIH - - Deanna I. Hesson
DST - - Dennis S. Tepe
ECL - - Eric C. Lawson
EDG - - Eric D. Gerkin
FEH - - Fay E. Harmon
FRM - - Fred R. Montgomery
GSS - - Greg S. Smith
HV - - Hema Vilasagar
JAS - - Juanna A. Schafer
JBC - - Jim B. Crawford
JEC - - Jesse E. Chapman
JKM - - June K. Morris
JLH - - Janice L. Holland
JOD - - Julia O. Dodd

JWR - - John W. Richards
KHA - - Kim H. Archer
KMM - - Kevin M. McDonald
KPO - - Kevin P. Overstreet
LSB - - Leslie S. Bucina
MAH - - Mary A. Haider
MBJ - - Matthew B. Jarrell
MDC - - Michael D. Cochran
MMB - - Maren M. Burchfield
PDL - - Patricia D. Lane
PNW - - Phillip N. Wright
REB - - Russell E. Burton
RKA - - Robert K. Archer
RWC - - Rodney W. Campbell
SDF - - Scott D. Frum
SLM - - Stephanie L. Mossburg
SMC - - Susan M. Cunningham
SPL - - Steve P. Learn
TAS - - Tamela A. Sams
TLD - - Teresa L. Davis
WCD - - Wade C.Dawson

KEMRON
ENVIRONMENTAL SERVICES

CHAIN-OF-CUSTODY RECORD

No 560

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: 3 weeks

Project No.: 6544

Project Name: Navy-Chicbra Tank Farm

Sampler (print): Cord Lomauro

Signature: Cord Lomauro

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	PAH (8100)	BTEX (8020)	ADDITIONAL REQUIREMENTS
MW-3		✓	3/16/93	1445		✓	4		✓	✓	
MW-11		✓	3/16/93	1515		✓	4		✓	✓	
FD-2/A		✓	3/16/93	1620		✓	4		✓	✓	
FD-2/B		✓	3/17/93	1630		✓	4		✓	✓	
FD-2/C		✓	3/17/93	1625		✓	4		✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Cord Lomauro	3/17/93	1600					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Linda Gregory	3/18/93	9:30	

*Homogenize all co[illegible] samples prior to analysis

White - Lab [illegible] Office Pink - Field

...RVICES

...-CUSTODY RECORD

Page 1 of 1

Pro... ...ntact: Andrew Clark

Turn Around Requirements: 3 weeks

Project No.: 6544 | Project Name: Navy - Chicora Tank Farm

Sampler (print): Cord Lomauro | Signature: Cord Lomauro

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	PAH (8100)	BTEX (8020)	ADDITIONAL REQUIREMENTS
FD-1/A		✓	3/17/93	1540		✓	4		✓	✓	
FD-1/B		✓	3/17/93	1550		✓	4		✓	✓	
FD-1/C		✓	3/17/93	1600		✓	4		✓	✓	
FD-1/D		✓	3/17/93	1610		✓	4		✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Cord Lomauro	3/17/93	1600					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Lesa Gregory	3/18/93	1:30	

*Homogenize all composite samples prior to analysis

White – Lab Yellow – Office Pink – Field

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Andrew Clark
Invoice Number:

Order #: N3-03-260
Date: 04/05/93 14:54
Work ID: 6544/Navy-Chicora Tank Farm
Date Received: 03/17/93
Date Completed: 04/05/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	MW 5	06	MW 1
02	MW 6	07	MW 4
03	MW 7	08	MW 12
04	MW 8	09	MW 10
05	MW 9	10	MW 2

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Leslie Bucina

Certified By
Leslie Bucina

KEMRON ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 5** Collected: **03/16/93 10:40** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **01A** Category: **WATER**

ANALYST: BAR FILE #: 004F0101
INSTRMT: HP_III INJECTED: 03/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	102 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 5** Collected: **03/16/93 10:40** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 005F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 54 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 6** Collected: **03/16/93 09:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02A** Category: **WATER**

ANALYST: BAR FILE #: 005F0101
INSTRMT: HP_III INJECTED: 03/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 98 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW 6** Collected: **03/16/93 09:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 006F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	38 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 7** Collected: **03/16/93 10:05** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03A** Category: **WATER**

ANALYST: BAR FILE #: 006F0101
INSTRMT: HP_III INJECTED: 03/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	95 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW 7** Collected: **03/16/93 10:05** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 007F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 49 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 8** Collected: **03/16/93 09:25** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04A** Category: **WATER**

ANALYST: BAR FILE #: 008F0101
INSTRMT: HP_III INJECTED: 03/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 92 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW 8** Collected: **03/16/93 09:25** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 008F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 71 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTA 3ERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 9**
Test Description: **Volatile Organics (BETX)**

Collected: **03/16/93 09:00** Method: **602/SW8020**
Test Code: **BETX5** Lab No: **05A** Category: **WATER**

ANALYST: BAR
INSTRMT: HP_III INJECTED: 03/17/93

FILE #: 007F0101
FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	92 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW 9** Collected: **03/16/93 09:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 009F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 82 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 1** Collected: **03/16/93 13:25** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06A** Category: **WATER**

ANALYST: BAR FILE #: 009F0101
INSTRMT: HP_III INJECTED: 03/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	94 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW 1** Collected: **03/16/93 13:25** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 010F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	61 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 4** Collected: **03/16/93 11:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07A** Category: **WATER**

ANALYST: BAR FILE #: 010F0101
INSTRMT: HP_III INJECTED: 03/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	7	5.0

SURROGATES
a,a,a-trifluorotoluene 96 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 4** Collected: **03/16/93 11:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 011F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	29 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW 12** Collected: **03/16/93 11:05** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08A** Category: **WATER**

ANALYST: BAR FILE #: 011F0101
INSTRMT: HP_III INJECTED: 03/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	119 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 12** Collected: **03/16/93 11:05** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **08B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 013F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	49 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW 10** Collected: **03/16/93 14:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **09A** Category: **WATER**

ANALYST: BAR FILE #: 005F0101
INSTRMT: HP_III INJECTED: 03/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES

a,a,a-trifluorotoluene	101 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW 10** Collected: **03/16/93 14:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **09B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 014F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 47 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW 2** Collected: **03/16/93 14:20** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **10A** Category: **WATER**

ANALYST: BAR FILE #: 008F0101
INSTRMT: HP_III INJECTED: 03/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**BDL**	5.0
100-41-4	Ethylbenzene	**BDL**	5.0
108-88-3	Toluene	**BDL**	5.0
1330-20-7	Xylenes, Total	**BDL**	5.0

SURROGATES
a,a,a-trifluorotoluene 97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
BDL= BELOW METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW 2** Collected: **03/16/93 14:20** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **10B** Category: **WATER**

ANALYST: HV EXTRACTED: 03/23/93 FILE #: 015F0101
INSTRMT: HP_II INJECTED: 03/25/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 53 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

SW-846 Method 8100 - Polyaromatic Hydrocarbons

EPA Method 602/SW8020 GC/PID Volatile Aromatics

Kemron
ENVIRONMENTAL SERVICES

№ 0[illegible]93

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: Standard (3 weeks)

Project No.: 6544 | Project Name: Navy - Chicora Tank Farm

Sampler (print): Cord Lomauro, Larry Redding | Signature: Cord Lomauro, Larry Redding

Sample I.D. No.	Comp	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	Purgeable Halocarbons 601/8010 (*)	Volatile Aromatics 602/8020	Organochlorine Pesticides & PCBs 608/8080	Polynuclear Aromatics 610/8100	Volatile Organics 624/8240	Semi-Volatile Organics 625/8270	RCRA Metals (Total)	TCLP Metals	TCLP Metals w/MBC	TCLP VOAs, BNAs & Metals	TCLP VOAs, BNAs & Metals w/MBC	BETX 5 ☒ or 1 ☐ 602/8020	TPH 25 ☐ or 10 ☐				ADDITIONAL REQUIREMENTS
MW 5		✓	3/16/93	1040		✓	4		✓											✓					
MW 6		✓		945		✓	4		✓											✓					
MW 7		✓		1005		✓	4		✓											✓					
MW 8		✓		925		✓	4		✓											✓					
MW 9		✓	3/16/93	900		✓	4		✓											✓					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Cord Lomauro	3/16/93	1715			3/17/93	@ 11:45	

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks: (*)
			Belinda Gregory	3/17/93	9:15	Per client cancel 8010 & run 8100. BLG

*Homogenize all comp[illegible]mples prior to analysis

White – Lab Yel[illegible]ffice Pink – Field

kemRon
ENVIRONMENTAL SERVICES

No. [redacted]563

CHAIN-OF-CUSTODY RECORD

Project Contact: Andrew Clark

Turn Around Requirements: Standard (3 weeks)

Project No.: 6544

Project Name: SC- Chicora Tank Farm

Sampler (print): Cord Lomauro, Larry Reading

Signature: [signature]

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	PAH - 8100/610	BTEX - 8020/602	ADDITIONAL REQUIREMENTS
MW 1		✓	3/16/93	1325		✓	4		✓	✓	
MW 4		✓	〃	1100		✓	4		✓	✓	
MW 12		✓	〃	1105		✓	4		✓	✓	
MW 10		✓	〃	1400		✓	4		✓	✓	
MW 2		✓	3/16/93	1420		✓	4		✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	1710	3/16/93					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Brenda Gregory	3/17/93	9:15	

*Homogenize all composite samples prior to analysis

White - Lab Yellow - Office Pink - Field

APPENDIX D
Second Quarter Groundwater Laboratory Results, June 1993

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Cord Lamauro
Invoice Number:

Order #: N3-06-196
Date: 06/17/93 10:54
Work ID: 6544/Navy-Chicora Tank Farm
Date Received: 06/10/93
Date Completed: 06/17/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	FD-2/A
02	FD-2/B
03	FD-2/C
04	FD-3
05	MW-1
06	MW-4
07	MW-5
08	MW-8
09	MW-9
10	MW-12

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/A** Collected: **06/08/93 17:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **01A** Category: **WATER**

ANALYST: BAR FILE #: 003R0202
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 113 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-2/A** Collected: **06/08/93 17:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 009F0101
INSTRMT: HP_II INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	**ND**	1
208-96-8	Acenaphthylene	**ND**	1
83-32-9	Acenaphthene	**ND**	1
86-73-7	Fluorene	**ND**	1
85-01-8	Phenanthrene	**ND**	1
120-12-7	Anthracene	**ND**	1
206-44-0	Fluoranthene	**ND**	1
129-00-0	Pyrene	**ND**	1
56-55-3	Benzo(a)anthracene	**ND**	5
218-01-9	Chrysene	**ND**	5
205-99-2	Benzo(b)fluoranthene	**ND**	5
207-08-9	Benzo(k)fluoranthene	**ND**	5
50-32-8	Benzo(a)pyrene	**ND**	5
193-39-5	Indeno(1,2,3-cd)pyrene	**ND**	5
53-70-3	Dibenzo(a,h)anthracene	**ND**	5
191-24-2	Benzo(g,h,i)perylene	**ND**	5

SURROGATES
2-methyl-naphthalene 72 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **FD-2/B** Collected: **06/08/93 17:50** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02A** Category: **WATER**

ANALYST: BAR FILE #: 006R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 113 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-2/B** Collected: **06/08/93 17:50** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 010F0101
INSTRMT: HP_II INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	59 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/C** Collected: **06/08/93 17:55** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03A** Category: **WATER**

ANALYST: BAR FILE #: 007R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 113 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-2/C** Collected: **06/08/93 17:55** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 011F0101
INSTRMT: HP_II INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	**ND**	1
208-96-8	Acenaphthylene	**ND**	1
83-32-9	Acenaphthene	**ND**	1
86-73-7	Fluorene	**ND**	1
85-01-8	Phenanthrene	**ND**	1
120-12-7	Anthracene	**ND**	1
206-44-0	Fluoranthene	**ND**	1
129-00-0	Pyrene	**ND**	1
56-55-3	Benzo(a)anthracene	**ND**	5
218-01-9	Chrysene	**ND**	5
205-99-2	Benzo(b)fluoranthene	**ND**	5
207-08-9	Benzo(k)fluoranthene	**ND**	5
50-32-8	Benzo(a)pyrene	**ND**	5
193-39-5	Indeno(1,2,3-cd)pyrene	**ND**	5
53-70-3	Dibenzo(a,h)anthracene	**ND**	5
191-24-2	Benzo(g,h,i)perylene	**ND**	5

SURROGATES
2-methyl-naphthalene 76 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-3** Collected: **06/08/93 18:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04A** Category: **WATER**

ANALYST: BAR FILE #: 021R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 108 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-3** Collected: **06/08/93 18:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 011F0101
INSTRMT: HP_II INJECTED: 06/14/93 FACTOR: 500 * UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	500
208-96-8	Acenaphthylene	ND	500
83-32-9	Acenaphthene	ND	500
86-73-7	Fluorene	ND	500
85-01-8	Phenanthrene	ND	500
120-12-7	Anthracene	ND	500
206-44-0	Fluoranthene	ND	500
129-00-0	Pyrene	ND	500
56-55-3	Benzo(a)anthracene	ND	2500
218-01-9	Chrysene	ND	2500
205-99-2	Benzo(b)fluoranthene	ND	2500
207-08-9	Benzo(k)fluoranthene	ND	2500
50-32-8	Benzo(a)pyrene	ND	2500
193-39-5	Indeno(1,2,3-cd)pyrene	ND	2500
53-70-3	Dibenzo(a,h)anthracene	ND	2500
191-24-2	Benzo(g,h,i)perylene	ND	2500

SURROGATES

	DL	% Recovery
2-methyl-naphthalene		

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
DL = DILUTED OUT
* = ELEVATED DETECTION LIMIT DUE TO SAMPLE MATRIX

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-1** Collected: **06/09/93 09:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05A** Category: **WATER**

ANALYST: BAR FILE #: 009R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 113 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-1** Collected: **06/09/93 09:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 013F0101
INSTRMT: HP_II INJECTED: 06/12/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 73 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-4** Collected: **06/08/93 12:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06A** Category: **WATER**

ANALYST: BAR FILE #: 010R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 112 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-4** Collected: **06/08/93 12:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 005F0101
INSTRMT: HP_II INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 48 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-5** Collected: **06/08/93 12:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07A** Category: **WATER**

ANALYST: BAR FILE #: 012R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 114 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-5** Collected: **06/08/93 12:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 006F0101
INSTRMT: HP_II INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 88 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-8** Collected: **06/08/93 14:40** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08A** Category: **WATER**

ANALYST: BAR FILE #: 013R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 112 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW-8** Collected: **06/08/93 14:40** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **08B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 007F0101
INSTRMT: HP_II INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 87 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-9** Collected: **06/08/93 15:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **09A** Category: **WATER**

ANALYST: BAR FILE #: 014R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 106 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-9** Collected: **06/08/93 15:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **09B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 008F0101
INSTRMT: HP_II INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 84 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-12** Collected: **06/08/93 14:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **10A** Category: **WATER**

ANALYST: BAR FILE #: 015R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 111 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTA SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-12** Collected: **06/08/93 14:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **10B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/11/93 FILE #: 006F0101
INSTRMT: HP_II INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	81 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Kemron
ENVIRONMENTAL SERVICES

CHAIN-OF-CUSTODY RECORD

№ 09845

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: 2 weeks

Project No.: 6544

Project Name: Navy - Chicora Tank Farm

Sampler (print): Carl Lomauro

Signature: Carl Lomauro

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	BTEX 8020	PAH 8100	ADDITIONAL REQUIREMENTS
FD-2/A		✓	6/8/93	1745			4		✓	✓	
FD-2/B		✓	6/8/93	1750			4		✓	✓	*1 VOA Rec'd Broken
FD-2/C		✓	6/8/93	1755			4		✓	✓	
FD-3		✓	6/8/93	1800			4		✓	✓	*1 VOA Rec'd Broken
MW-1		✓	6/9/93	900			4		✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Carl Lomauro	6/9/93	1030					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Jodi Stauver	6/9/93	1800	

*Homogenize all composite samples prior to analysis

White Lab Yellow Office Pink Field

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Cord Lomauro
Invoice Number:

Order #: N3-06-201
Date: 06/24/93 13:20
Work ID: 6544/Navy-Chicora
Date Received: 06/10/93
Date Completed: 06/24/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	MW-5
02	Equip. Blank
03	MW-2
04	MW-3
05	MW-6
06	MW-7
07	MW-11
08	Trip Blank

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample: 01A MW-5 **Collected: 06/08/93 Category: WATER**
Job: MET8 RCRA Metals - Water

Test Description	Result	Det Limit	Units	Analyzed	By
Arsenic, Total	0.01	0.004	mg/L As	06/15/93	TAS
Barium, Total	0.31	0.01	mg/L Ba	06/16/93	JBC
Cadmium, Total	<0.01	0.01	mg/L Cd	06/16/93	JBC
Chromium, Total	0.08	0.02	mg/L Cr	06/16/93	JBC
Lead, Total	0.02	0.005	mg/L Pb	06/23/93	TAS
Mercury, Total	<0.0002	0.0002	mg/L Hg	06/16/93	TAS
Selenium, Total	<0.004	0.004	mg/L Se	06/15/93	TAS
Silver, Total	<0.01	0.01	mg/L Ag	06/16/93	JBC

Sample Description: **Equip. Blank** Collected: **06/08/93 11:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02A** Category: **WATER**

ANALYST: MBJ FILE #: 011R0101
INSTRMT: HP_V INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	102 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Equip. Blank** Collected: **06/08/93 11:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 006F0201
INSTRMT: HP_II INJECTED: 06/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	52 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-2** Collected: **06/08/93 11:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03A** Category: **WATER**

ANALYST: MBJ
INSTRMT: HP_V INJECTED: 06/14/93 FILE #: 012R0101
FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	99 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-2** Collected: **06/08/93 11:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 009F0201
INSTRMT: HP_II INJECTED: 06/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 49 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-3** Collected: **06/08/93 11:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04A** Category: **WATER**

ANALYST: MBJ FILE #: 013R0101
INSTRMT: HP_V INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 99 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

TEST RESULTS BY SAMPLE

Sample Description: **MW-3** Collected: **06/08/93 11:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 010F0201
INSTRMT: HP_II INJECTED: 06/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	**ND**	1
208-96-8	Acenaphthylene	**ND**	1
83-32-9	Acenaphthene	**ND**	1
86-73-7	Fluorene	**ND**	1
85-01-8	Phenanthrene	**ND**	1
120-12-7	Anthracene	**ND**	1
206-44-0	Fluoranthene	**ND**	1
129-00-0	Pyrene	**ND**	1
56-55-3	Benzo(a)anthracene	**ND**	5
218-01-9	Chrysene	**ND**	5
205-99-2	Benzo(b)fluoranthene	**ND**	5
207-08-9	Benzo(k)fluoranthene	**ND**	5
50-32-8	Benzo(a)pyrene	**ND**	5
193-39-5	Indeno(1,2,3-cd)pyrene	**ND**	5
53-70-3	Dibenzo(a,h)anthracene	**ND**	5
191-24-2	Benzo(g,h,i)perylene	**ND**	5

SURROGATES

2-methyl-naphthalene	58 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-6** Collected: **06/08/93 10:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05A** Category: **WATER**

ANALYST: MBJ FILE #: 014R0101
INSTRMT: HP_V INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	102 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

TEST RESULTS BY SAMPLE

Sample Description: **MW-6** Collected: **06/08/93 10:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 011F0201
INSTRMT: HP_II INJECTED: 06/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	49 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-7** Collected: **06/08/93 15:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06A** Category: **WATER**

ANALYST: MBJ FILE #: 015R0101
INSTRMT: HP_V INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	100 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-7** Collected: **06/08/93 15:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 012F0201
INSTRMT: HP_II INJECTED: 06/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 61 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-11** Collected: **06/08/93 10:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07A** Category: **WATER**

ANALYST: MBJ
INSTRMT: HP_V INJECTED: 06/14/93 FILE #: 016R0101
FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 98 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-11** Collected: **06/08/93 10:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 013F0201
INSTRMT: HP_II INJECTED: 06/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	63 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Trip Blank** Collected: **06/08/93** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08A** Category: **WATER**

ANALYST: MBJ FILE #: 020R0101
INSTRMT: HP_V INJECTED: 06/14/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

SW-846 Method 8100 - Polyaromatic Hydrocarbons

EPA Method 602/SW8020 GC/PID Volatile Aromatics

EPA Method 200.7 (ICP) - Silver

EPA Method 206.3/SW7061 (AA Vapor Hydride) - Arsenic

EPA Method 200.7/SW6010 (ICP) - Barium

EPA Method 200.7/SW6010 (ICP) - Cadmium

EPA Method 200.7/SW6010 (ICP) - Chromium, Total

EPA Method 245.1/SW7470 (Cold Vapor) - Mercury

EPA Method 239.2/SW7421 (GFAA) - Lead

EPA Method 270.3/SW7741 (Vapor Hydride) - Selenium

EPA Method SW3005 and/or SW3020 - Metals Digestion

Kemron
ENVIRONMENTAL SERVICES

№ 59844

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: ANDREW CLARK

Turn Around Requirements: 2 weeks

Project No.: 6544 | Project Name: NAVY - CHICORA DANK FARM - Charleston SC

Sampler (print): CORD LOMARO | Signature:

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	PAH M8100	BTEX M8020	ADDITIONAL REQUIREMENTS
MW-2		X	6-8-93	1145		X	4		X	X	
MW-3		X	6-8-93	1100		X	4		X	X	
MW-6		X	6-8-93	1000		X	4		X	X	
MW-7		X	6-8-93	1545		X	4		X	X	
MW-11		X	6-8-93	1030		X	4		X	X	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	6/8/93	1030					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
				6/10	1500	

*Homogenize all composite samples prior to analysis

White – Lab Yellow – Office Pink – Field

Kemron
ENVIRONMENTAL SERVICES

CHAIN-OF-CUSTODY RECORD

№ 59846

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: 2 weeks

Project No.: 6544

Project Name: Navy - Chicora

Sampler (print): Cord Lomauro

Signature: Cord Lomauro

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	BTEX 8020	PAH 8100	Metals 8	ADDITIONAL REQUIREMENTS
MW-5		✓	6/8/93	1245			1				✓	
Trip Blank		✓	~~6/8/93~~ 6/9/93	1500			1		✓			
Equip. Blank		✓	6/8/93	1130			4		✓	✓		
Field Blank		✓	6/9/93	915			3	✓				1+0 MS(✱)

(✱) 6/10/93 @ 16:00 Cancel FB per Client's request BIG

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Cord Lomauro	6/9/93	1030					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks
			Beverly Gregory	6/10/93	1500	Contact Cord L. about Field blank w/on receipt.

*Homogenize all co[illegible] samples prior to analysis

White - Lab / Office Pink - Field

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Cord Lomauro
Invoice Number:

Order #: N3-06-202
Date: 06/24/93 13:36
Work ID: 6544/Navy-Chicora Tank
Date Received: 06/10/93
Date Completed: 06/24/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	MW-10
02	FD-1/A
03	FD-1/B
04	FD-1/C
05	FD-1/D

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

Kemron
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-10** Collected: **06/08/93 16:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **01A** Category: **WATER**

ANALYST: MBJ FILE #: 016R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	110 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-10** Collected: **06/08/93 16:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 016F0201
INSTRMT: HP_II INJECTED: 06/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 68 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/A** Collected: **06/08/93 16:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02A** Category: **WATER**

ANALYST: MBJ FILE #: 017R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 109 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1/A** Collected: **06/08/93 16:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 017F0201
INSTRMT: HP_II INJECTED: 06/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 74 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **FD-1/B** Collected: **06/08/93 16:50** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03A** Category: **WATER**

ANALYST: MBJ FILE #: 018R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 110 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1/B** Collected: **06/08/93 16:50** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 018F0201
INSTRMT: HP_II INJECTED: 06/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 62 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/C** Collected: **06/08/93 16:55** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04A** Category: **WATER**

ANALYST: MBJ FILE #: 019R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	112 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1/C** Collected: **06/08/93 16:55** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 019F0201
INSTRMT: HP_II INJECTED: 06/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	75 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **FD-1/D** Collected: **06/08/93 17:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05A** Category: **WATER**

ANALYST: MBJ FILE #: 020R0101
INSTRMT: HP_V INJECTED: 06/11/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 113 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1/D** Collected: **06/08/93 17:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05B** Category: **WATER**

ANALYST: HV EXTRACTED: 06/14/93 FILE #: 020F0201
INSTRMT: HP_II INJECTED: 06/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	75 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

SW-846 Method 8100 - Polyaromatic Hydrocarbons

EPA Method 602/SW8020 GC/PID Volatile Aromatics

KEMRON ANALYST LIST

Ohio Valley Laboratory

05/26/93

BAR - - Beth A. Raper
CAG - - C. Arthur Gray III
CAK - - Cheryl A. Koelsch
CEB - - Chad E. Barnes
DAM - - Dan A. Musgrave
DAR - - Dave A. Reed
DCP - - Daniel C. Peders
DIH - - Deanna I. Hesson
DJP - - Douglas J. Pohling
DST - - Dennis S. Tepe
ECL - - Eric C. Lawson
EDG - - Eric D. Gerkin
FEH - - Fay E. Harmon
FRM - - Fred R. Montgomery
GSS - - Greg S. Smith
HV - - Hema Vilasagar
JAS - - Juanna A. Schafer
JBC - - Jim B. Crawford
JEC - - Jesse E. Chapman
JKM - - June K. Morris
JLH - - Janice L. Holland
JOD - - Julia O. Dodd

JWR - - John W. Richards
KHA - - Kim H. Archer
KMM - - Kevin M. McDonald
KPO - - Kevin P. Overstreet
LSB - - Leslie S. Bucina
MAH - - Mary A. Haider
MBJ - - Matthew B. Jarrell
MDC - - Michael D. Cochran
MMB - - Maren M. Burchfield
PDL - - Patricia D. Lane
PNW - - Phillip N. Wright
REB - - Russell E. Burton
RKA - - Robert K. Archer
RWC - - Rodney W. Campbell
SDF - - Scott D. Frum
SLM - - Stephanie L. Mossburg
SMC - - Susan M. Cunningham
SPL - - Steve P. Learn
TAS - - Tamela A. Sams
TKT - - Tonya K. Troutner
TLD - - Teresa L. Davis
WCD - - Wade C.Dawson

ENVIRONMENTAL SERVICES

N 59843

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: ANDREW CLARK

Turn Around Requirements: 2 WEEKS

Project No.: 6544

Project Name: NAVY - Chicora Tank Farm - Charleston, SC

Sampler (print): Carl Lomanno

Signature: Carl Lomanno

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	PAH 8100	BTEX 8020	ADDITIONAL REQUIREMENTS
MW-1D		X	6-8-93	1615		X	4		✓	✓	
FD-1/A		X	6-8-93	1645		X	4		✓	✓	
FD-1/B		X	6-8-93	1650		X	4		✓	✓	
FD-1/C		X	6-8-93	1655		X	4		✓	✓	
FD-1/D		X	6-8-93	1700		X	4		✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Carl Lomanno	6/9/93	1430					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Jodi Stiles	6/10/93	1530	

*Homogenize all composite samples prior to analysis

White – Lab Yellow – Office Pink – Field

APPENDIX E
Third Quarter Groundwater Laboratory Results, September 1993

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

OCT

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Cord Lomauro
Invoice Number:

Order #: N3-09-148
Date: 09/30/93 09:29
Work ID: 6544/Navy-Chicora T.F.
Date Received: 09/09/93
Date Completed: 09/30/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	MW-6	06	MW-2
02	MW-7	07	MW-3
03	MW-8	08	MW-4
04	MW-9	09	MW-5
05	MW-10	10	MW-11

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON
ENVIRONMENTAL SERVICES

Sample Description: **MW-6** Collected: **09/08/93 16:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 005F0101
INSTRMT: HP_II INJECTED: 09/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	54 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-6** Collected: **09/08/93 16:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **01B** Category: **WATER**

ANALYST: BAR FILE #: 004F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 109 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-7** Collected: **09/08/93 13:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 008F0101
INSTRMT: HP_II INJECTED: 09/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 59 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-7** Collected: **09/08/93 13:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02B** Category: **WATER**

ANALYST: BAR FILE #: 005F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES
a,a,a-trifluorotoluene 106 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-8** Collected: **09/08/93 11:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 009F0101
INSTRMT: HP_II INJECTED: 09/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	64 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-8** Collected: **09/08/93 11:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03B** Category: **WATER**

ANALYST: BAR FILE #: 006F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES
a,a,a-trifluorotoluene 108 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-9** Collected: **09/08/93 11:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 010F0101
INSTRMT: HP_II INJECTED: 09/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	75 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-9** Collected: **09/08/93 11:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04B** Category: **WATER**

ANALYST: BAR FILE #: 007F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES
a,a,a-trifluorotoluene 100 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-10** Collected: **09/08/93 10:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 011F0101
INSTRMT: HP_II INJECTED: 09/15/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 68 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-10** Collected: **09/08/93 10:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05B** Category: **WATER**

ANALYST: BAR FILE #: 008F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES

a,a,a-trifluorotoluene	87 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW-2** Collected: **09/08/93 14:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 002F0101
INSTRMT: HP_II INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	47 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-2** Collected: **09/08/93 14:45** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06B** Category: **WATER**

ANALYST: BAR FILE #: 009F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES

a,a,a-trifluorotoluene	123 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-3** Collected: **09/08/93 15:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 003F0101
INSTRMT: HP_II INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	63 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-3** Collected: **09/08/93 15:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07B** Category: **WATER**

ANALYST: BAR FILE #: 010F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES
a,a,a-trifluorotoluene 106 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-4** Collected: **09/08/93 14:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **08A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 004F0101
INSTRMT: HP_II INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 14 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-4** Collected: **09/08/93 14:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08B** Category: **WATER**

ANALYST: BAR FILE #: 011F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES

a,a,a-trifluorotoluene	110 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-5** Collected: **09/08/93 13:40** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **09A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 005F0101
INSTRMT: HP_II INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	52 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-5** Collected: **09/08/93 13:40** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **09B** Category: **WATER**

ANALYST: BAR FILE #: 014F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES

a,a,a-trifluorotoluene	109	% Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-11** Collected: **09/08/93 16:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **10A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/14/93 FILE #: 006F0101
INSTRMT: HP_II INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	71 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-11** Collected: **09/08/93 16:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **10B** Category: **WATER**

ANALYST: BAR FILE #: 015F0101
INSTRMT: HP_III INJECTED: 09/10/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES
a,a,a-trifluorotoluene 91 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

SW-846 Method 8100 - Polyaromatic Hydrocarbons

EPA Method 602/SW8020 GC/PID Volatile Aromatics

KEMRON ANALYST LIST

Ohio Valley Laboratory

07/12/93

BAR - - Beth A. Raper
CAG - - C. Arthur Gray III
CAK - - Cheryl A. Koelsch
CEB - - Chad E. Barnes
DAM - - Dan A. Musgrave
DAR - - Dave A. Reed
DCP - - Daniel C. Peders
DDT - - Darrin D. Treadway
DIH - - Deanna I. Hesson
DJP - - Douglas J. Pohling
DST - - Dennis S. Tepe
ECL - - Eric C. Lawson
EDG - - Eric D. Gerkin
EMG - - Eric M. Graban
FEH - - Fay E. Harmon
FRM - - Fred R. Montgomery
GWH - - George W. Hutchison
GSS - - Greg S. Smith
HV - - Hema Vilasagar
JAS - - Juanna A. Schafer
JBC - - Jim B. Crawford
JEC - - Jesse E. Chapman
JKM - - June K. Morris
JLH - - Janice L. Holland
JWR - - John W. Richards
KHA - - Kim H. Archer
KMM - - Kevin M. McDonald
KPO - - Kevin P. Overstreet
LSB - - Leslie S. Bucina
MAH - - Mary A. Haider
MBJ - - Matthew B. Jarrell
MDC - - Michael D. Cochran
MMB - - Maren M. Burchfield
PDL - - Patricia D. Lane
PNW - - Phillip N. Wright
REB - - Russell E. Burton
RKA - - Robert K. Archer
RWC - - Rodney W. Campbell
SCW - - Stephen C. West
SDF - - Scott D. Frum
SLM - - Stephanie L. Mossburg
SMC - - Susan M. Cunningham
SPL - - Steve P. Learn
TAS - - Tamela A. Sams
TKT - - Tonya K. Troutner
TLD - - Teresa L. Davis
WCD - - Wade C.Dawson

CASE NARRATIVE
KEMRON WORK ORDER #: N3-09-187
PROJECT #: 6544

CLIENT ID	KEMRON ID	DATE RECEIVED
FD-2/A	N3-09-187-01	09/10/93
FD-2/B	N3-09-187-02	09/10/93
FD-2/C	N3-09-187-03	09/10/93
FD-3	N3-09-187-04	09/10/93
MW-12	N3-09-187-05	09/10/93
FD-1/A	N3-09-187-06	09/10/93
FD-1/B	N3-09-187-07	09/10/93
FD-1/C	N3-09-187-08	09/10/93
FD-1/D	N3-09-187-09	09/10/93
MW-1	N3-09-187-10	09/10/93
EQUIP. RINSE	N3-09-187-11	09/10/93
TRIP BLANK	N3-09-187-12	09/10/93
MW-5	N3-09-187-13	09/10/93
SED 2	N3-09-187-14	09/10/93

Two samples (client ID MW-1 and Equip. Rinse) which required SW-846 Method 8100 analyses were extracted eight days from date of collection. All other samples were extracted and analyzed within the required holding times. Resampling and reanalyses of samples MW-1 and Equip. Rinse were performed in compliance. Results for the reanalysis data are traceable to work order # N3-10-008.

At your request the sample chromatograms were reviewed for a qualitatitive identification. It was observed that samples N3-09-187-1 through 5 contained hydrocarbon spectra resembling lube oil. Samples N3-09-187-6 through 11 contained amounts at or below the level of detection therefore no conclusion can be made for the identification. In addition, sample N3-09-187-04 was reported with a dilution factor 1. This was achieved only because the analytes detected by the first column analysis were not confirmed by the second column analysis as per SW-846 methodology. The interference produced by the lube oil carbon range typically requires a dilution; however in this case no. dilution was necessary.

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Andrew Clark
Invoice Number:

Order #: N3-10-008
Date: 10/05/93 16:23
Work ID: 6544/Navy-Chicora T.F.
Date Received: 10/01/93
Date Completed: 10/05/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	MW-1	02	Equip. Rinse

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-1** Collected: **09/30/93 13:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01A** Category: **WATER**

ANALYST: HV EXTRACTED: 10/03/93 FILE #: 011F0101
INSTRMT: HP_II INJECTED: 10/05/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	74 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Equip. Rinse** Collected: **09/30/93 12:50** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02A** Category: **WATER**

ANALYST: HV EXTRACTED: 10/03/93 FILE #: 012F0101
INSTRMT: HP_II INJECTED: 10/05/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 96 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

SW-846 Method 8100 - Polyaromatic Hydrocarbons

KEMRON ANALYST LIST

Ohio Valley Laboratory

07/12/93

BAR - - Beth A. Raper
CAG - - C. Arthur Gray III
CAK - - Cheryl A. Koelsch
CEB - - Chad E. Barnes
DAM - - Dan A. Musgrave
DAR - - Dave A. Reed
DCP - - Daniel C. Peders
DDT - - Darrin D. Treadway
DIH - - Deanna I. Hesson
DJP - - Douglas J. Pohling
DST - - Dennis S. Tepe
ECL - - Eric C. Lawson
EDG - - Eric D. Gerkin
EMG - - Eric M. Graban
FEH - - Fay E. Harmon
FRM - - Fred R. Montgomery
GWH - - George W. Hutchison
GSS - - Greg S. Smith
HV - - Hema Vilasagar
JAS - - Juanna A. Schafer
JBC - - Jim B. Crawford
JEC - - Jesse E. Chapman
JKM - - June K. Morris
JLH - - Janice L. Holland
JWR - - John W. Richards
KHA - - Kim H. Archer
KMM - - Kevin M. McDonald
KPO - - Kevin P. Overstreet
LSB - - Leslie S. Bucina
MAH - - Mary A. Haider
MBJ - - Matthew B. Jarrell
MDC - - Michael D. Cochran
MMB - - Maren M. Burchfield
PDL - - Patricia D. Lane
PNW - - Phillip N. Wright
REB - - Russell E. Burton
RKA - - Robert K. Archer
RWC - - Rodney W. Campbell
SCW - - Stephen C. West
SDF - - Scott D. Frum
SLM - - Stephanie L. Mossburg
SMC - - Susan M. Cunningham
SPL - - Steve P. Learn
TAS - - Tamela A. Sams
TKT - - Tonya K. Troutner
TLD - - Teresa L. Davis
WCD - - Wade C.Dawson

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Cord Lomauro
Invoice Number:

Order #: N3-09-187
Date: 10/01/93 13:07
Work ID: 6544/Navy-Chicora
Date Received: 09/10/93
Date Completed: 10/01/93
Client Code: WAPATL_59227

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	FD-2/A
02	FD-2/B
03	FD-2/C
04	FD-3
05	MW-12
06	FD-1/A
07	FD-1/B
08	FD-1/C
09	FD-1/D
10	MW-1
11	Equip. Rinse
12	Trip Blank
13	MW-5
14	Sed 2

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON ENVIRONMENTAL SERVICES

Sample: 13A MW-5 **Collected: 09/08/93** **Category: WATER**
Job: MET8 RCRA Metals - Water

Test Description	Result	Det Limit	Units	Analyzed	By
Arsenic, Total	0.041	0.004	mg/L As	09/21/93	JEC
Barium, Total	0.44	0.01	mg/L Ba	09/17/93	JBC
Cadmium, Total	<0.01	0.01	mg/L Cd	09/17/93	JBC
Chromium, Total	0.09	0.02	mg/L Cr	09/17/93	JBC
Lead, Total	0.03	0.005	mg/L Pb	09/21/93	JKM
Mercury, Total	0.0003	0.0002	mg/L Hg	09/20/93	TAS
Selenium, Total	<0.004	0.004	mg/L Se	09/22/93	TAS
Silver, Total	<0.01	0.01	mg/L Ag	09/17/93	JBC

Sample: 14A Sed 2 **Collected: 09/09/93** **Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Gasoline Range Organics	180	100	ug/kg	09/13/93	MBJ

Sample: 14B Sed 2 **Collected: 09/09/93** **Category: SOIL**

Test Description	Result	Det Limit	Units	Analyzed	By
Diesel Range Organics	22,000	4000	ug/kg	09/23/93	HV
Percent Solids	76	1	% wt.	09/22/93	DJP

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/A** Collected: **09/09/93 11:20** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 018F0101
INSTRMT: HP_II INJECTED: 09/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	47 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/A** Collected: **09/09/93 11:20** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **01B** Category: **WATER**

ANALYST: BAR FILE #: 014F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	104 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/B** Collected: **09/09/93 11:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 019F0101
INSTRMT: HP_II INJECTED: 09/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	54 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/B** Collected: **09/09/93 11:30** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02B** Category: **WATER**

ANALYST: BAR FILE #: 015F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 102 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-2/C** Collected: **09/09/93 11:40** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 020F0101
INSTRMT: HP_II INJECTED: 09/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	49 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2/C** Collected: **09/09/93 11:40** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03B** Category: **WATER**

ANALYST: BAR FILE #: 016F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	98 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-3** Collected: **09/09/93 12:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 021F0101
INSTRMT: HP_II INJECTED: 09/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 63 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-3** Collected: **09/09/93 12:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04B** Category: **WATER**

ANALYST: BAR FILE #: 017F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	102 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-12** Collected: **09/09/93 12:10** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 022F0101
INSTRMT: HP_II INJECTED: 09/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	85 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-12** Collected: **09/09/93 12:10** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05B** Category: **WATER**

ANALYST: BAR FILE #: 018F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/A** Collected: **09/09/93 09:40** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 025F0101
INSTRMT: HP_II INJECTED: 09/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	60 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/A** Collected: **09/09/93 09:40** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06B** Category: **WATER**

ANALYST: BAR FILE #: 019F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	91 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1/B** Collected: **09/09/93 09:50** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 027F0101
INSTRMT: HP_II INJECTED: 09/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	75 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/B** Collected: **09/09/93 09:50** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07B** Category: **WATER**

ANALYST: BAR FILE #: 020F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	94 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/C** Collected: **09/09/93 10:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **08A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 028F0101
INSTRMT: HP_II INJECTED: 09/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	73 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/C** Collected: **09/09/93 10:00** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08B** Category: **WATER**

ANALYST: BAR FILE #: 021F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	91 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1/D** Collected: **09/09/93 10:10** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **09A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 029F0101
INSTRMT: HP_II INJECTED: 09/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	82 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **FD-1/D** Collected: **09/09/93 10:10** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **09B** Category: **WATER**

ANALYST: BAR FILE #: 024F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-1** Collected: **09/08/93 17:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **10A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 030F0101
INSTRMT: HP_II INJECTED: 09/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	78 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-1** Collected: **09/08/93 17:15** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **10B** Category: **WATER**

ANALYST: BAR FILE #: 022F0101
INSTRMT: HP_III INJECTED: 09/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	95 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Equip. Rinse** Collected: **09/08/93 13:40** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **11A** Category: **WATER**

ANALYST: HV EXTRACTED: 09/16/93 FILE #: 031F0101
INSTRMT: HP_II INJECTED: 09/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	78 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Equip. Rinse** Collected: **09/08/93 13:40** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **11B** Category: **WATER**

ANALYST: BAR FILE #: 025F0101
INSTRMT: HP_III INJECTED: 09/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	91 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **Trip Blank** Collected: **09/09/93** Method: **602/SW8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **12A** Category: **WATER**

ANALYST: BAR FILE #: 026F0101
INSTRMT: HP_III INJECTED: 09/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	95 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Percent Solids
EPA Method 160.3 - Gravimetric, Dried at 103-105 Degrees C
To convert test results to "Dry Weight Basis" use this formula:

$$\text{RESULT (DRY WT.)} = \frac{\text{RESULT (REPORTED) X 100}}{\text{PERCENT SOLIDS}}$$

EPA Method 200.7 (ICP) - Silver

SW7060 - Arsenic (GFAA)

EPA Method 200.7/SW6010 (ICP) - Barium

EPA Method 200.7/SW6010 (ICP) - Cadmium

EPA Method 200.7/SW6010 (ICP) - Chromium

EPA Method 245.1/SW7470 (Cold Vapor) - Mercury

EPA Method 239.2/SW7421 (GFAA) - Lead

SW7740 - Selenium (GFAA)

EPA Method SW3005 and/or SW3020 - Metals Digestion

SW-846 3550/8015 - Diesel Range Organics

SW-846 Method 8100 - Polyaromatic Hydrocarbons

EPA Method 602/SW8020 GC/PID Volatile Aromatics

SW-846 5030/8015 - Gasoline Range Organics

KEMRON ANALYST LIST

Ohio Valley Laboratory

07/12/93

BAR - - Beth A. Raper
CAG - - C. Arthur Gray III
CAK - - Cheryl A. Koelsch
CEB - - Chad E. Barnes
DAM - - Dan A. Musgrave
DAR - - Dave A. Reed
DCP - - Daniel C. Peders
DDT - - Darrin D. Treadway
DIH - - Deanna I. Hesson
DJP - - Douglas J. Pohling
DST - - Dennis S. Tepe
ECL - - Eric C. Lawson
EDG - - Eric D. Gerkin
EMG - - Eric M. Graban
FEH - - Fay E. Harmon
FRM - - Fred R. Montgomery
GWH - - George W. Hutchison
GSS - - Greg S. Smith
HV - - Hema Vilasagar
JAS - - Juanna A. Schafer
JBC - - Jim B. Crawford
JEC - - Jesse E. Chapman
JKM - - June K. Morris
JLH - - Janice L. Holland
JWR - - John W. Richards
KHA - - Kim H. Archer
KMM - - Kevin M. McDonald
KPO - - Kevin P. Overstreet
LSB - - Leslie S. Bucina
MAH - - Mary A. Haider
MBJ - - Matthew B. Jarrell
MDC - - Michael D. Cochran
MMB - - Maren M. Burchfield
PDL - - Patricia D. Lane
PNW - - Phillip N. Wright
REB - - Russell E. Burton
RKA - - Robert K. Archer
RWC - - Rodney W. Campbell
SCW - - Stephen C. West
SDF - - Scott D. Frum
SLM - - Stephanie L. Mossburg
SMC - - Susan M. Cunningham
SPL - - Steve P. Learn
TAS - - Tamela A. Sams
TKT - - Tonya K. Troutner
TLD - - Teresa L. Davis
WCD - - Wade C.Dawson

Kemron
ENVIRONMENTAL SERVICES

№ 00165

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: Standard

Project No.: 6544 | Project Name: Navy - Chicora

Sampler (print): Cord Lomauro | Signature: Cord Lomauro

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	Purgeable Halocarbons 601/8010	Volatile Aromatics 602/8020	Organochlorine Pesticides & PCBs 608/8080	Polynuclear Aromatics 610/8100	Volatile Organics 624/8240	Semi-Volatile Organics 625/8270	RCRA Metals (Total)	TCLP Metals	TCLP Metals w/MBC	TCLP VOAs, BNAs & Metals	TCLP VOAs, BNAs & Metals w/MBC	BETX 5☐ or 1☐	TPH 25☐ or 10☐				ADDITIONAL REQUIREMENTS
FD-2/A			9/9/93	1120			4					✓								✓					
FD-2/B				1130			4					✓								✓					
FD-2/C				1140			4					✓								✓					
FD-3				1200			4					✓								✓					
MW-12				1210			4					✓								✓					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Cord Lomauro	9/9/93	1400					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Jodi Stowell	9/10/93	1000	

*Homogenize all composite samples prior to analysis

White – Lab Yellow – Office Pink – Field

KEMRON
ENVIRONMENTAL SERVICES

№ 9004

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: Standard

Project No.: 6544 | Project Name: Navy - Chicora

Sampler (print): Cord Lonauro | Signature: Cord Lonauro

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	PAH-8100	BTEX	METALS 8	DRO	GRO	ADDITIONAL REQUIREMENTS
MW-1			9/8/93	1715			4		✓	✓				
*Equip Rinse			9/8/93	1340			4		✓	✓				* Rock / Lites broken
MW-5			9/8/93	1340			1				✓			
Sed 2			9/9/93	1215			2					✓	✓	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Cord Lonauro	9/9/93	1400					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Joni Stowell	9/10/93	1000	

*Homogenize all comp[illegible]mples prior to analysis

White – Lab Yel[illegible]ffice Pink – Field

KEMRON
ENVIRONMENTAL SERVICES

№ C-162

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: Andrea Clark

Turn Around Requirements: Standard

Project No.: 6544 Project Name: Navy-Chicora

Sampler (print): Carl Lomauro Signature: Carl Lomauro

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	Purgeable Halocarbons 601/8010	Volatile Aromatics 602/8020	Organochlorine Pesticides & PCBs 608/8080	Polynuclear Aromatics 610/8100*	Volatile Organics 624/8240	Semi-Volatile Organics 625/8270	RCRA Metals (Total)	TCLP Metals	TCLP Metals w/MBC	TCLP VOAs, BNAs & Metals	TCLP VOAs, BNAs & Metals w/MBC	BETX 5☐ or 1☐	TPH 25☐ or 10☐				ADDITIONAL REQUIREMENTS
Trip Blank			9/9/93	~~1400~~			2					✓								✓					
FD-1/A			9/9/93	940			4					✓								✓					
FD-1/B			"	950			4					✓								✓					
FD-1/C			"	1000			4					✓								✓					
FD-1/D			"	1010			4					✓								✓					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Carl Lomauro	9/9/93	1400					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Jodi Stacey	9/10/93	1000	

*Homogenize all composite samples prior to analysis

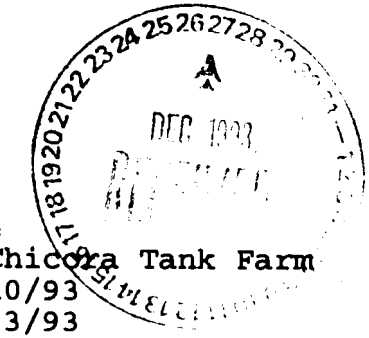
White – Lab Yellow – Office Pink – Field

APPENDIX F

Fourth Quarter Groundwater Laboratory Results, December 1993

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071



KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Andrew Clark
Invoice Number:

Order #: N3-12-231
Date: 12/23/93 08:44
Work ID: 6544/Navy-Chicora Tank Farm
Date Received: 12/10/93
Date Completed: 12/23/93
Client Code: KEMRON_ATL

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	MW-2
02	MW-3
03	MW-7
04	MW-11
05	FD-3
06	FD-1A
07	MW-12
08	EQB.
09	MW-4
10	MW-5
11	MW-6
12	MW-8
13	FD-2A
14	Trip Blank

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON
ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample: 10A MW-5 **Collected: 12/09/93** **Category: WATER**
Job: MET8 RCRA Metals - Water

Test Description	Result	Det Limit	Units	Analyzed	By
Arsenic, Total	0.013	0.004	mg/L As	12/14/93	JEC
Barium, Total	0.18	0.01	mg/L Ba	12/14/93	JBC
Cadmium, Total	<0.01	0.01	mg/L Cd	12/14/93	JBC
Chromium, Total	0.06	0.02	mg/L Cr	12/14/93	JBC
Lead, Total	0.012	0.005	mg/L Pb	12/14/93	TAS
Mercury, Total	<0.0002	0.0002	mg/L Hg	12/15/93	TAS
Selenium, Total	<0.004	0.004	mg/L Se	12/15/93	JKM
Silver, Total	<0.01	0.01	mg/L Ag	12/14/93	JBC

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-2** Collected: **12/08/93 15:44** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **01A** Category: **WATER**

ANALYST: MBJ FILE #: 010F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-2** Collected: **12/08/93 15:44** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 020F0101
INSTRMT: HP_II INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	18 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-2** Collected: **12/08/93 15:44** Method:
Test Description: **Library Search - BNA** Test Code: **M827LS** Lab No: **01C** Category: **WATER**

NBS LIBRARY SEARCH - SEMIVOLATILE COMPOUNDS

CAS#	COMPOUND	SCAN#	EST CONC. ug/L
	Unknown	350	21
14003-71-5	1,2,3,4-Cyclopentanetetrol, (1.alpha.,2.beta.,3.beta.,-4.alpha) or isomer	915	14
	Unknown	1058	40
	Unknown	1361	21

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-2** Collected: **12/08/93 15:44** Method: **8270**
Test Description: **Semivolatile Compounds** Test Code: **M8270** Lab No: **01C** Category: **WATER**

ANALYST: MDC EXTRACTED: 12/13/93 FILE #: 4AT13653
INSTRMT: FINN4 INJECTED: 12/17/93 FACTOR: 2 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
108-95-2	Phenol	ND	10
111-44-4	bis(2-Chloroethyl)ether	ND	10
95-57-8	2-Chlorophenol	ND	10
541-73-1	1,3-Dichlorobenzene	ND	10
106-46-7	1,4-Dichlorobenzene	ND	10
100-51-6	Benzyl alcohol	ND	10
95-50-1	1,2-Dichlorobenzene	ND	10
95-48-7	2-Methylphenol	ND	10
108-60-1	bis(2-Chloroisopropyl)ether	ND	10
106-44-5	4-Methylphenol	ND	10
621-64-7	N-Nitroso-di-n-propylamine	ND	10
67-72-1	Hexachloroethane	ND	10
98-95-3	Nitrobenzene	ND	10
78-59-1	Isophorone	ND	10
88-75-5	2-Nitrophenol	ND	10
105-67-9	2,4-Dimethylphenol	ND	10
65-85-0	Benzoic acid	ND	50
111-91-1	bis(2-Chloroethoxy)methane	ND	10
120-83-2	2,4-Dichlorophenol	ND	10
120-82-1	1,2,4-Trichlorobenzene	ND	10
91-20-3	Naphthalene	ND	10
106-47-8	4-Chloroaniline	ND	10
87-68-3	Hexachlorobutadiene	ND	10
59-50-7	4-Chloro-3-methylphenol	ND	10
91-57-6	2-Methylnaphthalene	ND	10
77-47-4	Hexachlorocyclopentadiene	ND	10
88-06-2	2,4,6-Trichlorophenol	ND	10
95-95-4	2,4,5-Trichlorophenol	ND	50
91-58-7	2-Chloronaphthalene	ND	10
88-74-4	2-Nitroaniline	ND	50
131-11-3	Dimethylphthalate	ND	10
208-96-8	Acenaphthylene	ND	10
606-20-2	2,6-Dinitrotoluene	ND	10

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-2** Collected: **12/08/93 15:44** Method: **8270**
Test Description: **Semivolatile Compounds** Test Code: **M8270** Lab No: **01C** Category: **WATER**

CAS#	COMPOUND	RESULT	DET LIMIT
99-09-2	3-Nitroaniline	ND	50
83-32-9	Acenaphthene	ND	10
51-28-5	2,4-Dinitrophenol	ND	50
100-02-7	4-Nitrophenol	ND	50
132-64-9	Dibenzofuran	ND	10
121-14-2	2,4-Dinitrotoluene	ND	10
84-66-2	Diethylphthalate	ND	10
7005-72-3	4-Chlorophenyl-phenyl ether	ND	10
86-73-7	Fluorene	ND	10
100-01-6	4-Nitroaniline	ND	50
534-52-1	4,6-Dinitro-2-methylphenol	ND	50
86-30-6	N-Nitrosodiphenylamine	ND	10
101-55-3	4-Bromophenyl-phenylether	ND	10
118-74-1	Hexachlorobenzene	ND	10
87-86-5	Pentachlorophenol	ND	50
85-01-8	Phenanthrene	ND	10
120-12-7	Anthracene	ND	10
84-74-2	Di-n-butylphthalate	ND	10
206-44-0	Fluoranthene	ND	10
129-00-0	Pyrene	ND	10
85-68-7	Butylbenzylphthalate	ND	10
91-94-1	3,3-Dichlorobenzidine	ND	20
56-55-3	Benzo(a)anthracene	ND	10
218-01-9	Chrysene	ND	10
117-81-7	bis(2-Ethylhexyl)phthalate	ND	10
117-84-0	Di-n-octylphthalate	ND	10
205-99-2	Benzo(b)fluoranthene	ND	10
207-08-9	Benzo(k)fluoranthene	ND	10
50-32-8	Benzo(a)pyrene	ND	10
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10
53-70-3	Dibenzo(a,h)anthracene	ND	10
191-24-2	Benzo(g,h,i)perylene	ND	10

Sample Description: **MW-2** Collected: **12/08/93 15:44** Method: **8270**
Test Description: **Semivolatile Compounds** Test Code: **M8270** Lab No: **01C** Category: **WATER**

SURROGATES

2-Fluorophenol	64 % Recovery	2-Fluorobiphenyl	81 % Recovery
Phenol-d6	67 % Recovery	2,4,6-Tribromophenol	78 % Recovery
Nitrobenzene-d5	79 % Recovery	p-Terphenyl-d14	17 * % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED
DL = DILUTED OUT
* = SAMPLE MATRIX INTERFERENCE

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-3** Collected: **12/09/93 09:00** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02A** Category: **WATER**

ANALYST: MBJ FILE #: 011F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	93 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-3** Collected: **12/09/93 09:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 026F0101
INSTRMT: HP_II INJECTED: 12/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	46 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-7** Collected: **12/08/93 17:05** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03A** Category: **WATER**

ANALYST: MBJ FILE #: 013F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-7** Collected: **12/08/93 17:05** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 027F0101
INSTRMT: HP_II INJECTED: 12/18/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	42 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-11** Collected: **12/09/93 09:35** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04A** Category: **WATER**

ANALYST: MBJ FILE #: 014F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	101 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-11** Collected: **12/09/93 09:35** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 003F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	49	% Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **FD-3** Collected: **12/09/93 16:15** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05A** Category: **WATER**

ANALYST: MBJ FILE #: 015F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-3** Collected: **12/09/93 16:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 011F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 10 * UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	10
208-96-8	Acenaphthylene	ND	10
83-32-9	Acenaphthene	ND	10
86-73-7	Fluorene	ND	10
85-01-8	Phenanthrene	ND	10
120-12-7	Anthracene	ND	10
206-44-0	Fluoranthene	ND	10
129-00-0	Pyrene	ND	10
56-55-3	Benzo(a)anthracene	ND	50
218-01-9	Chrysene	ND	50
205-99-2	Benzo(b)fluoranthene	ND	50
207-08-9	Benzo(k)fluoranthene	ND	50
50-32-8	Benzo(a)pyrene	ND	50
193-39-5	Indeno(1,2,3-cd)pyrene	ND	50
53-70-3	Dibenzo(a,h)anthracene	ND	50
191-24-2	Benzo(g,h,i)perylene	ND	50

SURROGATES

2-methyl-naphthalene	44	% Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
* = ELEVATED DETECTION LIMITS DUE TO SAMPLE MATRIX

Sample Description: **FD-3** Collected: **12/09/93 16:15** Method:
Test Description: **Library Search - BNA** Test Code: **M827LS** Lab No: **05C** Category: **WATER**

NBS LIBRARY SEARCH - SEMIVOLATILE COMPOUNDS

CAS#	COMPOUND	SCAN#	EST CONC. ug/L
	Unknown	864	53
	Unknown hydrocarbon	885	46
	Unknown hydrocarbon	891	50
	Unknown	902	78
	Unknown hydrocarbon	911	26
	Unknown	917	80
	Unknown hydrocarbon	934	54
	Unknown	944	30
	Unknown	962	32
	Unknown	971	61
	Unknown	983	43
	Unknown	988	26
	Unknown	996	30
	Unknown	1000	30
	Unknown	1008	35
	Unknown hydrocarbon	1023	88
	Unknown hydrocarbon	1046	48
	Unknown	1052	24
	Unknown hydrocarbon	1058	192
	Unknown	1336	26

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-3** Collected: **12/09/93 16:15** Method: **8270**
Test Description: **Semivolatile Compounds** Test Code: **M8270** Lab No: **05C** Category: **WATER**

ANALYST: MDC EXTRACTED: 12/13/93 FILE #: 4AT13656
INSTRMT: FINN4 INJECTED: 12/17/93 FACTOR: 2 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
108-95-2	Phenol	ND	10
111-44-4	bis(2-Chloroethyl)ether	ND	10
95-57-8	2-Chlorophenol	ND	10
541-73-1	1,3-Dichlorobenzene	ND	10
106-46-7	1,4-Dichlorobenzene	ND	10
100-51-6	Benzyl alcohol	ND	10
95-50-1	1,2-Dichlorobenzene	ND	10
95-48-7	2-Methylphenol	ND	10
108-60-1	bis(2-Chloroisopropyl)ether	ND	10
106-44-5	4-Methylphenol	ND	10
621-64-7	N-Nitroso-di-n-propylamine	ND	10
67-72-1	Hexachloroethane	ND	10
98-95-3	Nitrobenzene	ND	10
78-59-1	Isophorone	ND	10
88-75-5	2-Nitrophenol	ND	10
105-67-9	2,4-Dimethylphenol	ND	10
65-85-0	Benzoic acid	ND	50
111-91-1	bis(2-Chloroethoxy)methane	ND	10
120-83-2	2,4-Dichlorophenol	ND	10
120-82-1	1,2,4-Trichlorobenzene	ND	10
91-20-3	Naphthalene	ND	10
106-47-8	4-Chloroaniline	ND	10
87-68-3	Hexachlorobutadiene	ND	10
59-50-7	4-Chloro-3-methylphenol	ND	10
91-57-6	2-Methylnaphthalene	ND	10
77-47-4	Hexachlorocyclopentadiene	ND	10
88-06-2	2,4,6-Trichlorophenol	ND	10
95-95-4	2,4,5-Trichlorophenol	ND	50
91-58-7	2-Chloronaphthalene	ND	10
88-74-4	2-Nitroaniline	ND	50
131-11-3	Dimethylphthalate	ND	10
208-96-8	Acenaphthylene	ND	10
606-20-2	2,6-Dinitrotoluene	ND	10

Sample Description: **FD-3** Collected: **12/09/93 16:15** Method: **8270**
Test Description: **Semivolatile Compounds** Test Code: **M8270** Lab No: **05C** Category: **WATER**

CAS#	COMPOUND	RESULT	DET LIMIT
99-09-2	3-Nitroaniline	ND	50
83-32-9	Acenaphthene	ND	10
51-28-5	2,4-Dinitrophenol	ND	50
100-02-7	4-Nitrophenol	ND	50
132-64-9	Dibenzofuran	ND	10
121-14-2	2,4-Dinitrotoluene	ND	10
84-66-2	Diethylphthalate	ND	10
7005-72-3	4-Chlorophenyl-phenyl ether	ND	10
86-73-7	Fluorene	ND	10
100-01-6	4-Nitroaniline	ND	50
534-52-1	4,6-Dinitro-2-methylphenol	ND	50
86-30-6	N-Nitrosodiphenylamine	ND	10
101-55-3	4-Bromophenyl-phenylether	ND	10
118-74-1	Hexachlorobenzene	ND	10
87-86-5	Pentachlorophenol	ND	50
85-01-8	Phenanthrene	ND	10
120-12-7	Anthracene	ND	10
84-74-2	Di-n-butylphthalate	ND	10
206-44-0	Fluoranthene	ND	10
129-00-0	Pyrene	ND	10
85-68-7	Butylbenzylphthalate	ND	10
91-94-1	3,3-Dichlorobenzidine	ND	20
56-55-3	Benzo(a)anthracene	ND	10
218-01-9	Chrysene	ND	10
117-81-7	bis(2-Ethylhexyl)phthalate	ND	10
117-84-0	Di-n-octylphthalate	ND	10
205-99-2	Benzo(b)fluoranthene	ND	10
207-08-9	Benzo(k)fluoranthene	ND	10
50-32-8	Benzo(a)pyrene	ND	10
193-39-5	Indeno(1,2,3-cd)pyrene	ND	10
53-70-3	Dibenzo(a,h)anthracene	ND	10
191-24-2	Benzo(g,h,i)perylene	ND	10

Sample Description: **FD-3** Collected: **12/09/93 16:15** Method: **8270**
Test Description: **Semivolatile Compounds** Test Code: **M8270** Lab No: **05C** Category: **WATER**

SURROGATES

2-Fluorophenol	56 % Recovery	2-Fluorobiphenyl	108 % Recovery
Phenol-d6	57 % Recovery	2,4,6-Tribromophenol	72 % Recovery
Nitrobenzene-d5	83 % Recovery	p-Terphenyl-d14	29 * % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED
DL = DILUTED OUT
* = SAMPLE MATRIX INTERFERENCE

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1A** Collected: **12/09/93 14:55** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06A** Category: **WATER**

ANALYST: MBJ FILE #: 016F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 96 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1A** Collected: **12/09/93 14:55** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 004F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 33 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-12** Collected: **12/09/93 16:35** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07A** Category: **WATER**

ANALYST: MBJ FILE #: 017F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	96 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-12** Collected: **12/09/93 16:35** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 005F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	29 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **EQB.** Collected: **12/09/93 14:45** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08A** Category: **WATER**

ANALYST: MBJ FILE #: 018F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **EQB.** Collected: **12/09/93 14:45** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **08B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 006F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	46 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-4** Collected: **12/08/93 16:23** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **09A** Category: **WATER**

ANALYST: MBJ FILE #: 019F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 94 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-4** Collected: **12/08/93 16:23** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **09B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 007F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	31 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **MW-5** Collected: **12/09/93 11:20** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **10B** Category: **WATER**

ANALYST: MBJ FILE #: 020F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	91 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW-5** Collected: **12/09/93 11:20** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **10C** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 008F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 47 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-6** Collected: **12/09/93 10:15** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **11A** Category: **WATER**

ANALYST: MBJ FILE #: 021F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	93 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW-6** Collected: **12/09/93 10:15** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **11B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 009F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	36 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-8** Collected: **12/09/93 12:05** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **12A** Category: **WATER**

ANALYST: MBJ FILE #: 022F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	93 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW-8** Collected: **12/09/93 12:05** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **12B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/14/93 FILE #: 010F0101
INSTRMT: HP_II INJECTED: 12/20/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	51 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

Sample Description: **FD-2A** Collected: **12/09/93 15:50** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **13A** Category: **WATER**

ANALYST: MBJ FILE #: 004F0101
INSTRMT: HP_III INJECTED: 12/19/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	98 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **Trip Blank** Collected: **12/09/93** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **14A** Category: **WATER**

ANALYST: MBJ FILE #: 005F0101
INSTRMT: HP_III INJECTED: 12/19/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 98 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

EPA Method 239.2/SW7421 (GFAA) - Lead

SW-846 METHOD SW7740 - Selenium (GFAA)

EPA Method 200.7 (ICP) - Silver

EPA Method 200.7/SW6010 (ICP) - Barium

EPA Method 200.7/SW6010 (ICP) - Cadmium

EPA Method 200.7/SW6010 (ICP) - Chromium

EPA Method SW3005 and/or SW3020 - Metals Digestion

SW-846 METHOD SW7060 - Arsenic (GFAA)

EPA Method 245.1/SW7470 (Cold Vapor) - Mercury

SW-846 Method 8100 - Polyaromatic Hydrocarbons

SW-846 Method 8270

EPA Method 602/SW8020 GC/PID Volatile Aromatics

KEMRON ANALYST LIST

Ohio Valley Laboratory

11/01/93

BAR - - Beth A. Raper
CAG - - C. Arthur Gray III
CAK - - Cheryl A. Koelsch
CEB - - Chad E. Barnes
DAM - - Dan A. Musgrave
DAR - - Dave A. Reed
DCP - - Daniel C. Peders
DIH - - Deanna I. Hesson
DJP - - Douglas J. Pohling
DLP - - Dorothy L. Payne
DST - - Dennis S. Tepe
ECL - - Eric C. Lawson
EDG - - Eric D. Gerkin
EMG - - Eric M. Graban
FEH - - Fay E. Harmon
FRM - - Fred R. Montgomery
GWH - - George W. Hutchison
GSS - - Greg S. Smith
HV - - Hema Vilasagar
JAS - - Juanna A. Schafer
JBC - - Jim B. Crawford
JEC - - Jesse E. Chapman
JKM - - June K. Morris
JLH - - Janice L. Holland
JWR - - John W. Richards
KHA - - Kim H. Archer
KMM - - Kevin M. McDonald
KPO - - Kevin P. Overstreet
LSB - - Leslie S. Bucina
MAH - - Mary A. Haider
MBJ - - Matthew B. Jarrell
MDC - - Michael D. Cochran
MMB - - Maren M. Burchfield
PDL - - Patricia D. Lane
PJW - - Pamela J. Weber
PNW - - Phillip N. Wright
REB - - Russell E. Burton
RKA - - Robert K. Archer
RWC - - Rodney W. Campbell
SCW - - Stephen C. West
SDF - - Scott D. Frum
SLM - - Stephanie L. Mossburg
SMC - - Susan M. Cunningham
SPL - - Steve P. Learn
TAS - - Tamela A. Sams
TKT - - Tonya K. Troutner
TLD - - Teresa L. Davis
WCD - - Wade C. Dawson

Kemron
ENVIRONMENTAL SERVICES

№ 31626

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: Normal

Project No.: 6544 | Project Name: NAVY-Chicora Charleston, S.C.

Sampler (print): T. Morrissey | Signature:

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	BTEX	PAH 8100	Spec. Vol 8270 + Lib Search	ADDITIONAL REQUIREMENTS
MW-2		X	12-8-93	1549		X	6		X	X	X	
MW-3		X	12-9-93	900		X	4		X	X		
MW-7		X	12-8-93	1705		X	4		X	X		
MW-11		X	12-9-93	935		X	4		X	X		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	12-9-93	1800					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Jodi Steven	12/10/93	10:5-	

*Homogenize all composite samples prior to analysis

White – Lab Yellow – Office Pink – Field

Kemron
ENVIRONMENTAL SERVICES

№ 1627

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Project Contact: Andrew Clark

Turn Around Requirements: Normal

Project No.: 6544 | Project Name: Navy - Chicora Tank Farm

Sampler (print): T. Morrissey | Signature:

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	BTEX	PAH 8100	8270 Semi-Vol + Library Search	ADDITIONAL REQUIREMENTS
FD-3		X	12-9-93	1615		X	6		2	2	2	
FD-1A		X	12-9-93	1455		X	4		2	2		
MW-12		X	12-9-93	1635		X	4		2	2		
EQB		X	12-9-93	1445		X	4		2	2		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	12/9/93	1800					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Jodi Stover	12/10/93	1045	

*Homogenize all composite samples prior to analysis

White – Lab – Office Pink – Field

Kemron
ENVIRONMENTAL SERVICES

№ 1628

CHAIN-OF-CUSTODY RECORD

Page 1 of

Project Contact: Andrew Clark

Turn Around Requirements: Normal

Project No.: 6544

Project Name: NAVY - Chicora Tank Farm

Sampler (print): T. Morrissey

Signature:

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	BTEX	PAH 8100	Semi Vol. 8270	RCRA Metals	ADDITIONAL REQUIREMENTS
MW-4		X	12-8-93	1623		X	4		2	2			
MW-5		X	12-9-93	1120		X	5		2	2		1	
MW-6		X	12-9-93	1015		X	4		2	2			
MW-8		X	12-9-93	1205		X	4		2	2			
FD-2A		X	12-9-93	1550		X	2		2				
Trip Blank		X	12-8-93 ~~1500~~ 12-9-93			X	2		2				

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
	12/9/93	1800					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:
			Jodi Stevens	12/14/93	1015	

*Homogenize all composite samples prior to analysis

White – Lab Yellow – Office Pink – Field

KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

Phone: (614) 373-4071

KEMRON Environmental Services
2987 Clairmont Rd.
Suite 150
Atlanta,GA 30329
Attn: Andrew Clark
Invoice Number:

Order #: N3-12-230
Date: 12/21/93 11:14
Work ID: 6544/Navy-Chicora Tank Farm
Date Received: 12/10/93
Date Completed: 12/21/93
Client Code: KEMRON_ATL

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	MW-10
02	MW-9
03	MW-1
04	FD-1B
05	FD-1C
06	FD-1D
07	FD-2C
08	FD-2B
09	FD-2A

All results on soils/sludges are reported "AS RECEIVED" unless otherwise specified. This report shall not be reproduced except in full, without the written approval of KEMRON.

Certified By
Leslie Bucina

KEMRON ENVIRONMENTAL SERVICES

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-10**
Test Description: **Volatile Organics (BETX)**

Collected: **12/09/93 12:46** Method: **8020**
Test Code: **BETX5** Lab No: **01A** Category: **WATER**

ANALYST: MBJ
INSTRMT: HP_III INJECTED: 12/17/93

FILE #: 024f0101
FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES

a,a,a-trifluorotoluene	92 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW-10** Collected: **12/09/93 12:46** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **01B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 022F0101
INSTRMT: HP_II INJECTED: 12/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	60 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-9** Collected: **12/09/93 14:30** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **02A** Category: **WATER**

ANALYST: MBJ FILE #: 004F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **MW-9** Collected: **12/09/93 14:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **02B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 023F0101
INSTRMT: HP_II INJECTED: 12/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 55 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-1** Collected: **12/09/93 17:20** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **03A** Category: **WATER**

ANALYST: MBJ FILE #: 026F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES
a,a,a-trifluorotoluene 84 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **MW-1** Collected: **12/09/93 17:20** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **03B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 024F0101
INSTRMT: HP_II INJECTED: 12/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	52 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1B** Collected: **12/09/93 15:10** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **04A** Category: **WATER**

ANALYST: MBJ FILE #: 027F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 94 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1B** Collected: **12/09/93 15:10** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **04B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 025F0101
INSTRMT: HP_II INJECTED: 12/16/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 56 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1C** Collected: **12/09/93 15:20** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **05A** Category: **WATER**

ANALYST: MBJ FILE #: 028F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	ND	5.0
100-41-4	Ethylbenzene	ND	5.0
108-88-3	Toluene	ND	5.0
1330-20-7	Xylenes, Total	ND	5.0

SURROGATES
a,a,a-trifluorotoluene 88 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1C** Collected: **12/09/93 15:20** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **05B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 026F0101
INSTRMT: HP_II INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	59 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-1D** Collected: **12/09/93 15:30** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **06A** Category: **WATER**

ANALYST: MBJ FILE #: 005F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 100 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-1D** Collected: **12/09/93 15:30** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **06B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 027F0101
INSTRMT: HP_II INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES
2-methyl-naphthalene 53 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2C** Collected: **12/09/93 16:10** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **07A** Category: **WATER**

ANALYST: MBJ FILE #: 006F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES
a,a,a-trifluorotoluene 97 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

Sample Description: **FD-2C** Collected: **12/09/93 16:10** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **07B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 028F0101
INSTRMT: HP_II INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	73 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2B** Collected: **12/09/93 16:00** Method: **8020**
Test Description: **Volatile Organics (BETX)** Test Code: **BETX5** Lab No: **08A** Category: **WATER**

ANALYST: MBJ FILE #: 007F0101
INSTRMT: HP_III INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	MDL
71-43-2	Benzene	**ND**	5.0
100-41-4	Ethylbenzene	**ND**	5.0
108-88-3	Toluene	**ND**	5.0
1330-20-7	Xylenes, Total	**ND**	5.0

SURROGATES

a,a,a-trifluorotoluene	94 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE.
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)
NA = NOT ANALYZED

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2B** Collected: **12/09/93 16:00** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **08B** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 029F0101
INSTRMT: HP_II INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	74 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

KEMRON ENVIRONMENTAL SERVICES
TEST RESULTS BY SAMPLE

Sample Description: **FD-2A** Collected: **12/09/93 15:50** Method: **8100**
Test Description: **Polyaromatic Hydrocarbons** Test Code: **M8100** Lab No: **09A** Category: **WATER**

ANALYST: HV EXTRACTED: 12/10/93 FILE #: 030F0101
INSTRMT: HP_II INJECTED: 12/17/93 FACTOR: 1 UNITS: ug/L VERIFIED: RJW

CAS#	COMPOUND	RESULT	DET LIMIT
91-20-3	Naphthalene	ND	1
208-96-8	Acenaphthylene	ND	1
83-32-9	Acenaphthene	ND	1
86-73-7	Fluorene	ND	1
85-01-8	Phenanthrene	ND	1
120-12-7	Anthracene	ND	1
206-44-0	Fluoranthene	ND	1
129-00-0	Pyrene	ND	1
56-55-3	Benzo(a)anthracene	ND	5
218-01-9	Chrysene	ND	5
205-99-2	Benzo(b)fluoranthene	ND	5
207-08-9	Benzo(k)fluoranthene	ND	5
50-32-8	Benzo(a)pyrene	ND	5
193-39-5	Indeno(1,2,3-cd)pyrene	ND	5
53-70-3	Dibenzo(a,h)anthracene	ND	5
191-24-2	Benzo(g,h,i)perylene	ND	5

SURROGATES

2-methyl-naphthalene	82 % Recovery

NOTES AND DEFINITIONS FOR THIS SAMPLE
DET LIMIT = DETECTION LIMIT
ND = NOT DETECTED AT OR ABOVE THE METHOD DETECTION LIMIT (MDL)

SW-846 Method 8100 - Polyaromatic Hydrocarbons

EPA Method 602/SW8020 GC/PID Volatile Aromatics

KEMRON ANALYST LIST

Ohio Valley Laboratory

11/01/93

BAR - - Beth A. Raper
CAG - - C. Arthur Gray III
CAK - - Cheryl A. Koelsch
CEB - - Chad E. Barnes
DAM - - Dan A. Musgrave
DAR - - Dave A. Reed
DCP - - Daniel C. Peders
DIH - - Deanna I. Hesson
DJP - - Douglas J. Pohling
DLP - - Dorothy L. Payne
DST - - Dennis S. Tepe
ECL - - Eric C. Lawson
EDG - - Eric D. Gerkin
EMG - - Eric M. Graban
FEH - - Fay E. Harmon
FRM - - Fred R. Montgomery
GWH - - George W. Hutchison
GSS - - Greg S. Smith
HV - - Hema Vilasagar
JAS - - Juanna A. Schafer
JBC - - Jim B. Crawford
JEC - - Jesse E. Chapman
JKM - - June K. Morris
JLH - - Janice L. Holland
JWR - - John W. Richards
KHA - - Kim H. Archer
KMM - - Kevin M. McDonald
KPO - - Kevin P. Overstreet
LSB - - Leslie S. Bucina
MAH - - Mary A. Haider
MBJ - - Matthew B. Jarrell
MDC - - Michael D. Cochran
MMB - - Maren M. Burchfield
PDL - - Patricia D. Lane
PJW - - Pamela J. Weber
PNW - - Phillip N. Wright
REB - - Russell E. Burton
RKA - - Robert K. Archer
RWC - - Rodney W. Campbell
SCW - - Stephen C. West
SDF - - Scott D. Frum
SLM - - Stephanie L. Mossburg
SMC - - Susan M. Cunningham
SPL - - Steve P. Learn
TAS - - Tamela A. Sams
TKT - - Tonya K. Troutner
TLD - - Teresa L. Davis
WCD - - Wade C. Dawson

Kemron
ENVIRONMENTAL SERVICES

№ 01629

CHAIN-OF-CUSTODY RECORD

Project Contact: Andrew Clark

Turn Around Requirements: Normal

Project No.: 6544 | Project Name: Navy-Chicora Tank Farm

Sampler (print): T. Morrissey | Signature: [signature]

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	BTEX	PAH 8100	ADDITIONAL REQUIREMENTS
MW-10		X	12-9-93	~~12:45~~ 1225		X	4		2	2	
MW-9		X	12-9-93	~~1439~~ 1400		X	4		2	2	
MW-1		X	12-9-93	1720		X	4		2	2	
FD-1B		X	12-9-93	1510		X	4		2	2	
FD-1C		X	12-9-93	1520		X	4		2	2	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	12/9/93	1800					

Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks: ~~*~~ Collection Times per containers. Per clients request.
			Jackie Stowers	12/10/93	1015	

*Homogenize all composite samples prior to analysis

White – Lab Yellow – Office Pink – Field

Kemron
ENVIRONMENTAL SERVICES

№ 01633

CHAIN-OF-CUSTODY RECORD

Project Contact: ANDREW CLARK

Turn Around Requirements: Normal

Project No.: 6544 | Project Name: NAVY - Chicopa Tank Farm

Sampler (print): T. Morrissey | Signature: [signature]

Sample I.D. No.	Comp*	Grab	Date	Time	Protocol CWA	Protocol SW846	NUMBER OF SAMPLES	Hold	BTEX	PAH 8100	ADDITIONAL REQUIREMENTS
FD-1D		X	12-9-93	1530			4		2	2	
FD-2C		X	12-9-93	1610			4		2	2	
FD-2B		X	12-9-93	1600			4		2	2	
FD-2A		X	12-9-93	~~1545~~ 1550			2			2	

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Relinquished by: (Signature)	Date	Time	Received by: (Signature)
[signature]	12/9/93	1800					
Relinquished by: (Signature)	Date	Time	Received for Laboratory by: (Signature)	Date	Time	Remarks:	
			Jackie Stevens	12/10/93	1015	* Collection Time per container, per clients request.	

*Homogenize all composite samples prior to analysis

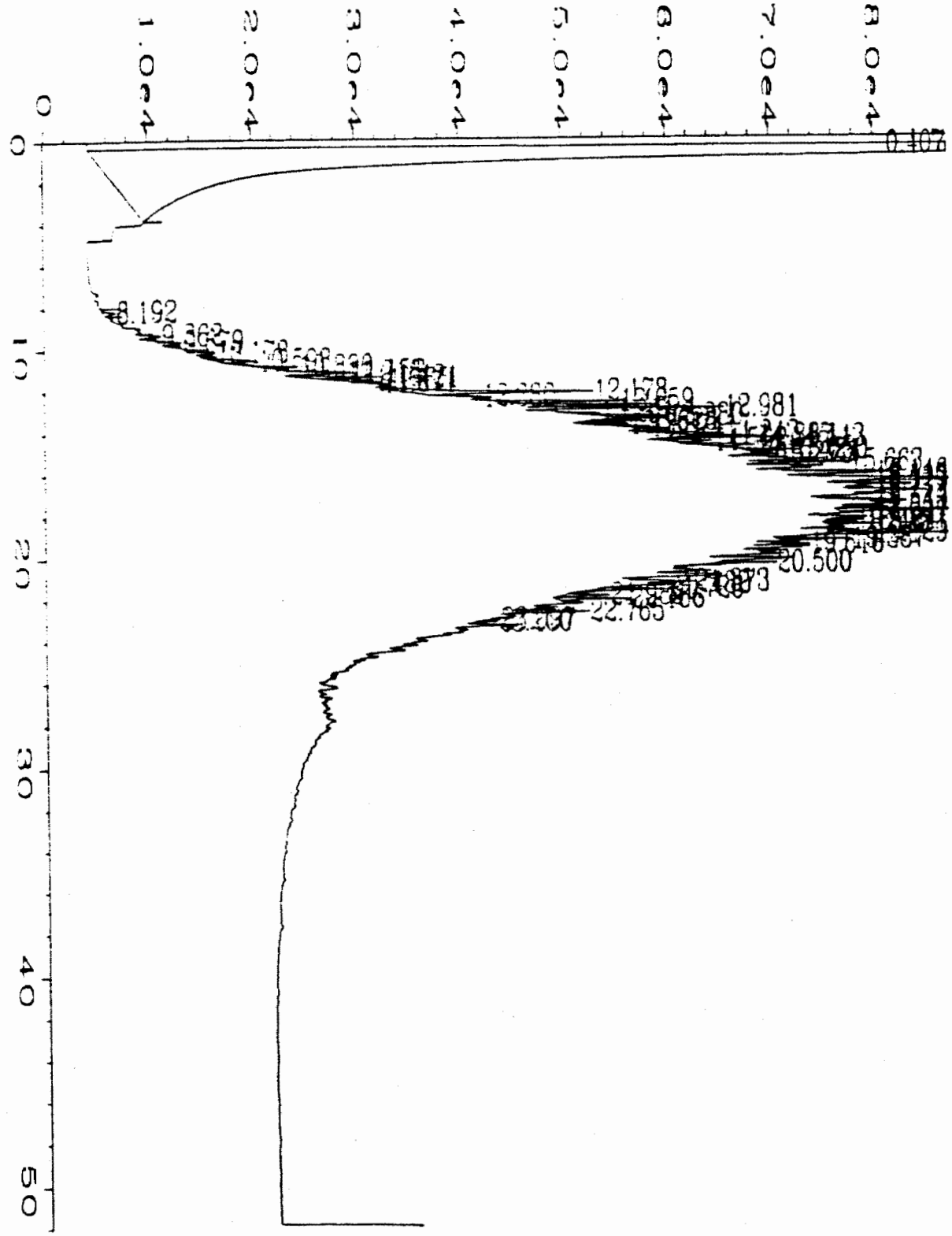
White – Lab Yellow – Office Pink – Field

KEMRON
ENVIRONMENTAL SERVICES

CASE NARRATIVE
WORK ORDER NO. N3-12-230 and N3-12-231

No difficulty was experienced in BETX5 or M8100 analysis of work order No. N3-12-230 which includes nine samples received on 12-10-93.

Similarly, no difficulty was experienced in BETX5, M8100 or M8270 analysis of workorder No. N3-12-231 which includes fourteen samples received on 12-10-93, with the exception of sample 05(FD-3). This sample exhibited an M8100 chromatogram typical of a hydrocarbon-type matrix necessitating analysis at a 10x dilution. The M8270 chromatogram exhibited a similar pattern. Mass spectral library search of the M8270 extract indicated that hydrocarbon-type compounds were present albeit at spectral purities too low for definitive identification. Please find enclosed M8100 and M8270 chromatograms and library search mass spectra for sample 05.



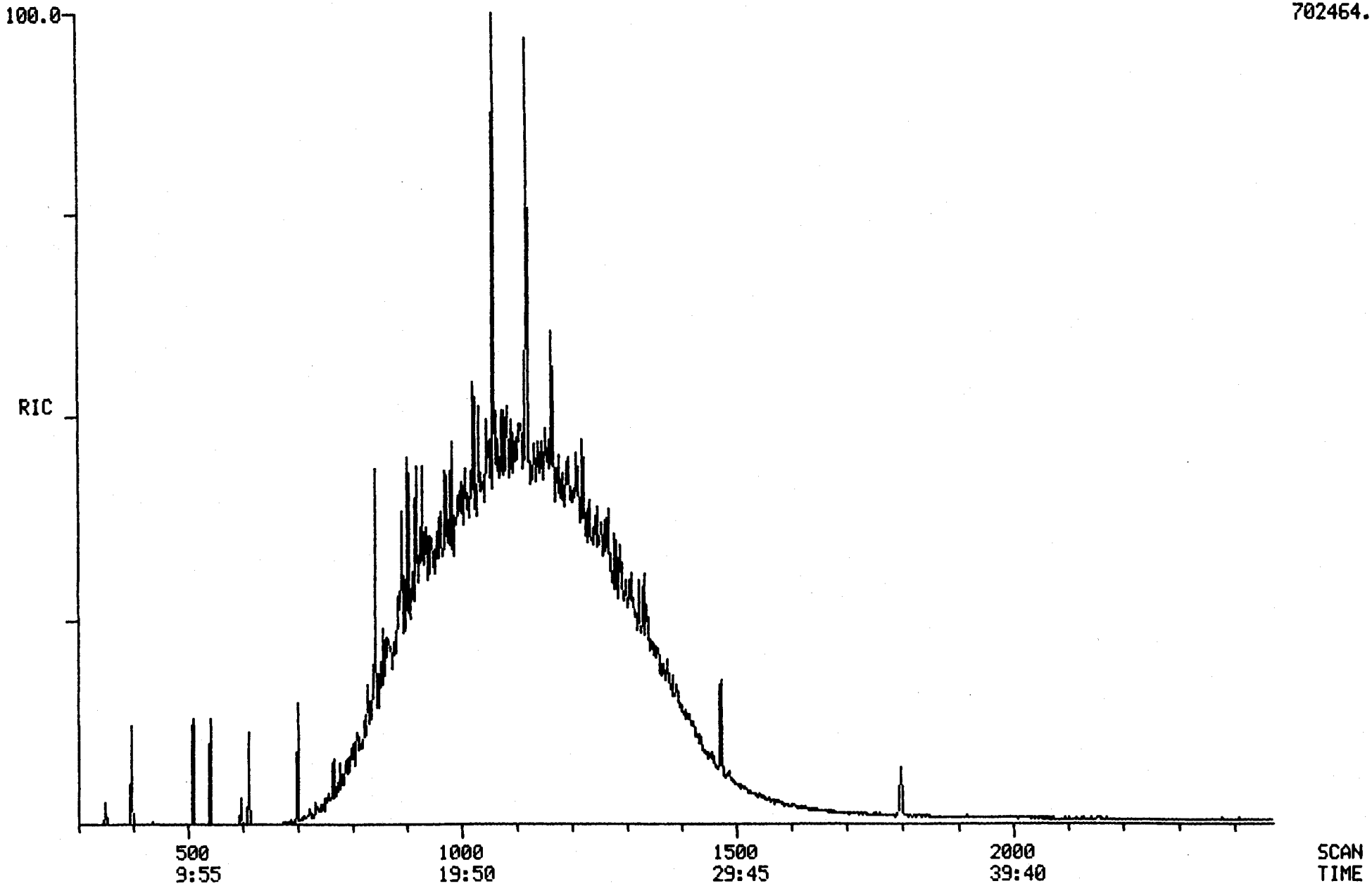
Data File Name : C:\HPCHEM\1\DATA\122093\011F0101.D
Operator : HEMA VILASAGAR
Instrument : HPII FID/
Sample Name : 12-231-05 PAH W
Data Time Bar Code:
Acquired on : 20 Dec 93 06:39 PM
Report Created on: 21 Dec 93 08:51 AM
Last Recalib on : 17 DEC 93 09:51 AM
Multiplier : 10

Page Number : 1
Vial Number : 11
Injection Number : 1
Sequence Line : 1
Instrument Method: 8100FRNT.M
Analysis Method : 8100FRNT.M
Sample Amount : 0
ISTD Amount :

RIC
12/17/93 18:15:00
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML
CONDS.:
RANGE: G 1,2470 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: 4AT13656 #1
CALI: 4AT13656 #3
BN:A 12/13

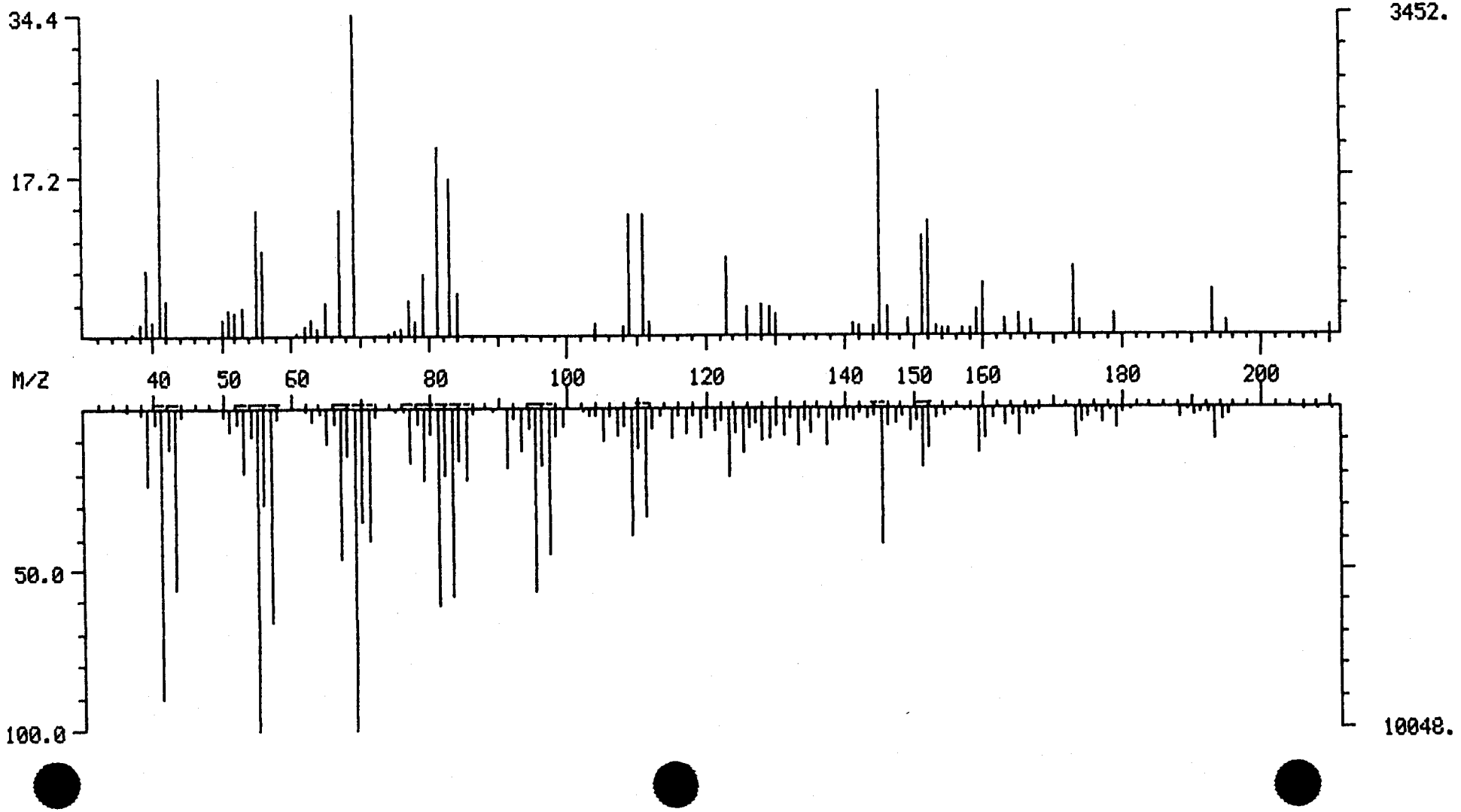
SCANS 300 TO 2470



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 17:08
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 170 DEG. C
ENHANCED (S 15B 2N 0T)

scan #

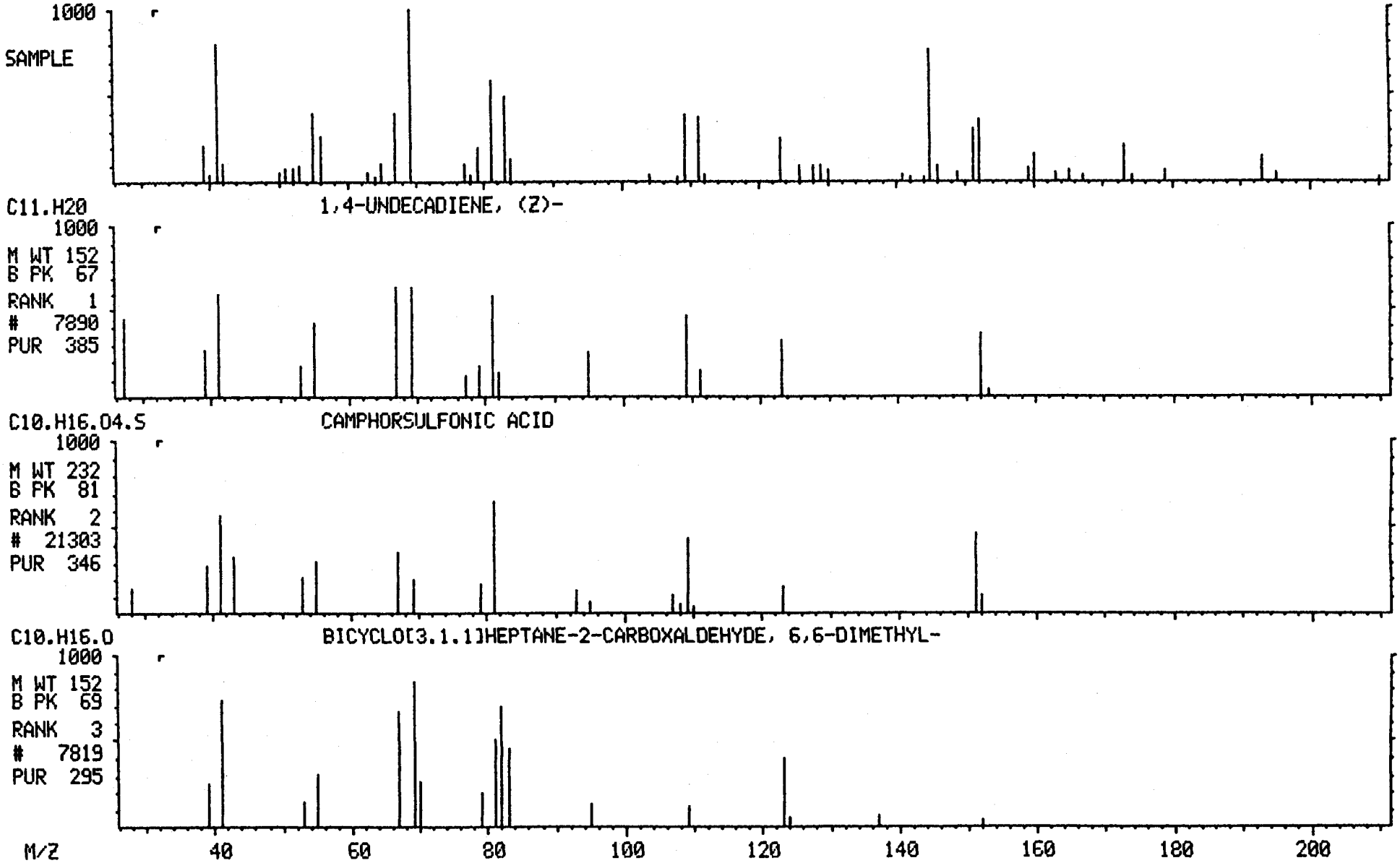
DATA: 4AT13656 #864 BASE M/Z: 69/ 69
CALI: 4AT13656 #3 RIC: 33152./ 161024.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 17:08
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 # 864
CALI: 4AT13656 # 3

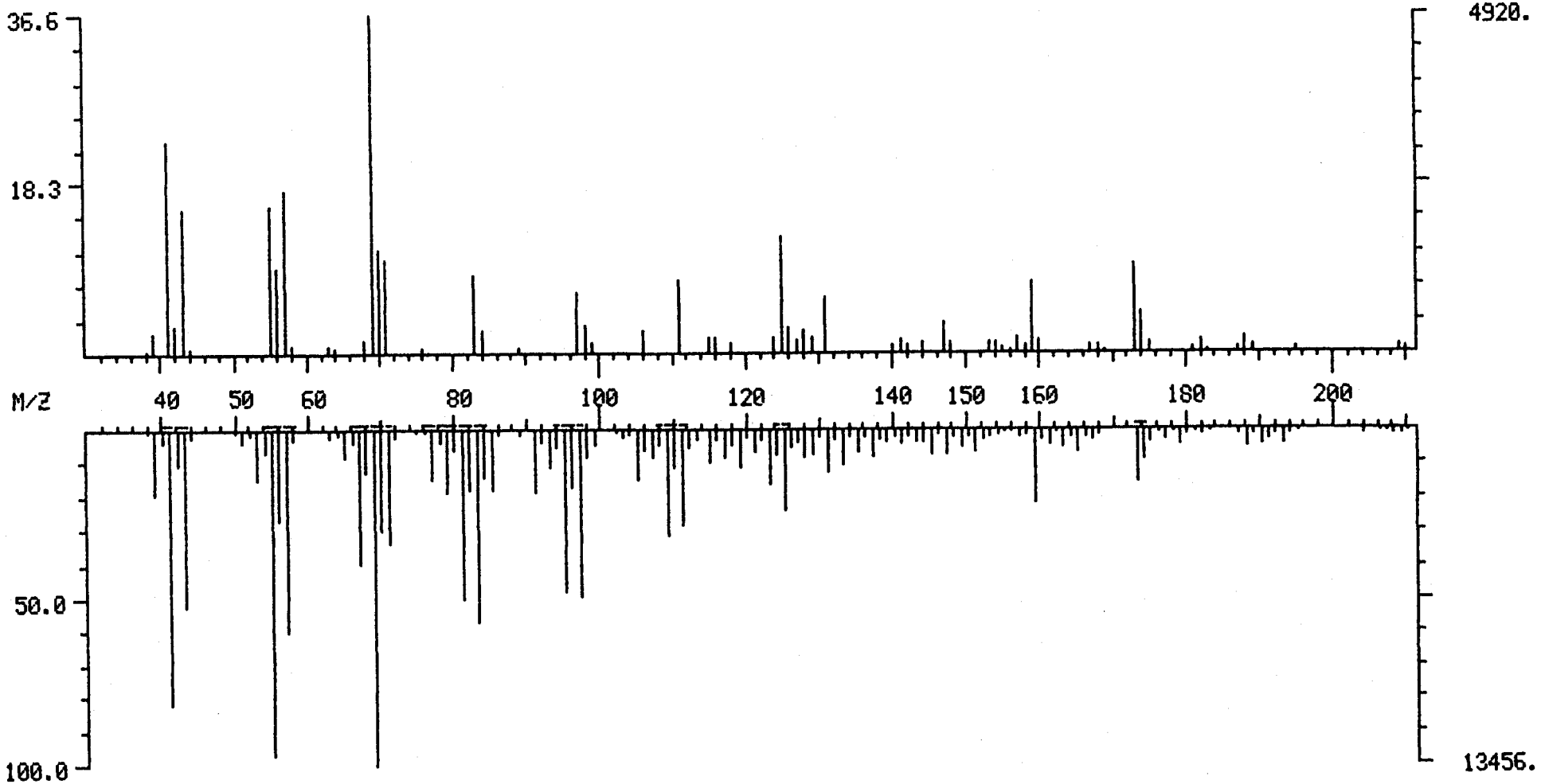
BASE M/Z: 69
RIC: 32256.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 17:33
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 174 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #885
CALI: 4AT13656 #3

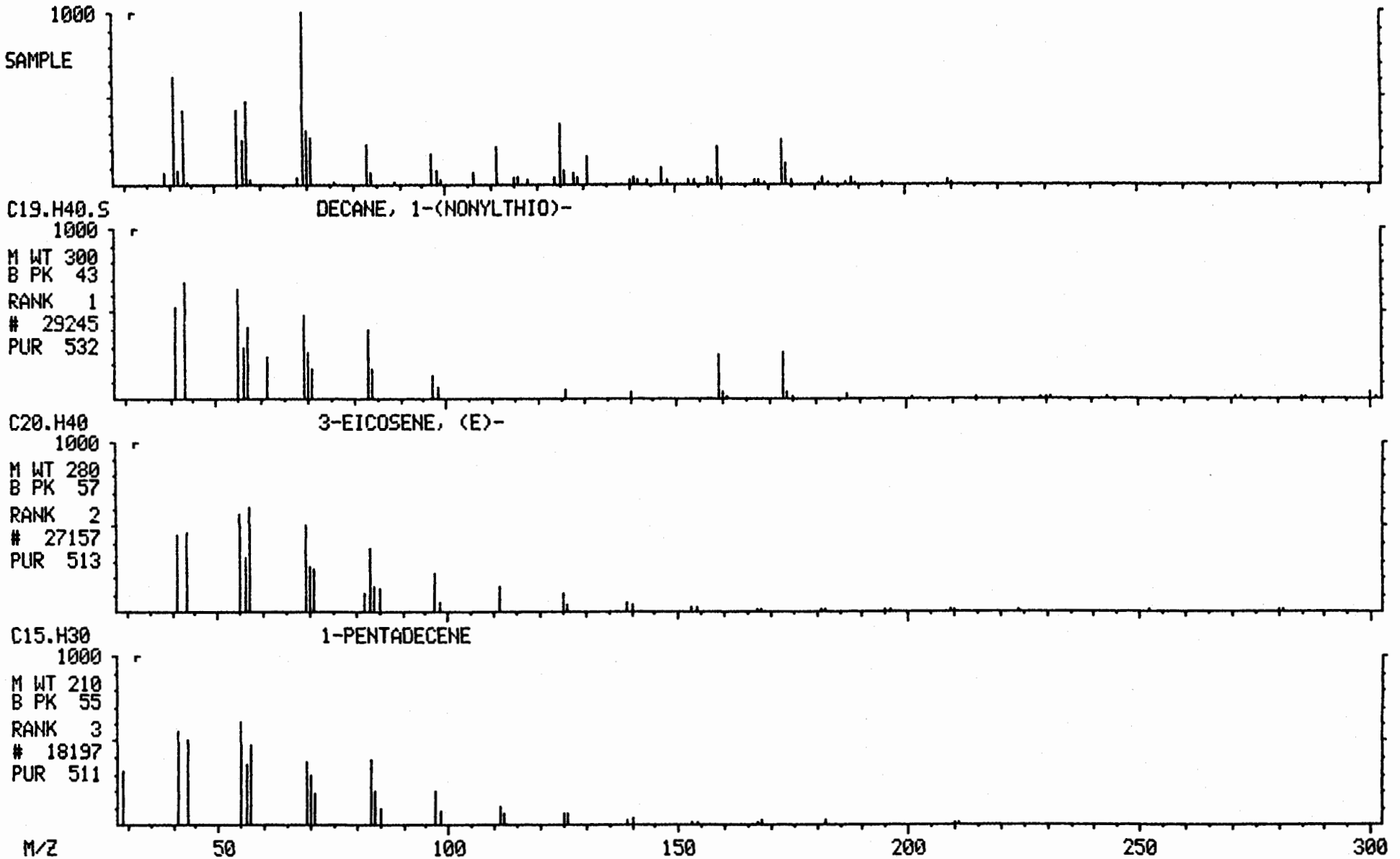
BASE M/Z: 69/ 69
RIC: 35072./ 197888.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 17:33
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

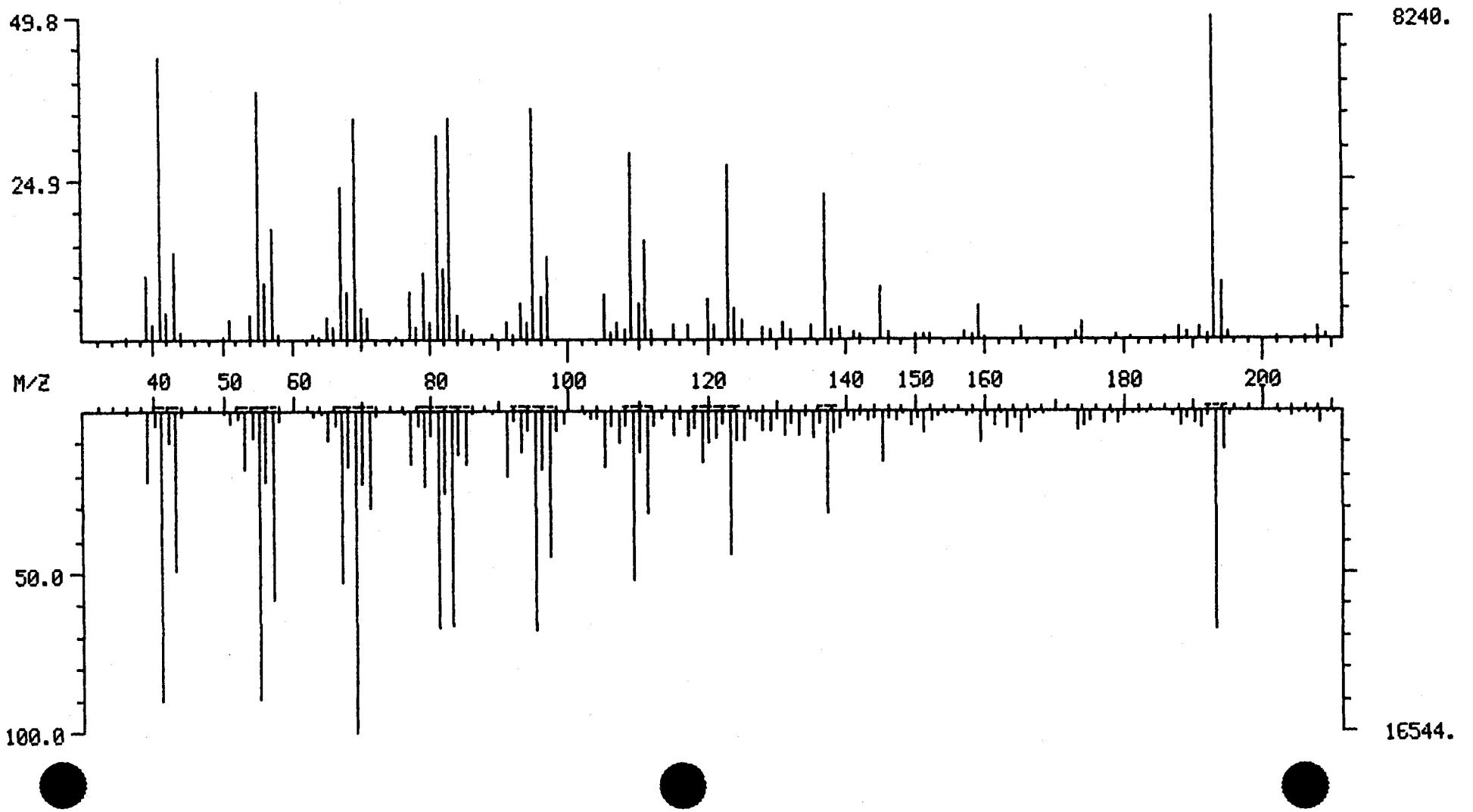
DATA: 4AT13656 # 885
CALI: 4AT13656 # 3

BASE M/Z: 69
RIC: 34560.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 17:40
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 175 DEG. C
ENHANCED (S 15B 2N 0T)

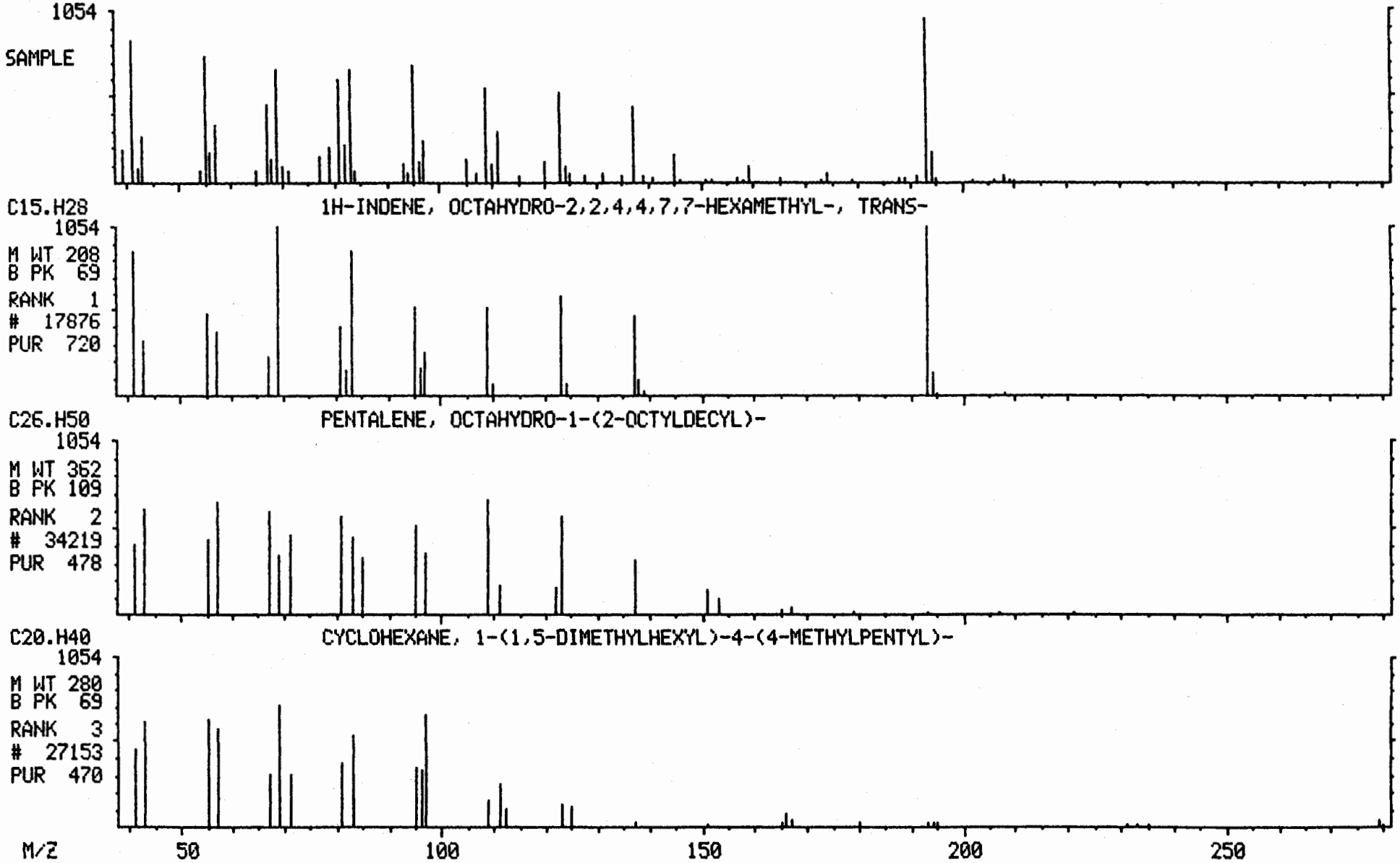
DATA: 4AT13656 #891 BASE M/Z: 193/ 69
CALI: 4AT13656 #3 RIC: 105856./ 267264.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 17:40
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

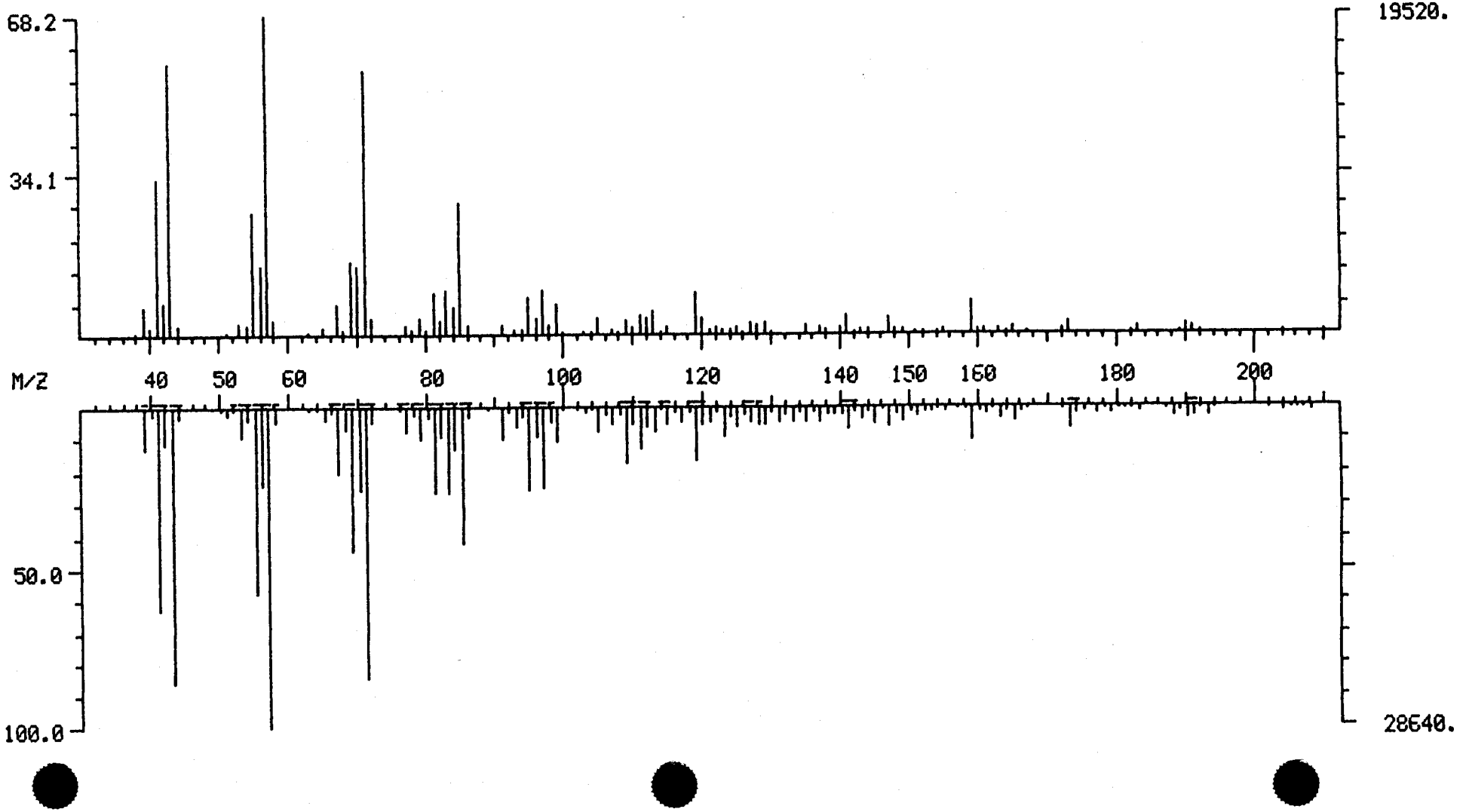
DATA: 4AT13656 # 891
CALI: 4AT13656 # 3

BASE M/Z: 193
RIC: 99712.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 17:54
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 178 DEG. C
ENHANCED (S 15B 2N 0T)

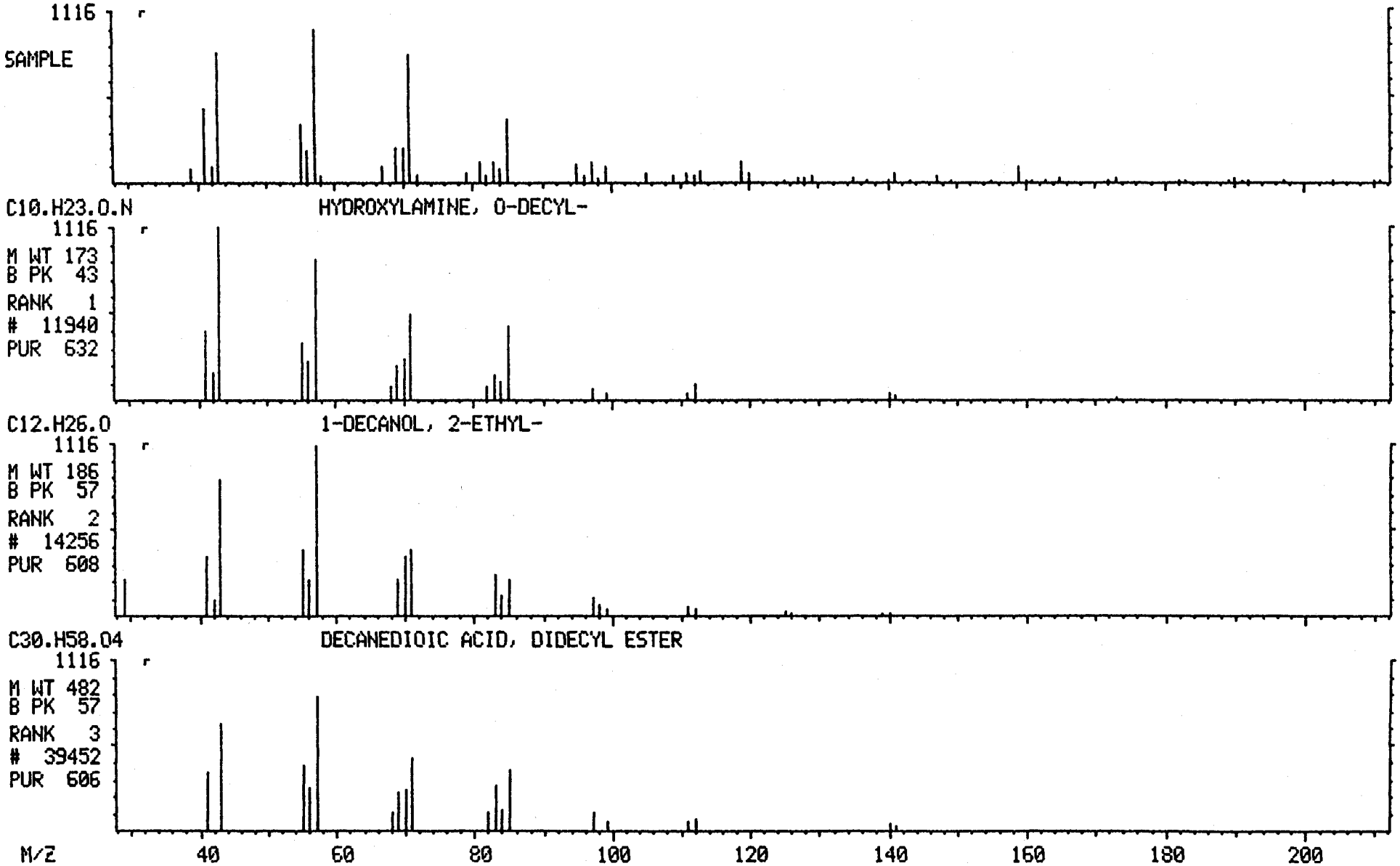
DATA: 4AT13656 #902 BASE M/Z: 57/ 57
CALI: 4AT13656 #3 RIC: 147968./ 315392.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 17:54
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

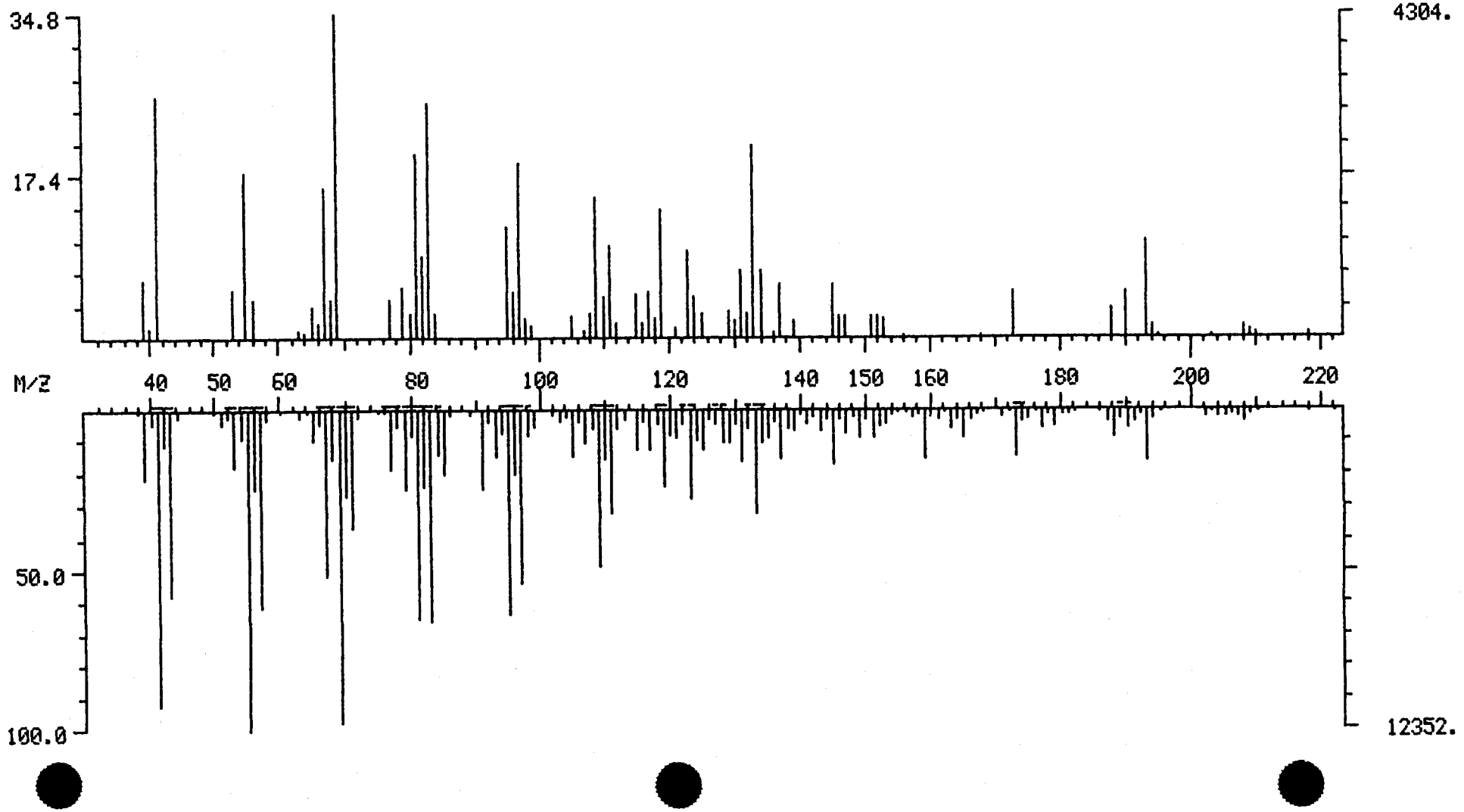
DATA: 4AT13656 # 902
CALI: 4AT13656 # 3

BASE M/Z: 57
RIC: 137472.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 18:04
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 179 DEG. C
ENHANCED (S 15B 2N 0T)

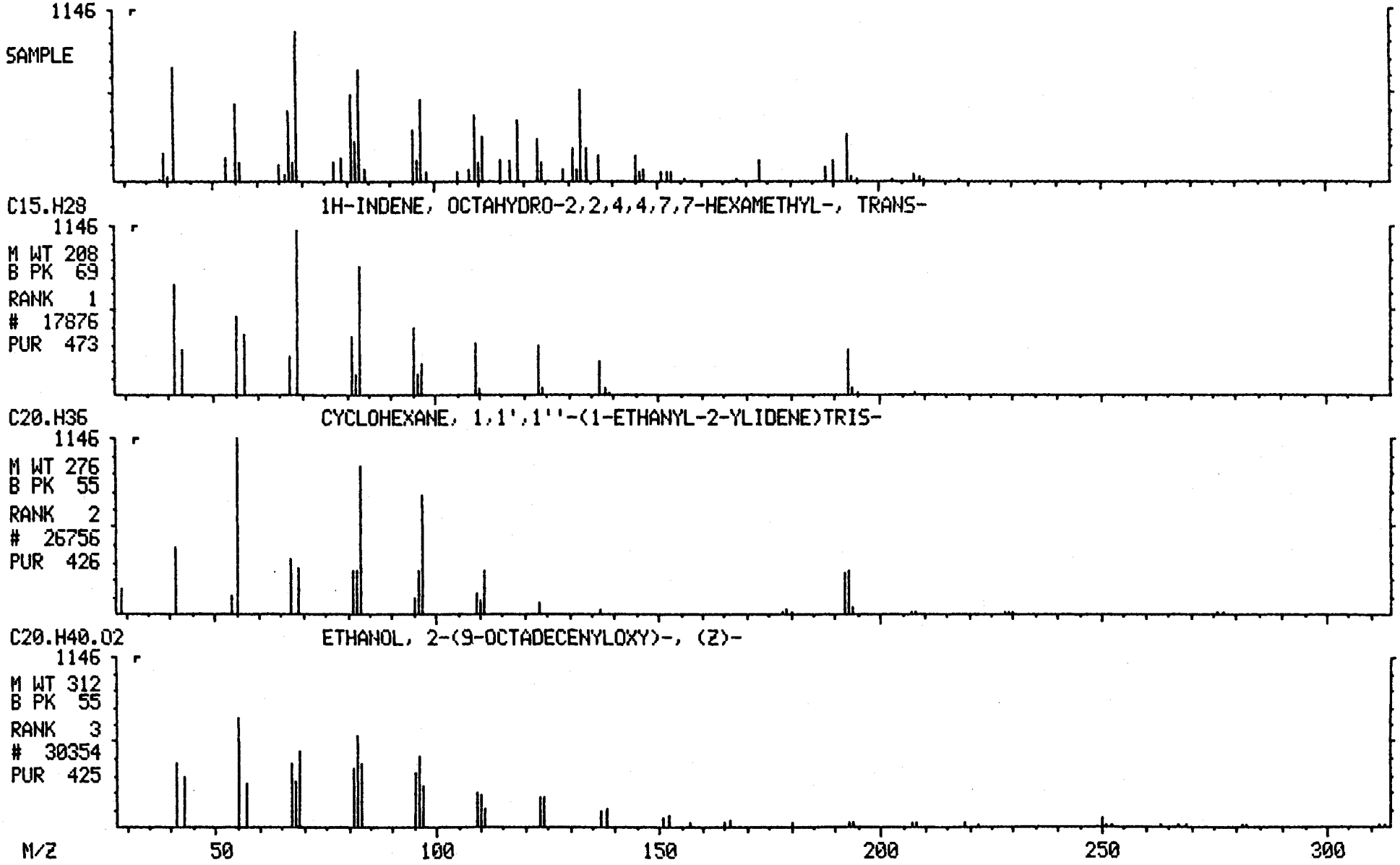
DATA: 4AT13656 #911 BASE M/Z: 69/ 55
CALI: 4AT13656 #3 RIC: 50624./ 216320.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 18:04
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 # 911
CALI: 4AT13656 # 3

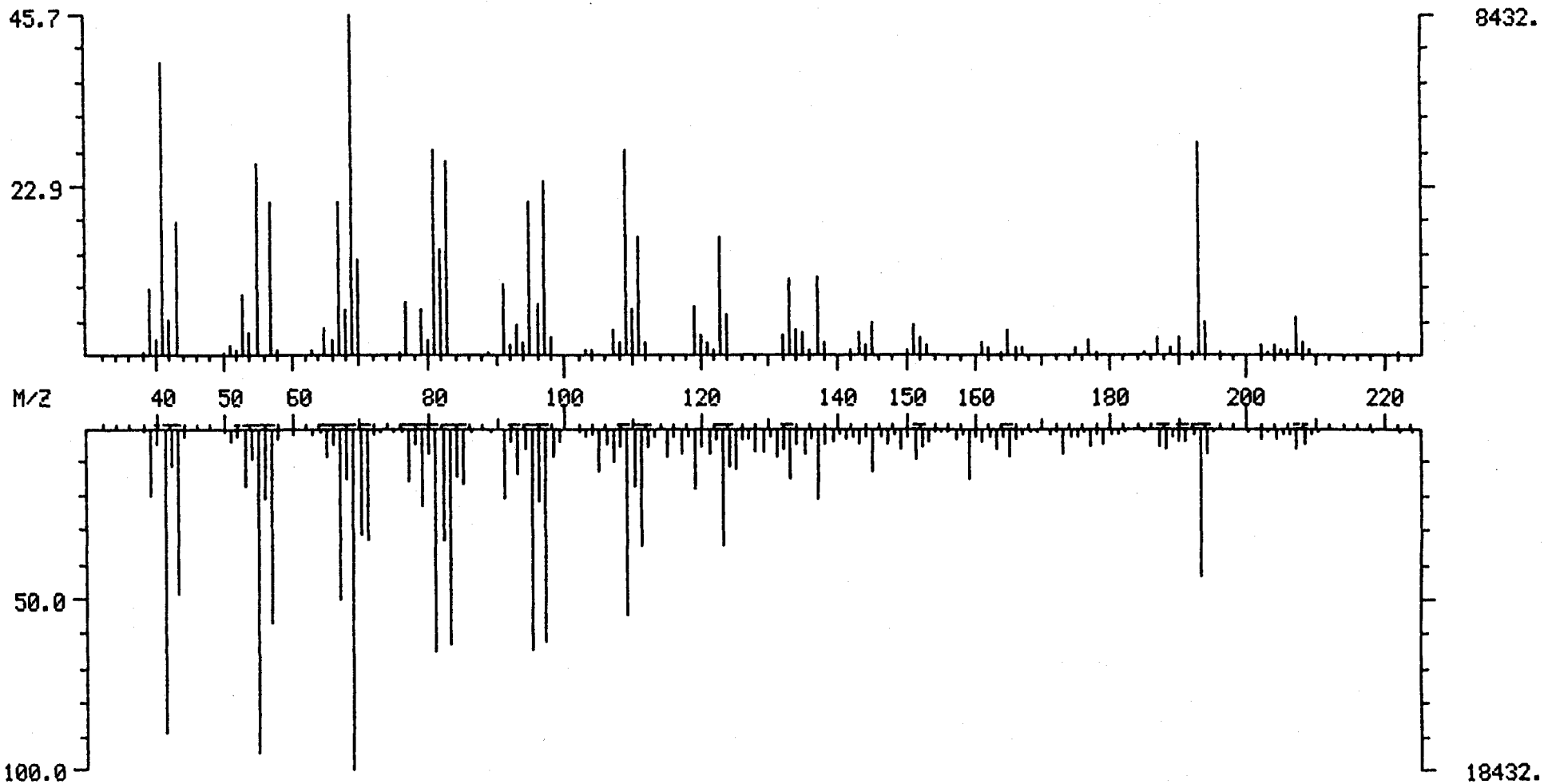
BASE M/Z: 69
RIC: 48320.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 18:11
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 181 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #917
CALI: 4AT13656 #3

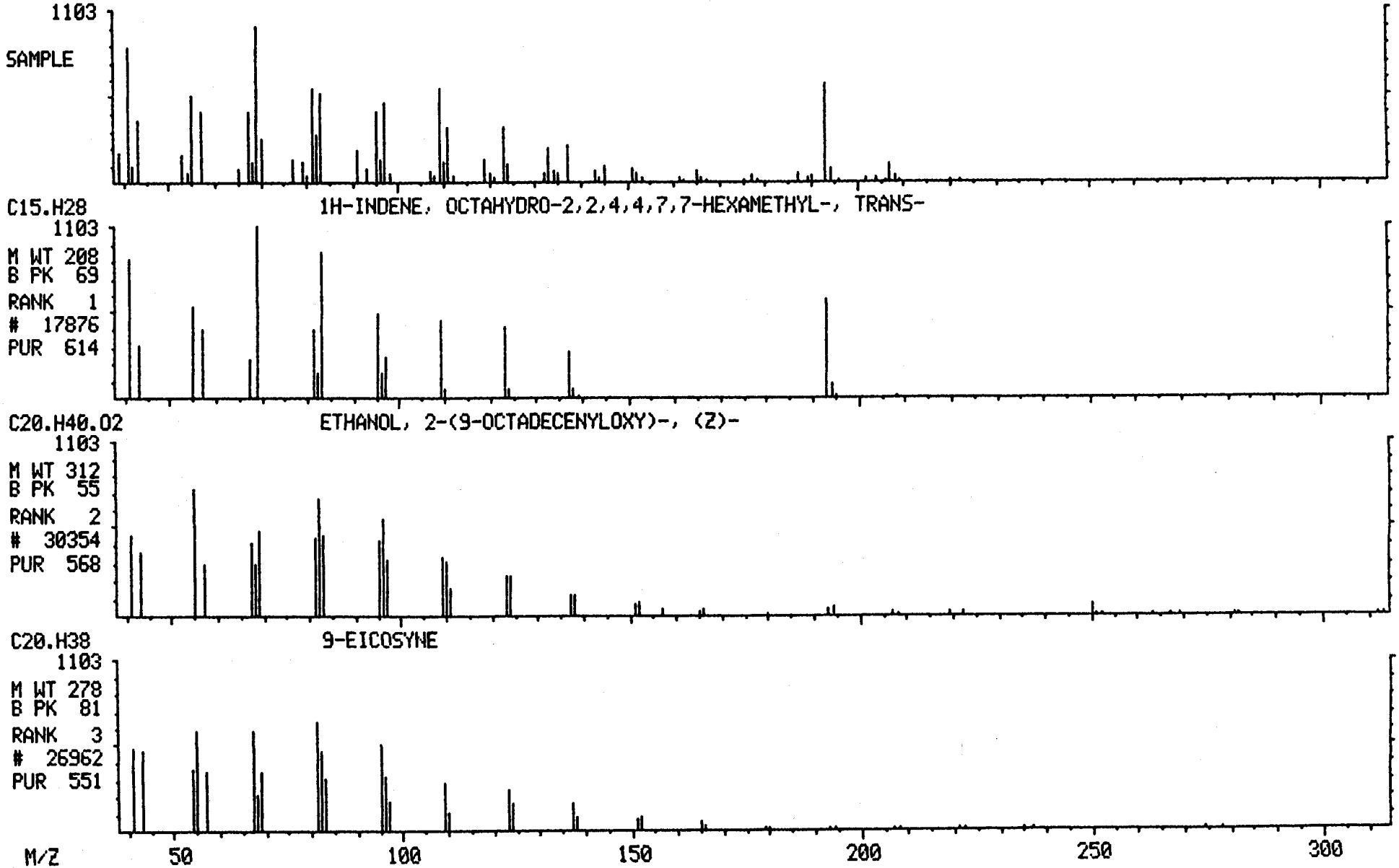
BASE M/Z: 69/ 69
RIC: 108160./ 307712.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 18:11
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 # 917
CALI: 4AT13656 # 3

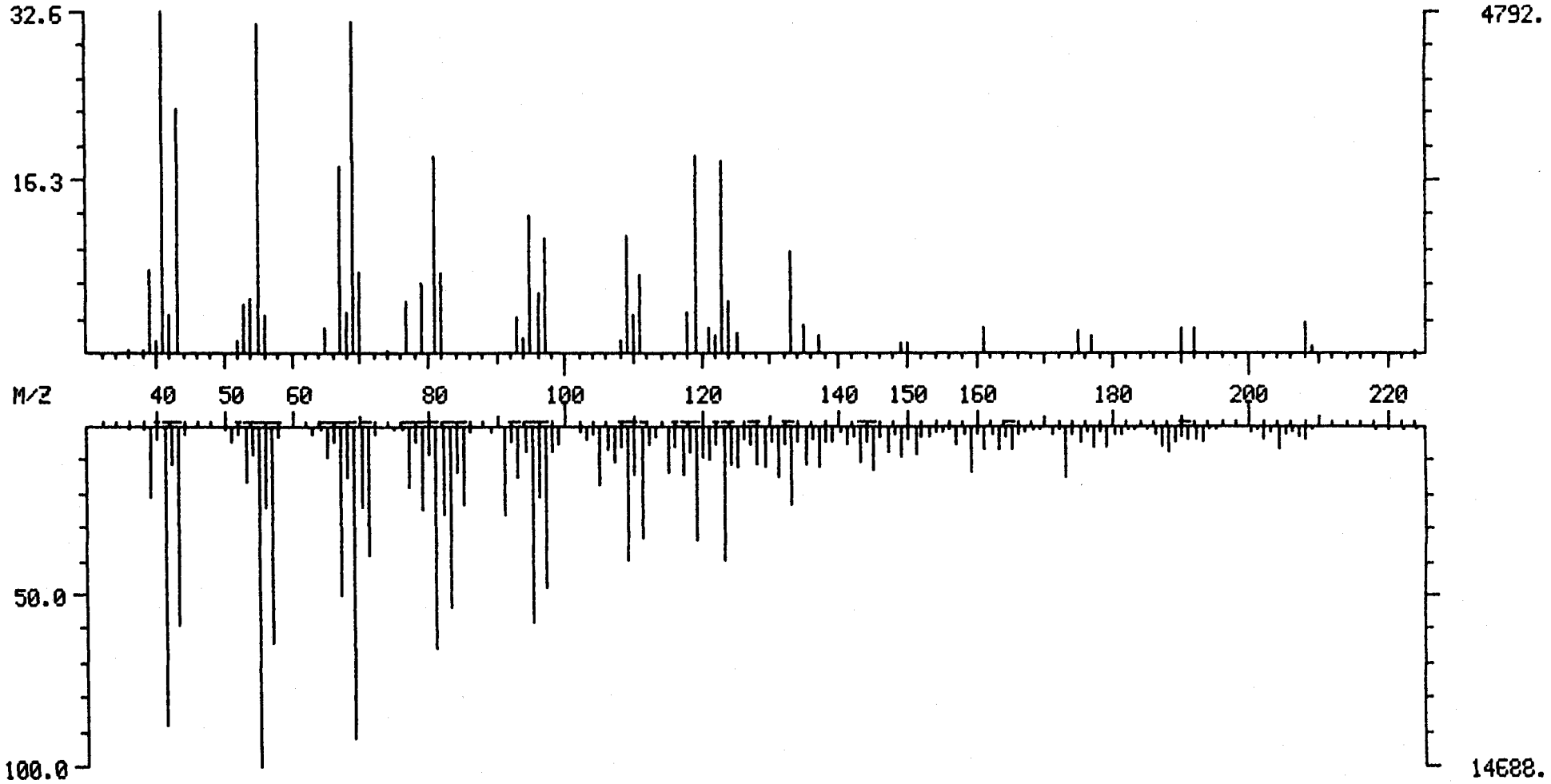
BASE M/Z:
RIC: 104704.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 18:32
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 184 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #934
CALI: 4AT13656 #3

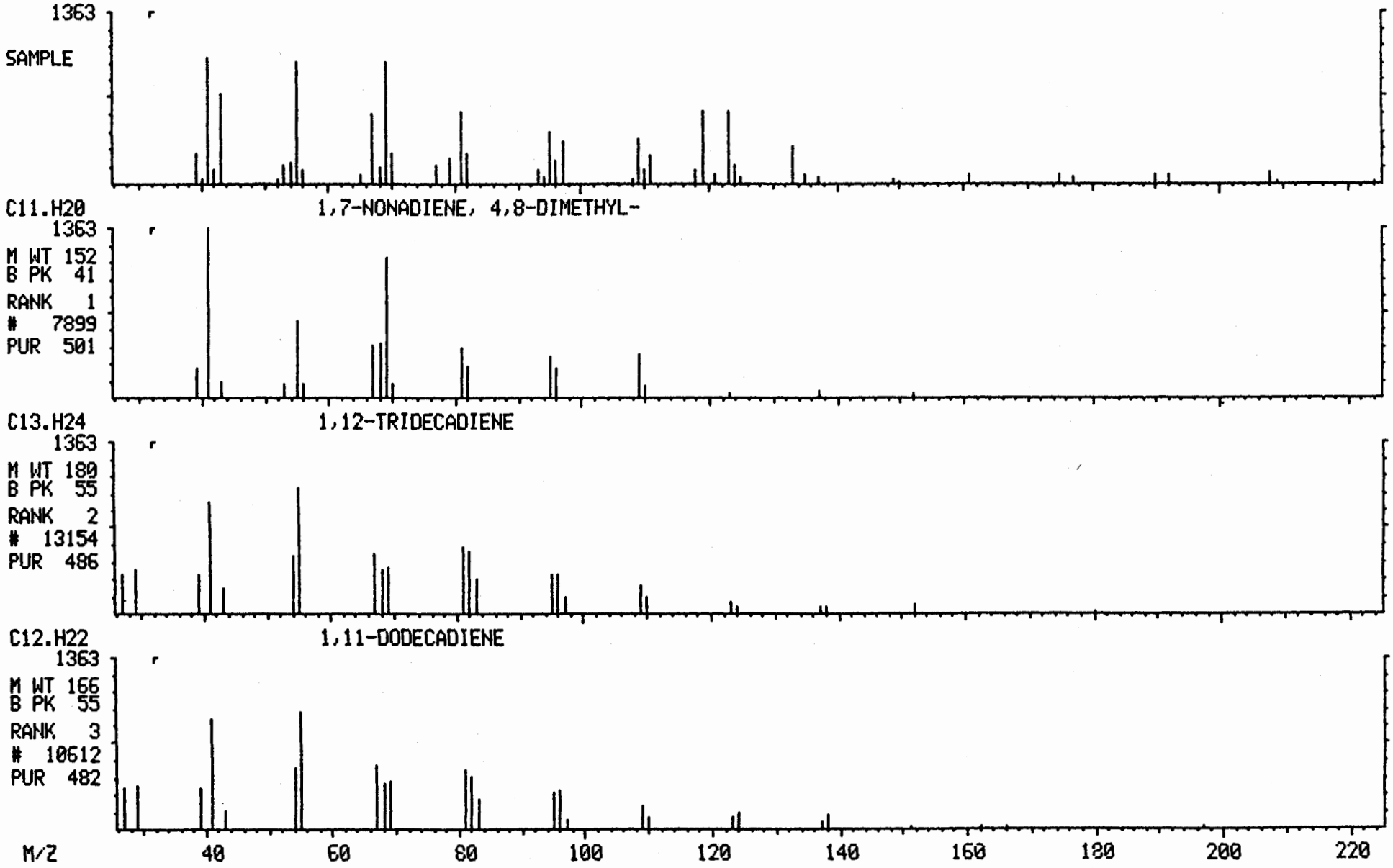
BASE M/Z: 41 55
RIC: 52480./ 256256.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 18:32
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

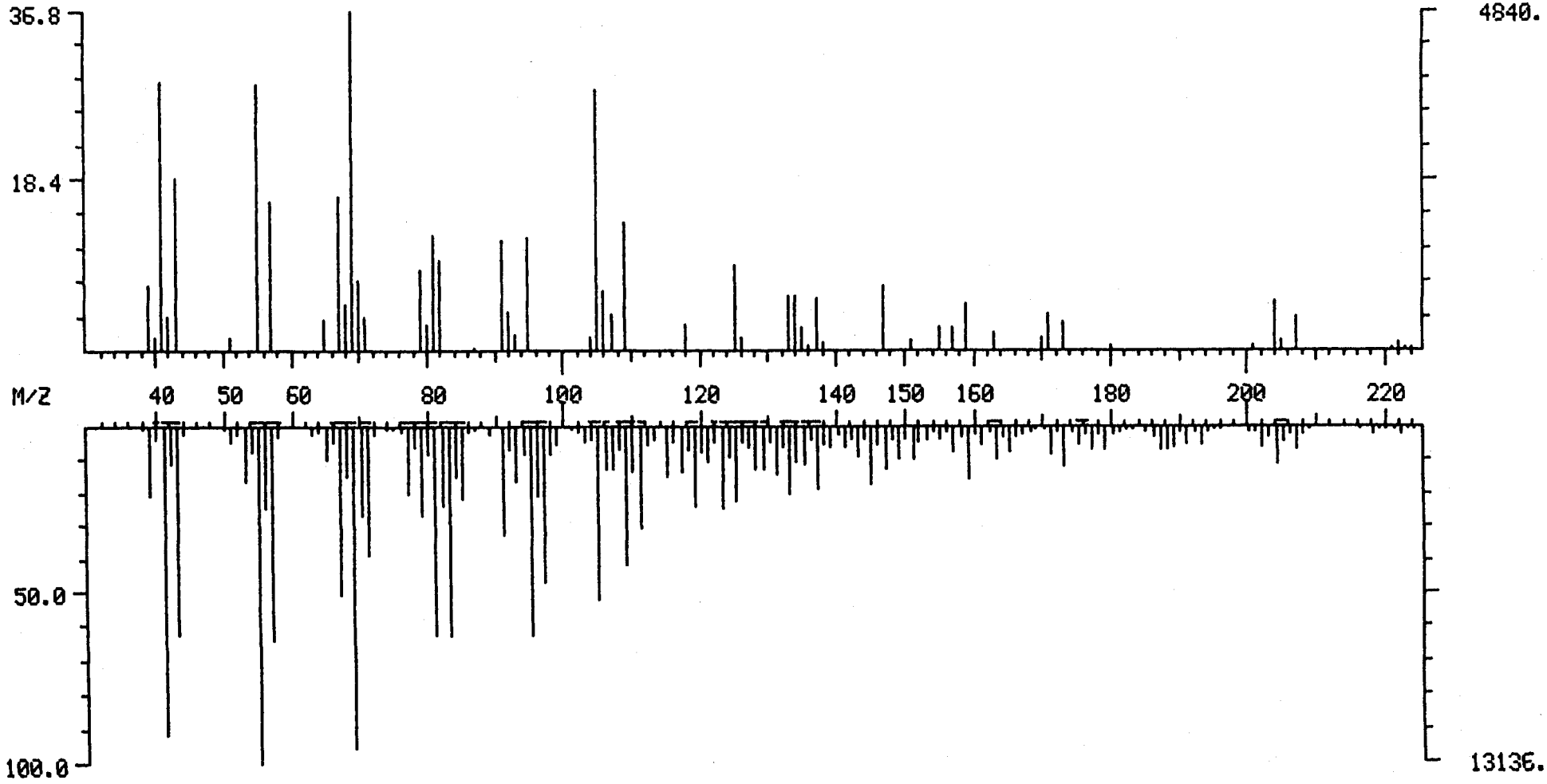
DATA: 4AT13656 # 934
CALI: 4AT13656 # 3

BASE M/Z:
RIC: 52160.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 18:43
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 186 DEG. C
ENHANCED (S 15B 2N 0T)

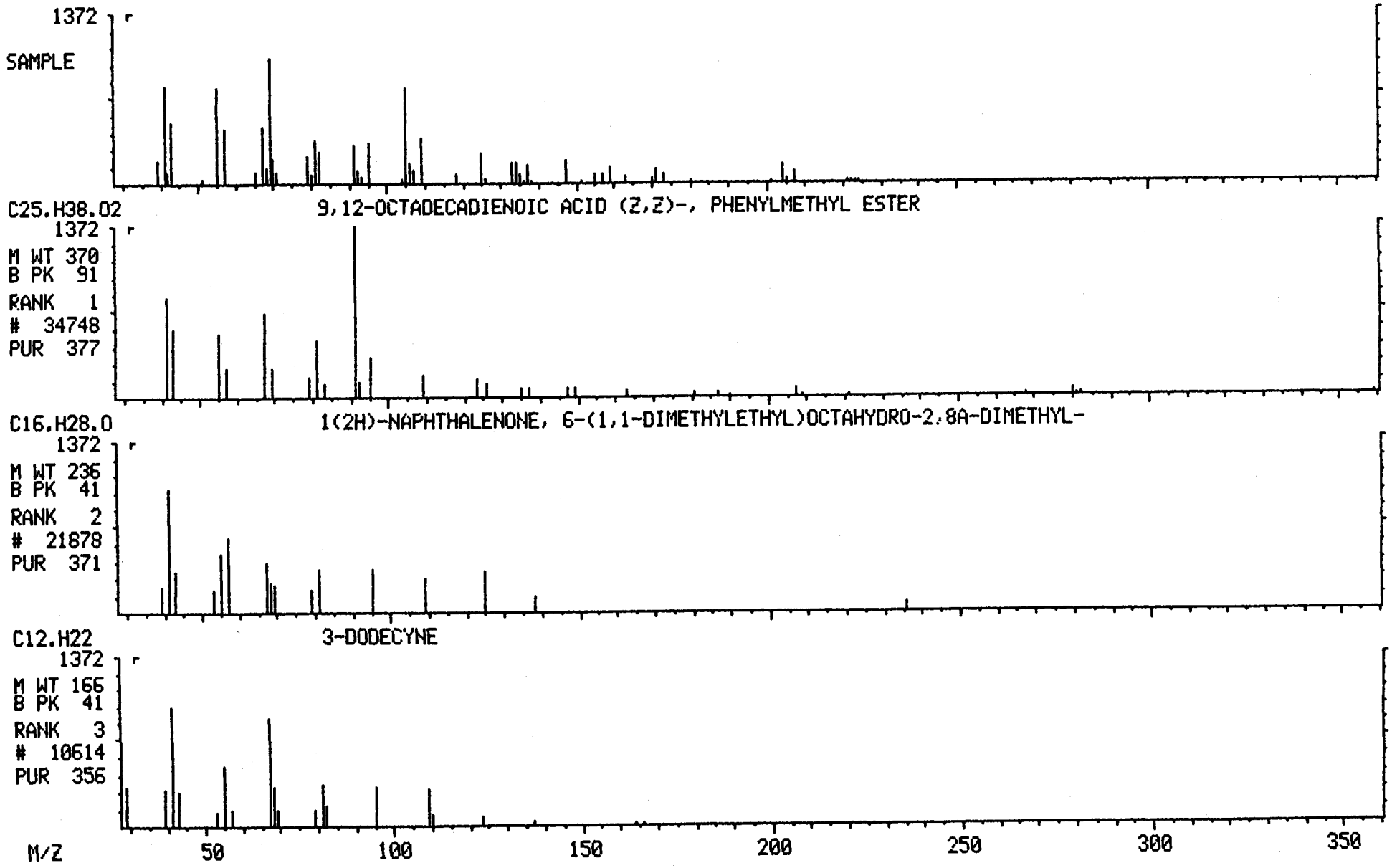
DATA: 4AT13656 #944 BASE M/Z: 6[illegible] 55
CALI: 4AT13656 #3 RIC: 48576./ 250624.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 18:43
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 # 944
CALI: 4AT13656 # 3

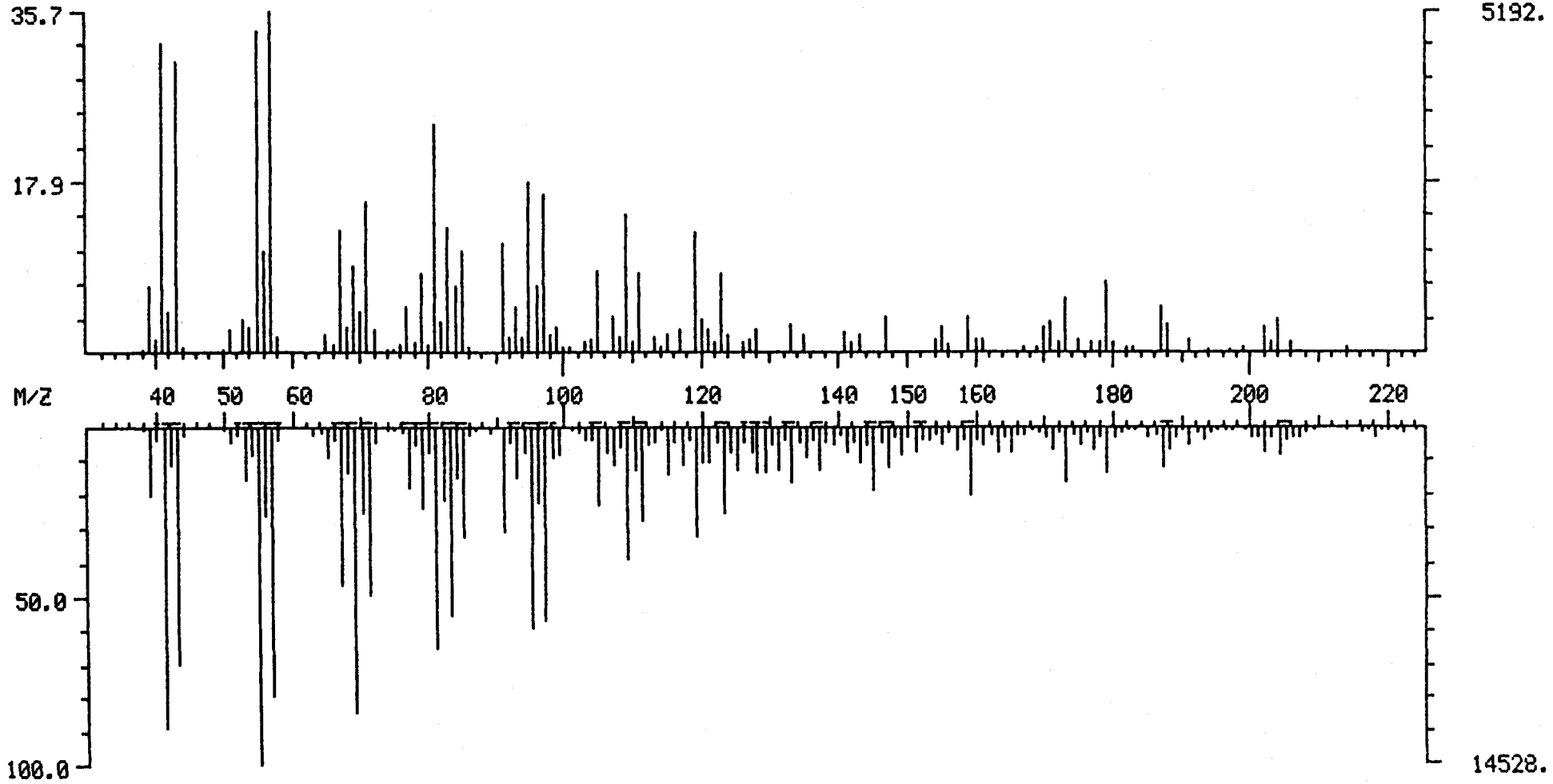
BASE M/Z:
RIC: 48384.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 19:05
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 189 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #962
CALI: 4AT13656 #3

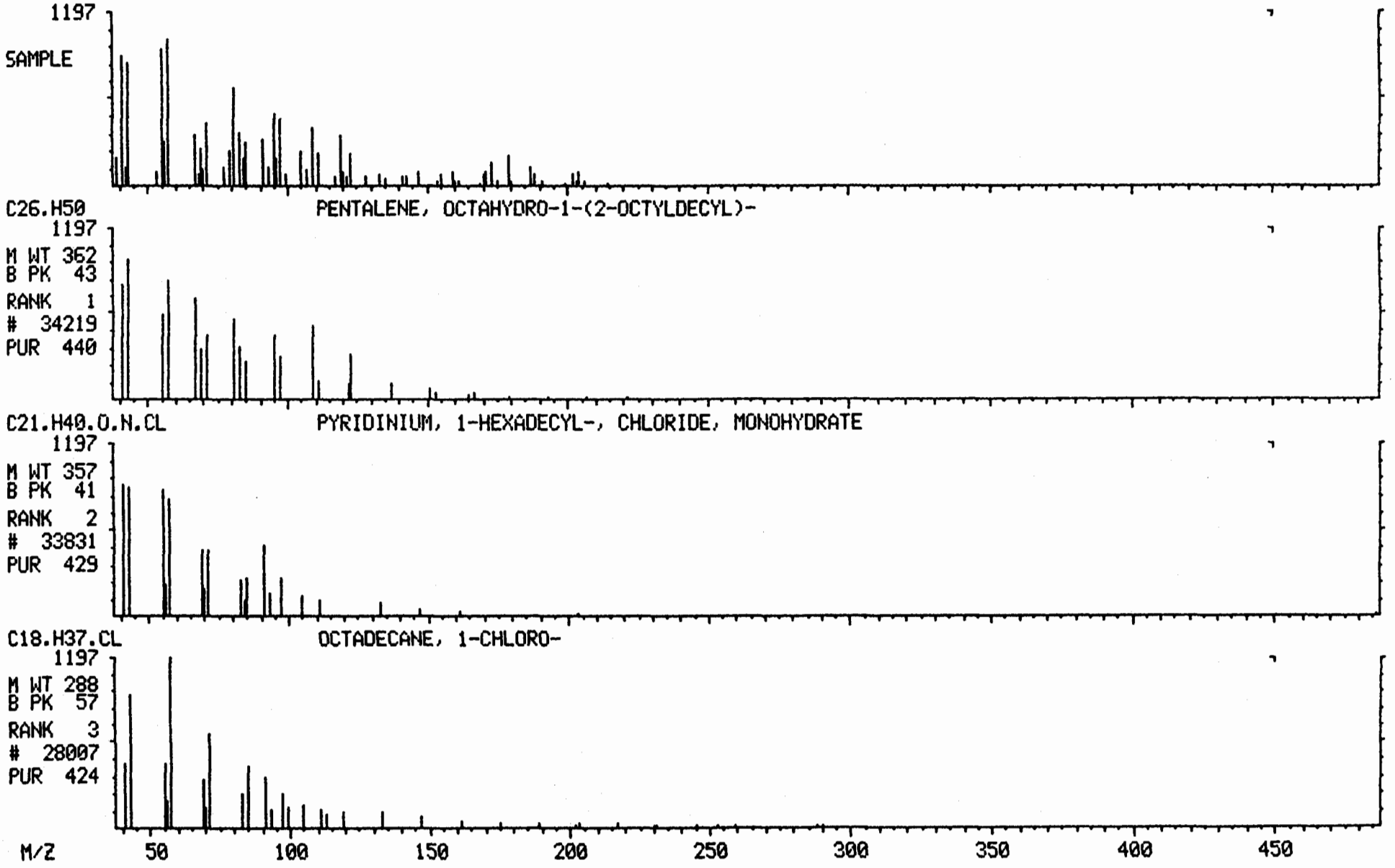
BASE M/Z: 57 65
RIC: 73728./ 269312.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 19:05
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 # 962
CALI: 4AT13656 # 3

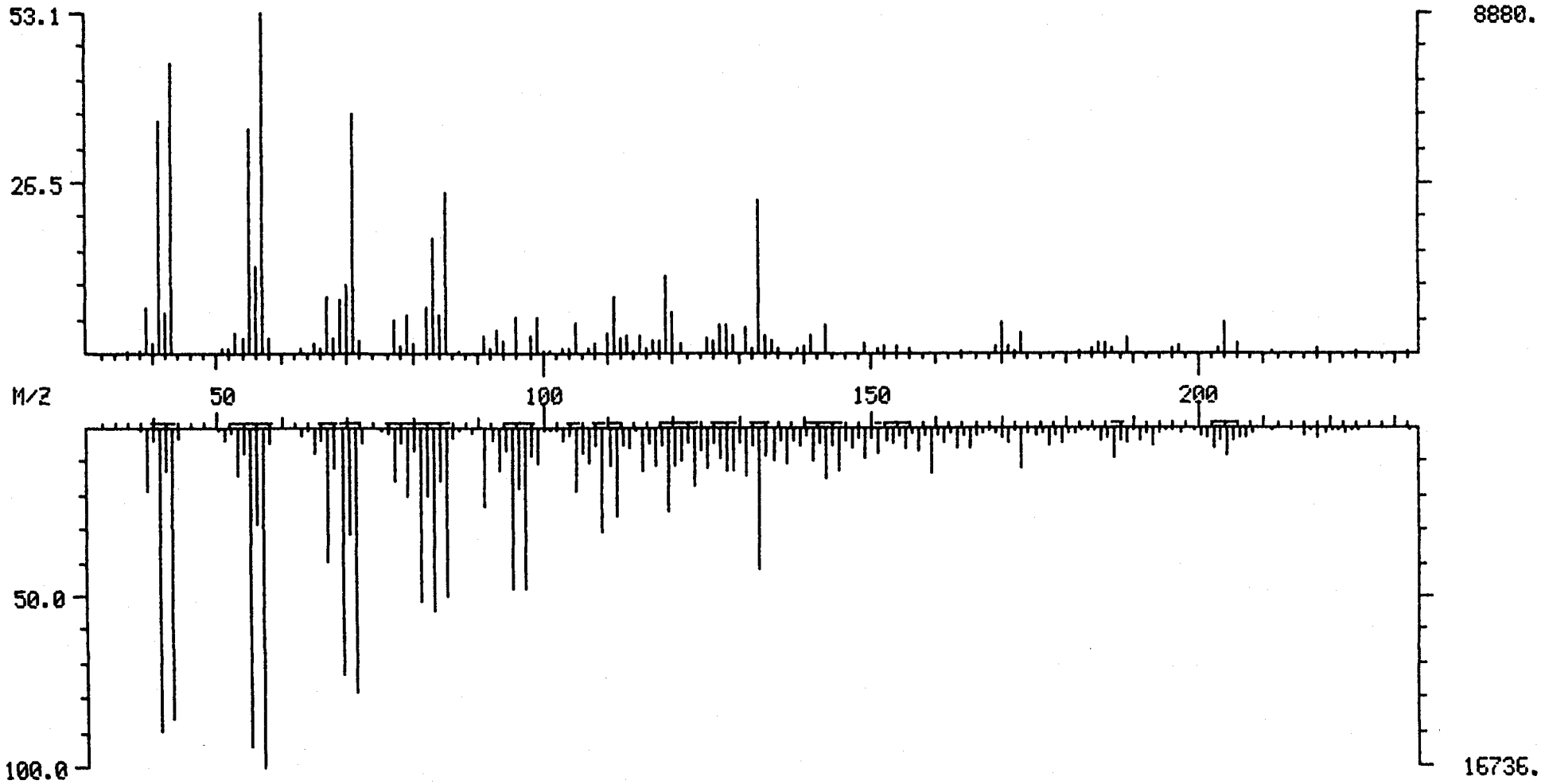
BASE M/Z:
RIC: 66688.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 19:16
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 191 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #971
CALI: 4AT13656 #3

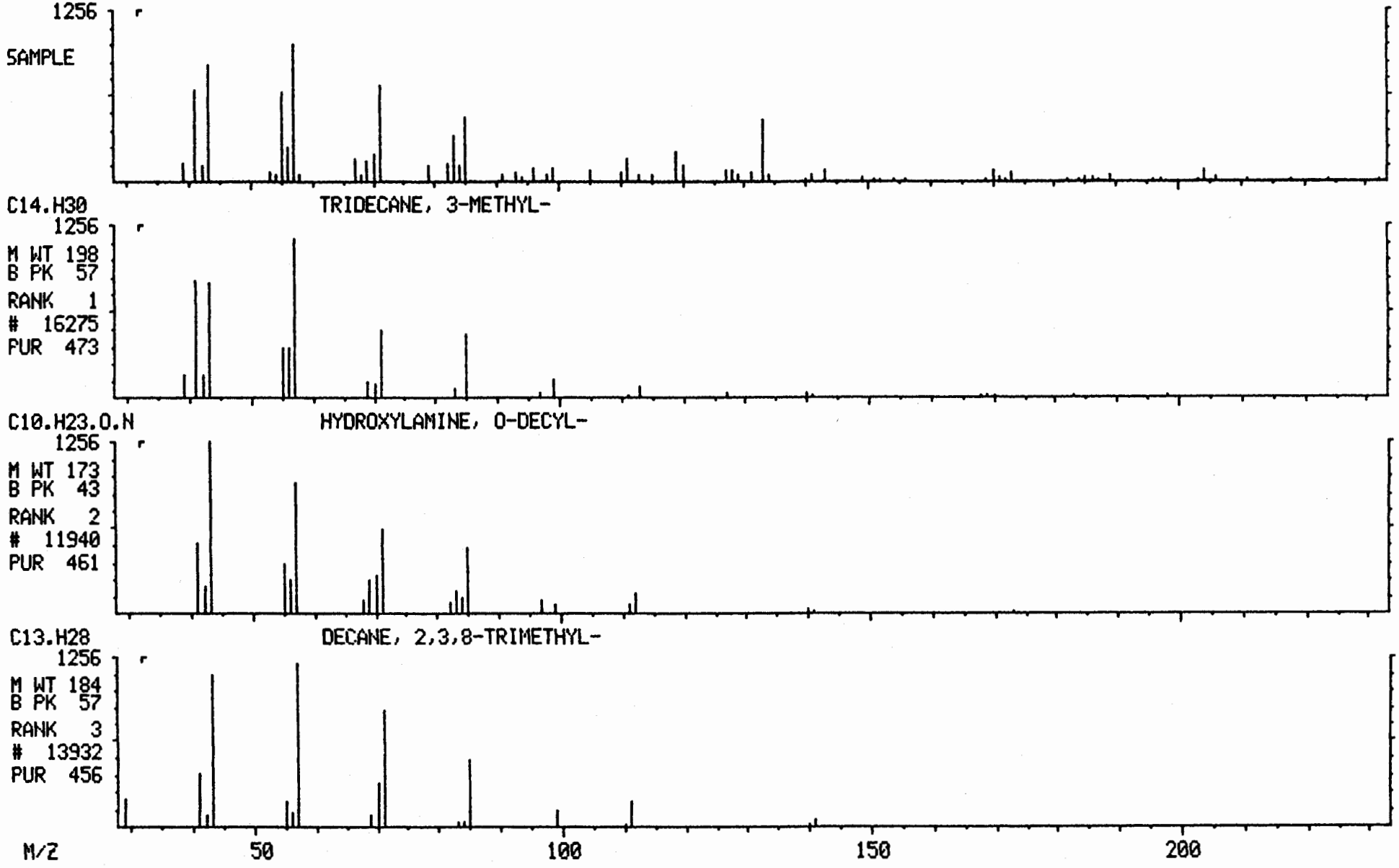
BASE M/Z: 57 57
RIC: 87168./ 301568.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 19:16
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 # 971
CALI: 4AT13656 # 3

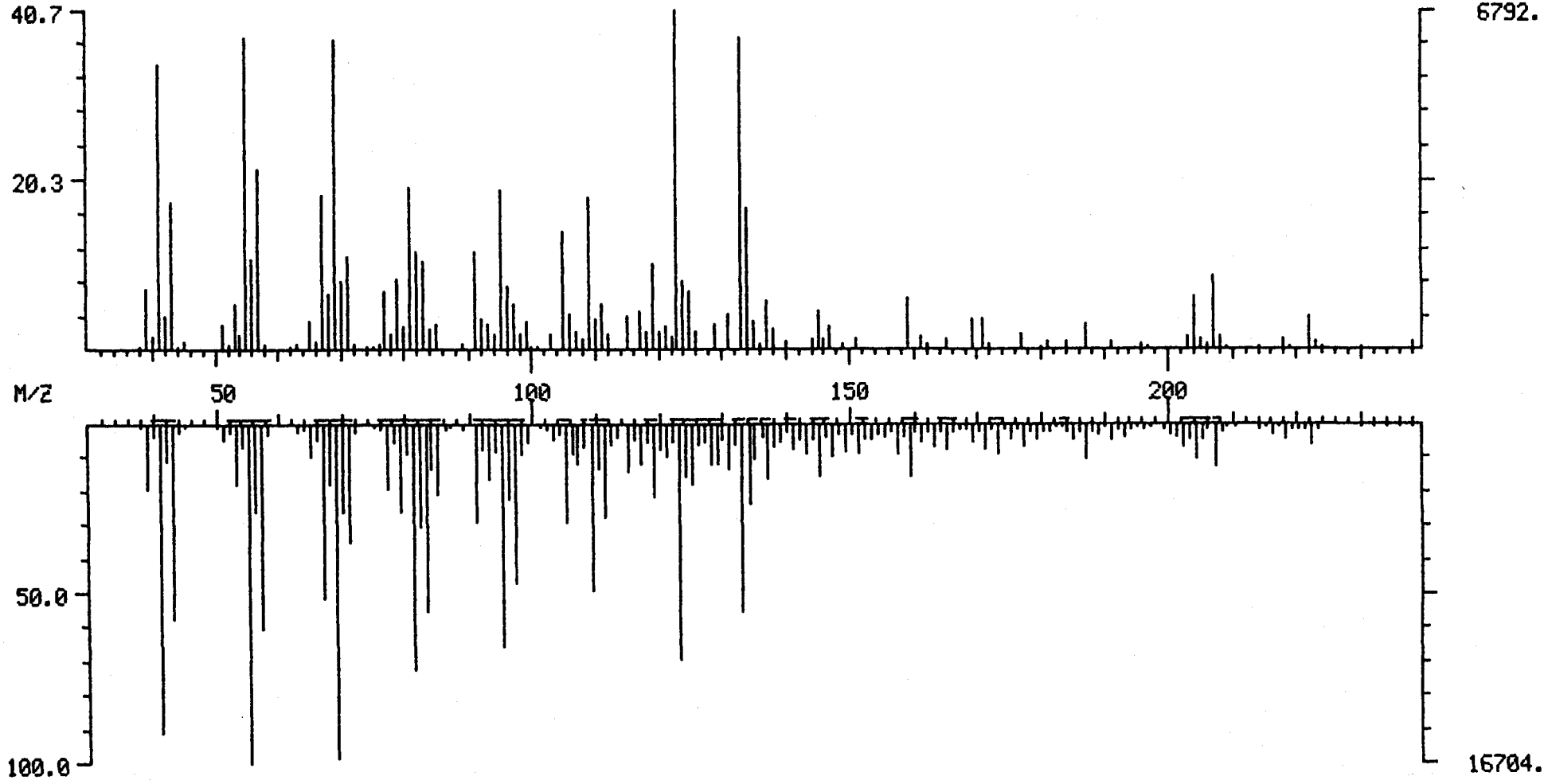
BASE M/Z:
RIC: 80512.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 19:30
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 194 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #983
CALI: 4AT13656 #3

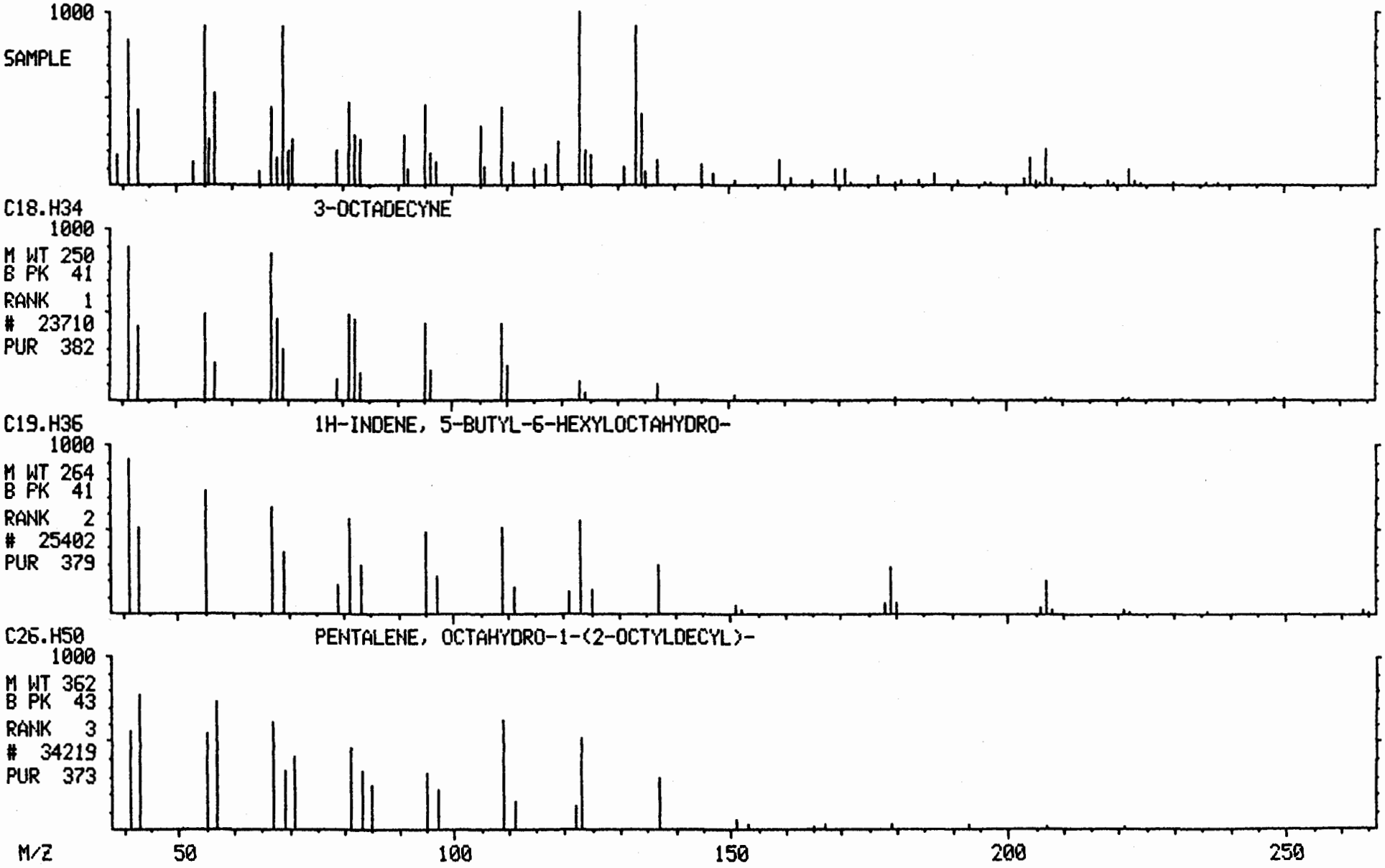
BASE M/Z: 123 55
RIC: 107520./ 329216.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 19:30
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 # 983
CALI: 4AT13656 # 3

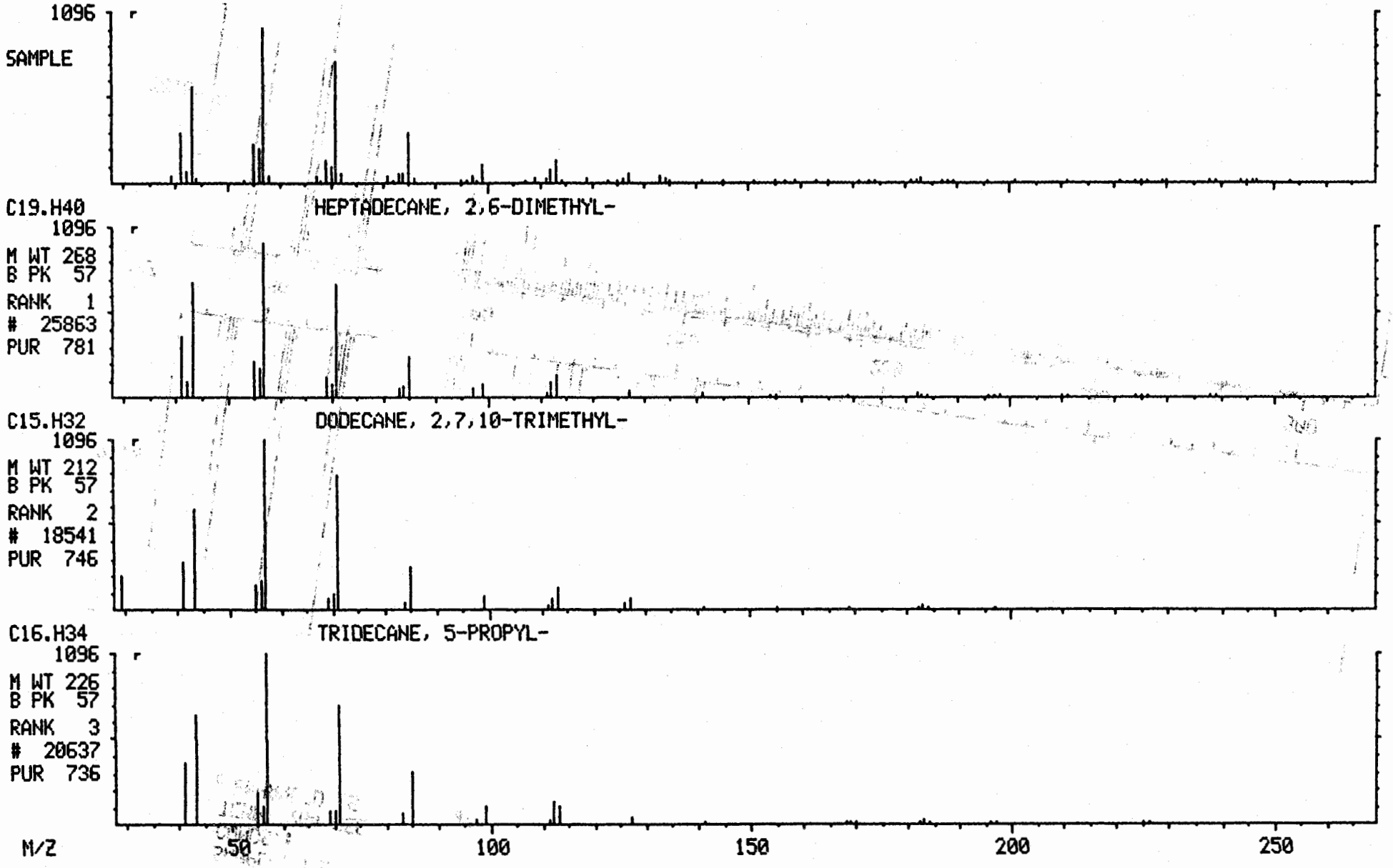
BASE M/Z: 1
RIC: 94720.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 20:59
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

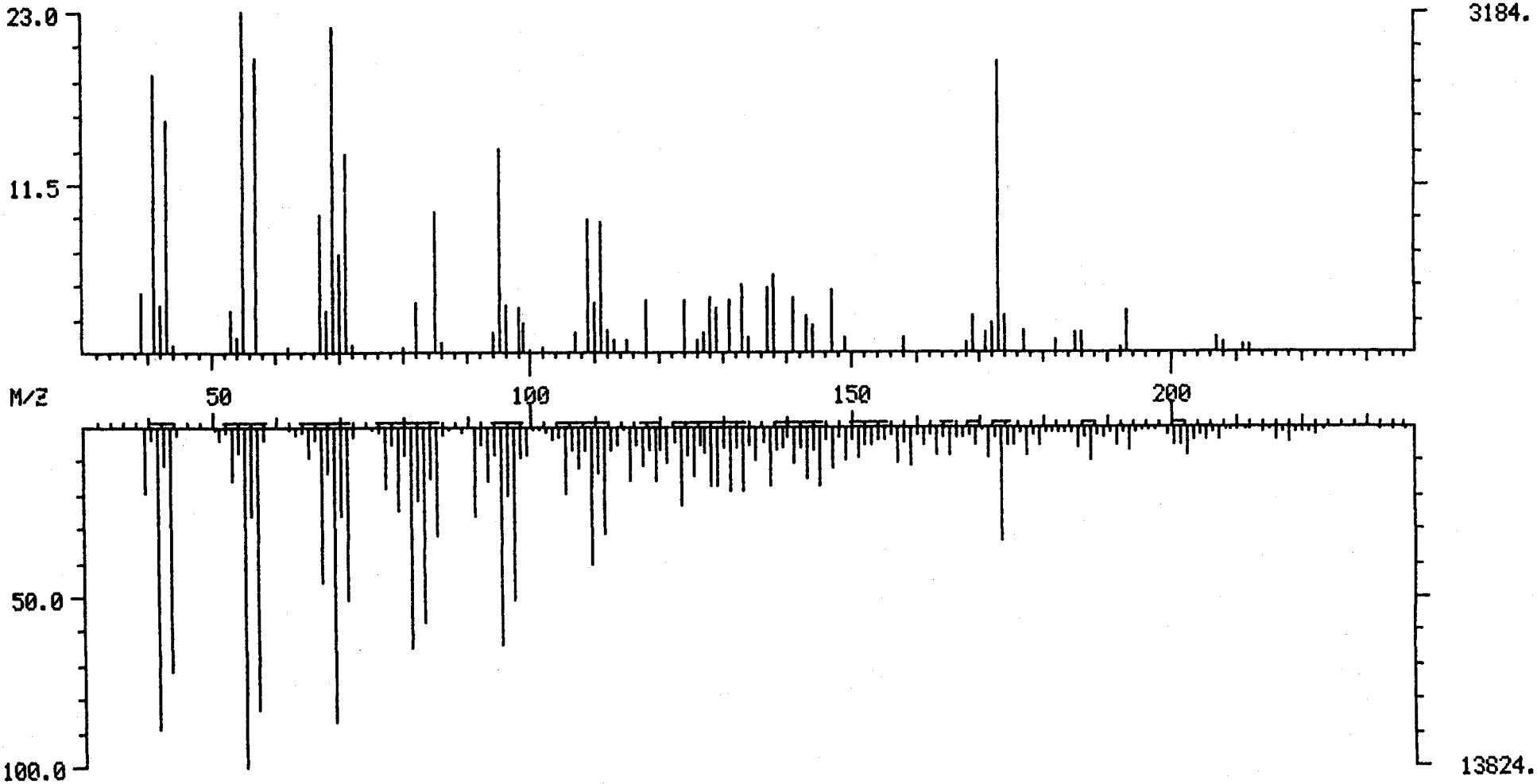
DATA: 4AT13656 #1058
CALI: 4AT13656 # 3

BASE M/Z:
RIC: 314368.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 19:36
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 195 DEG. C
ENHANCED (S 15B 2N 0T)

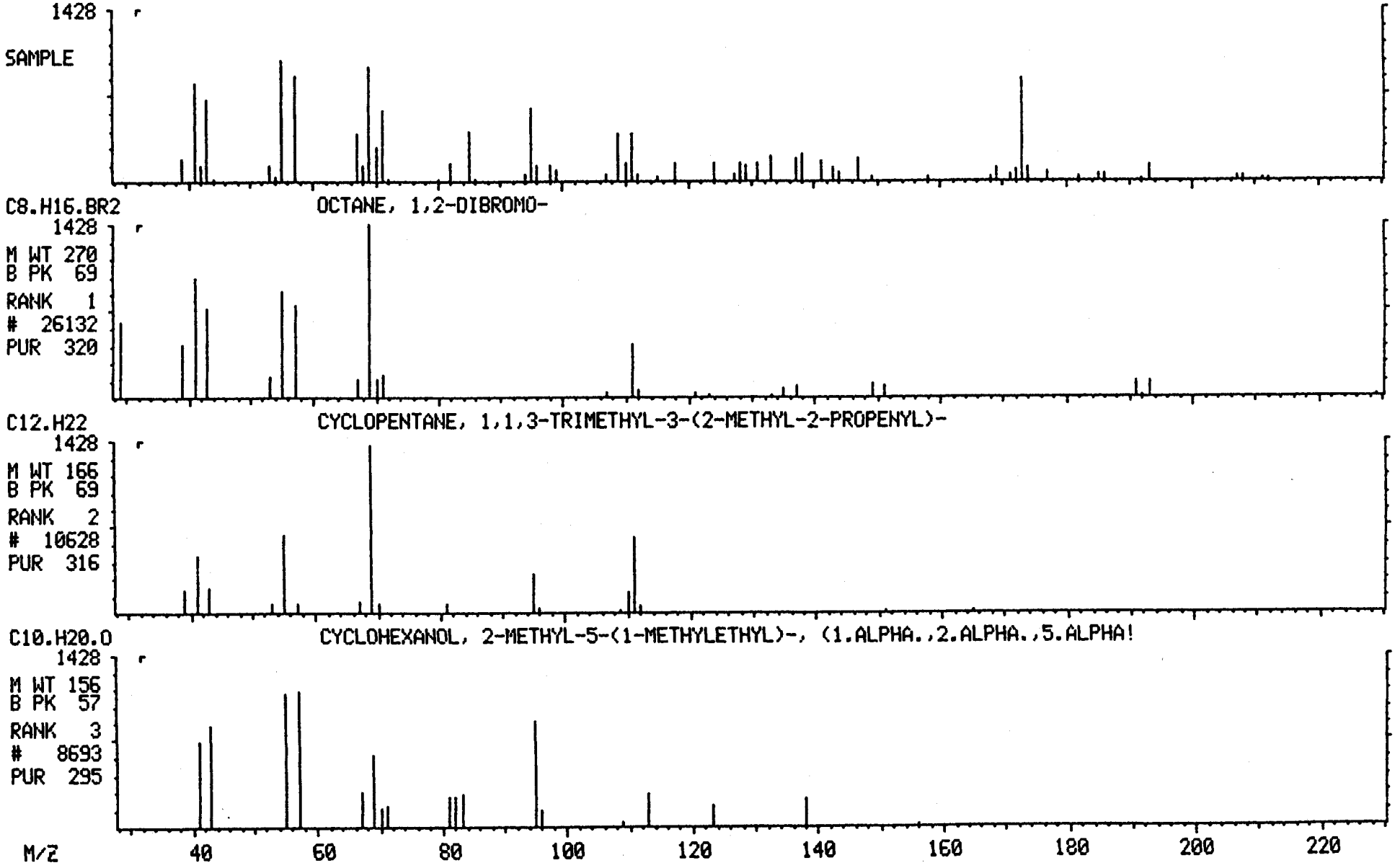
DATA: 4AT13656 #988 BASE M/Z: 55
CALI: 4AT13656 #3 RIC: 41600./ 266752.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 19:36
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 # 988
CALI: 4AT13656 # 3

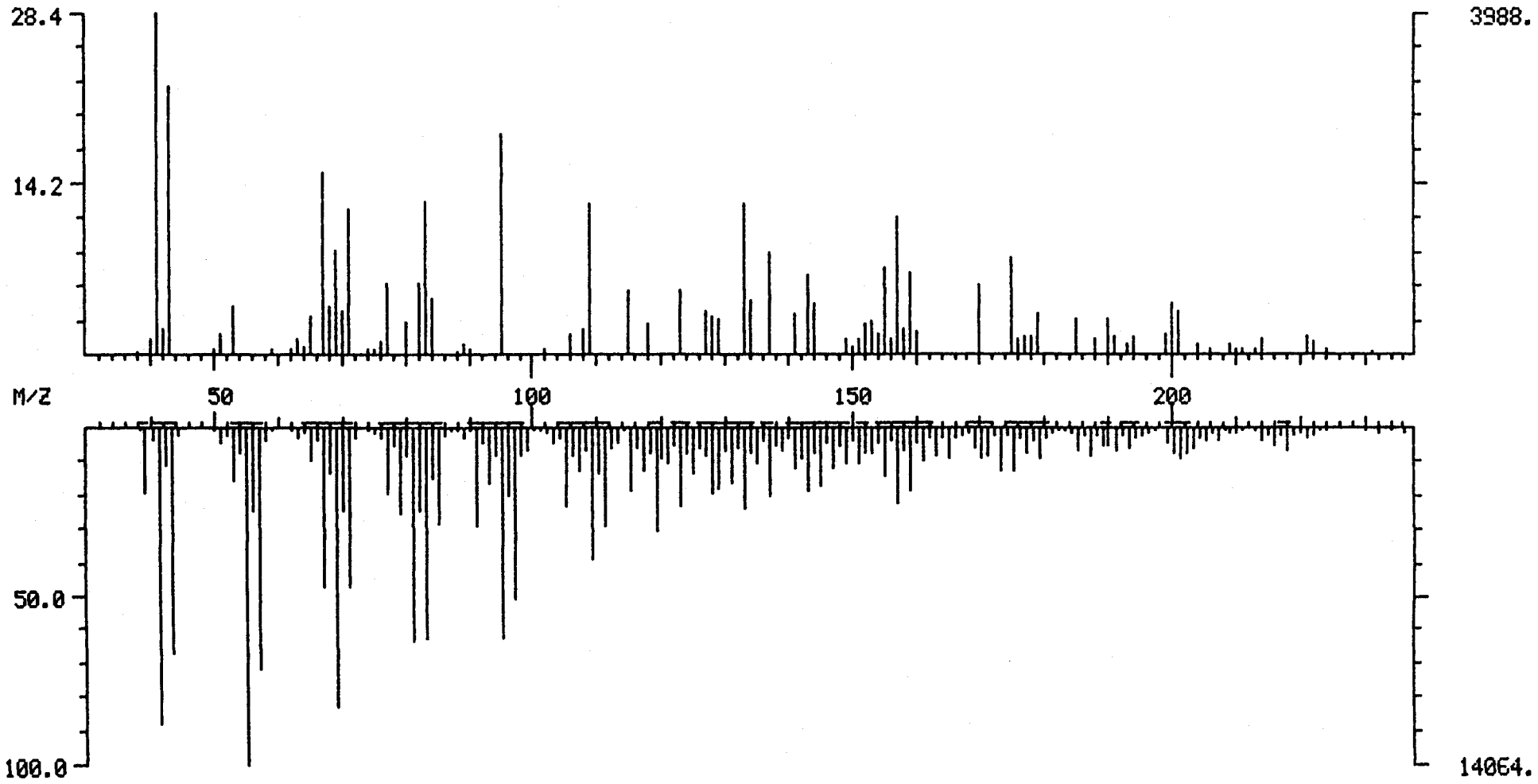
BASE M/Z:
RIC: 41024.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 19:45
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 196 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #996
CALI: 4AT13656 #3

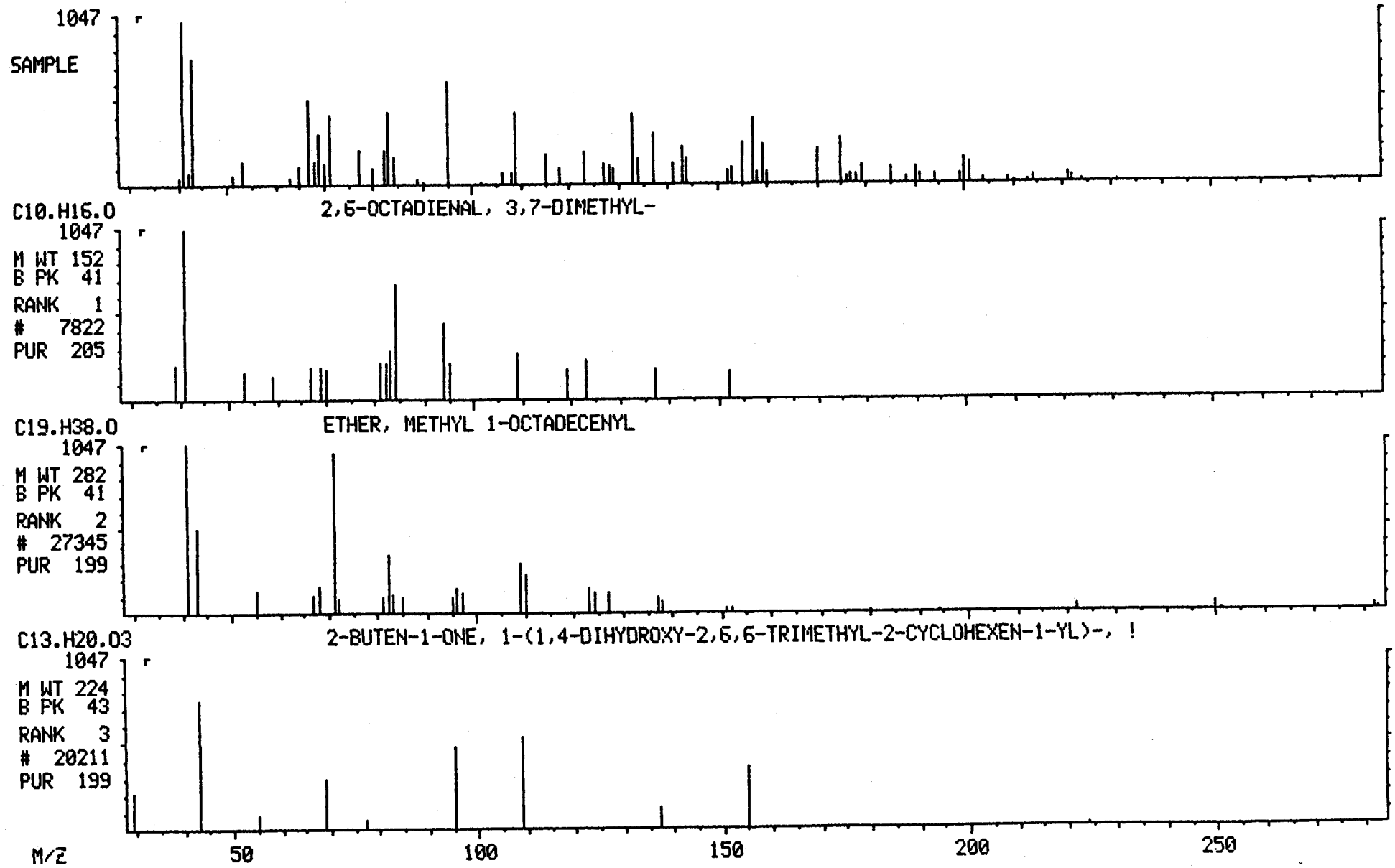
BASE M/Z: 41. 55
RIC: 46976./ 287232.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 19:45
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

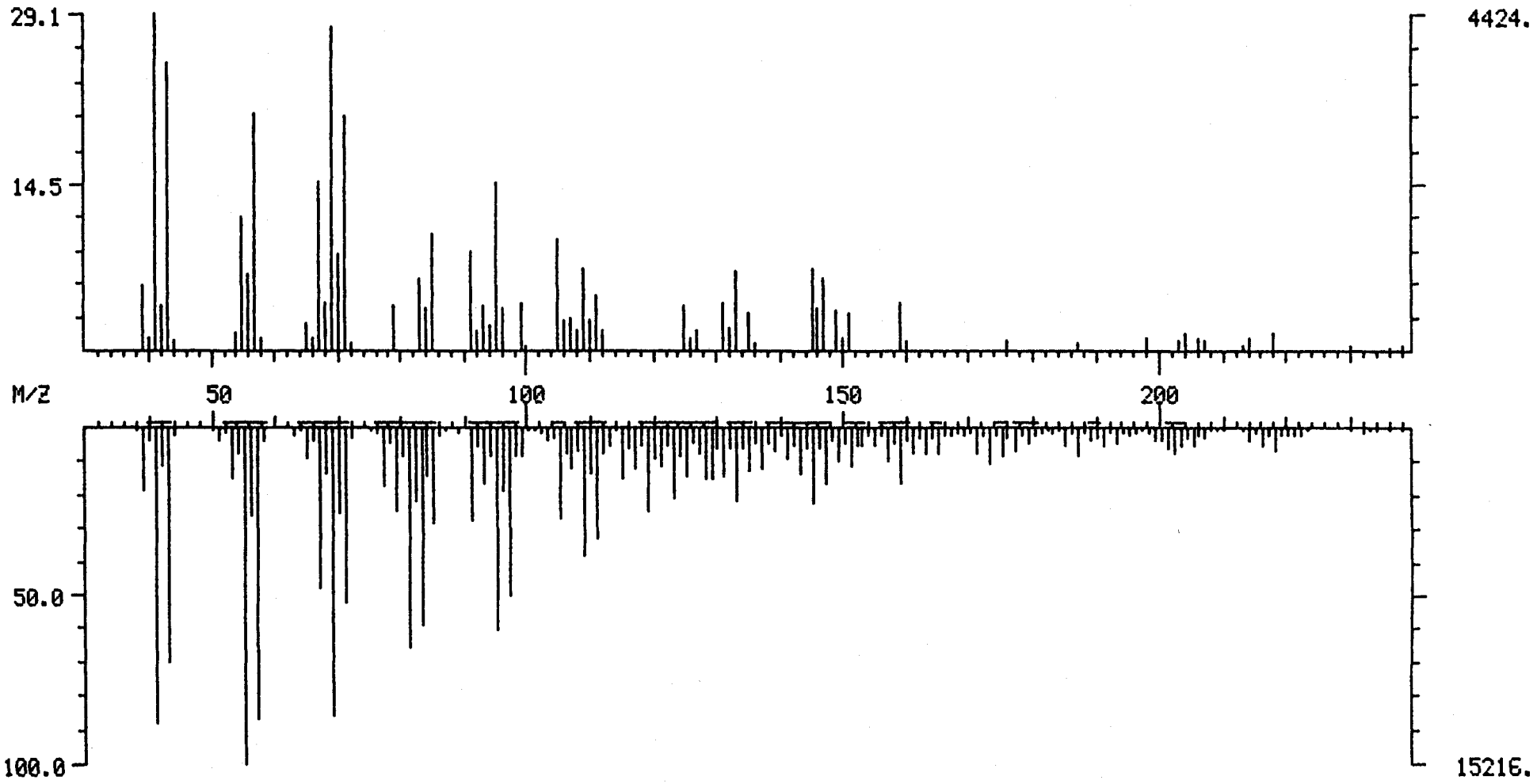
DATA: 4AT13656 # 996
CALI: 4AT13656 # 3

BASE M/Z:
RIC: 45184.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 19:50
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 197 DEG. C
ENHANCED (S 15B 2N 0T)

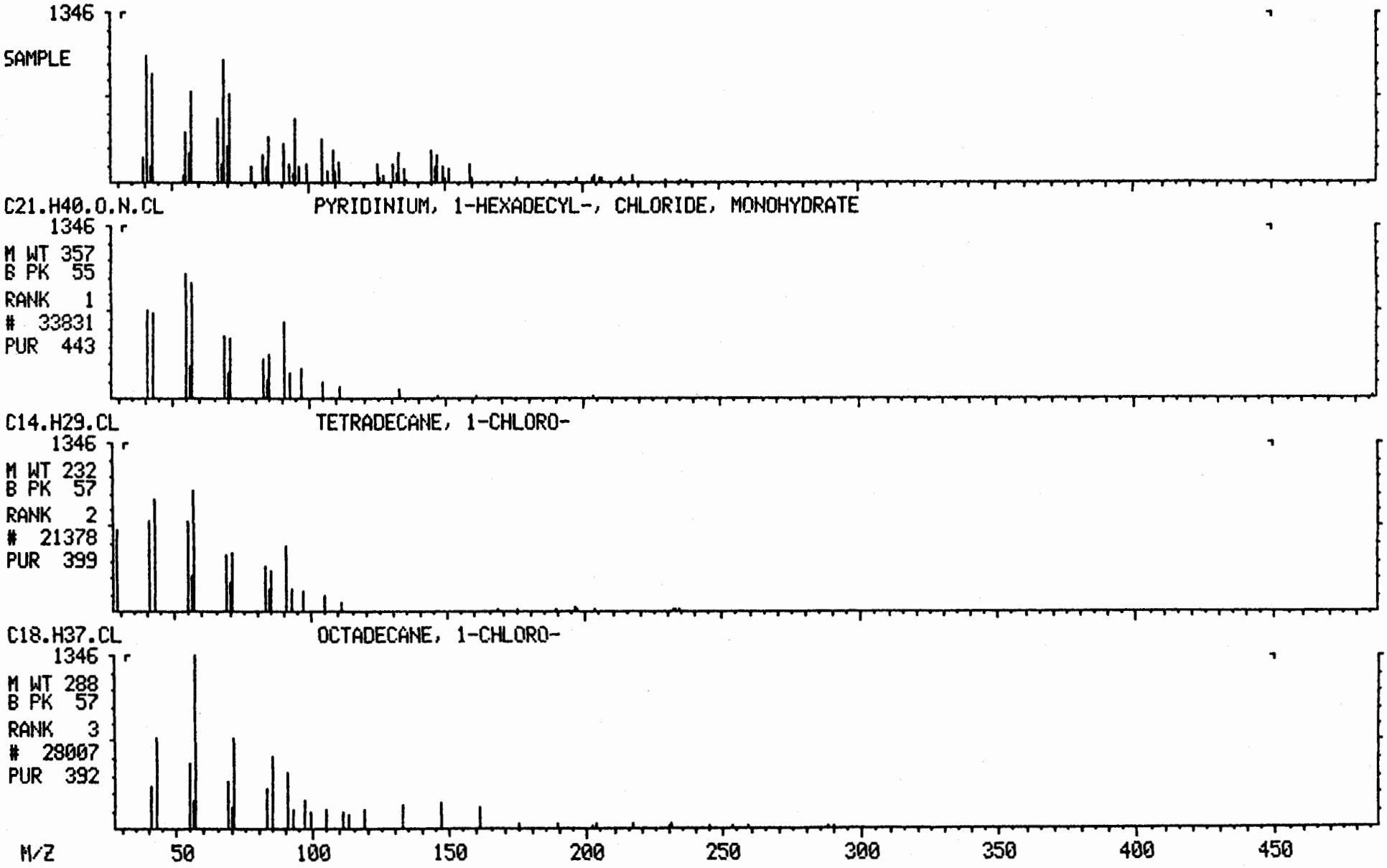
DATA: 4AT13656 #1000 BASE M/Z: 41 55
CALI: 4AT13656 #3 RIC: 52864./ 293888.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 19:50
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

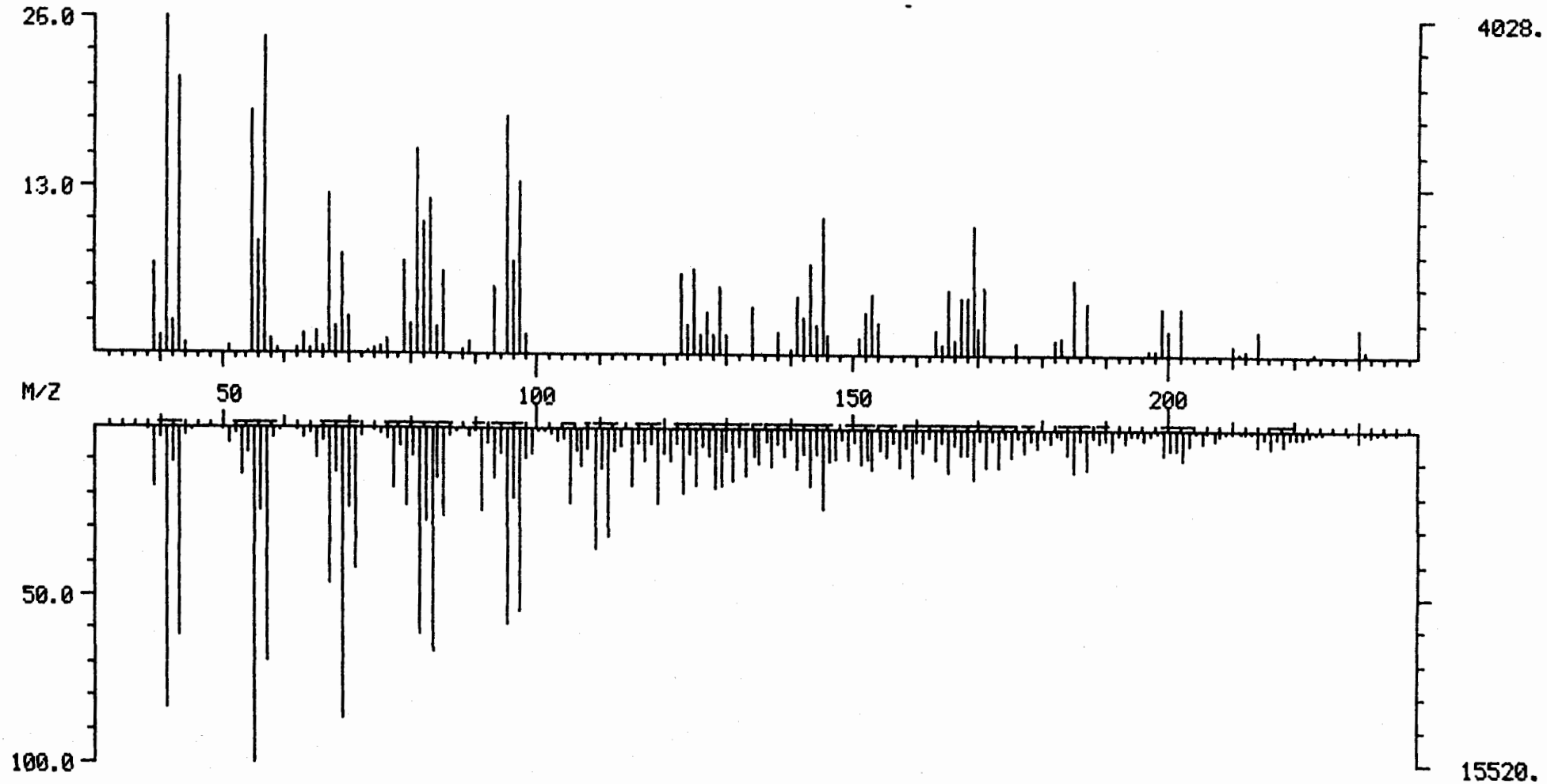
DATA: 4AT13656 #1000
CALI: 4AT13656 # 3

BASE M/Z: 41
RIC: 50624.



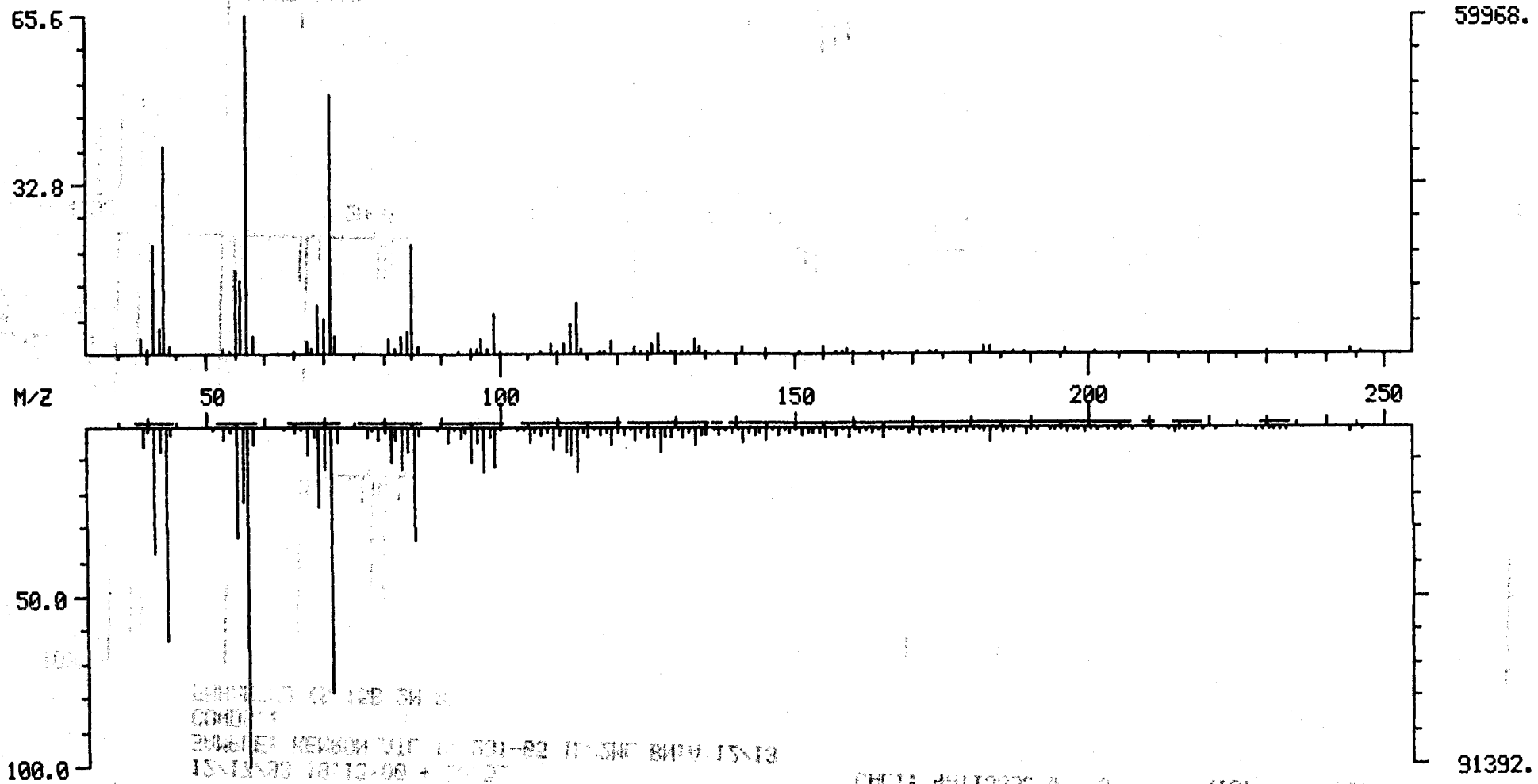
DUAL MASS SPECTRUM
12/17/93 18:15:00 + 20:00
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 199 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #1008 BASE M/Z: 41. 55
CALI: 4AT13656 #3 RIC: 60224./ 306688.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 20:59
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 209 DEG. C
ENHANCED (S 15B 2N 0T)

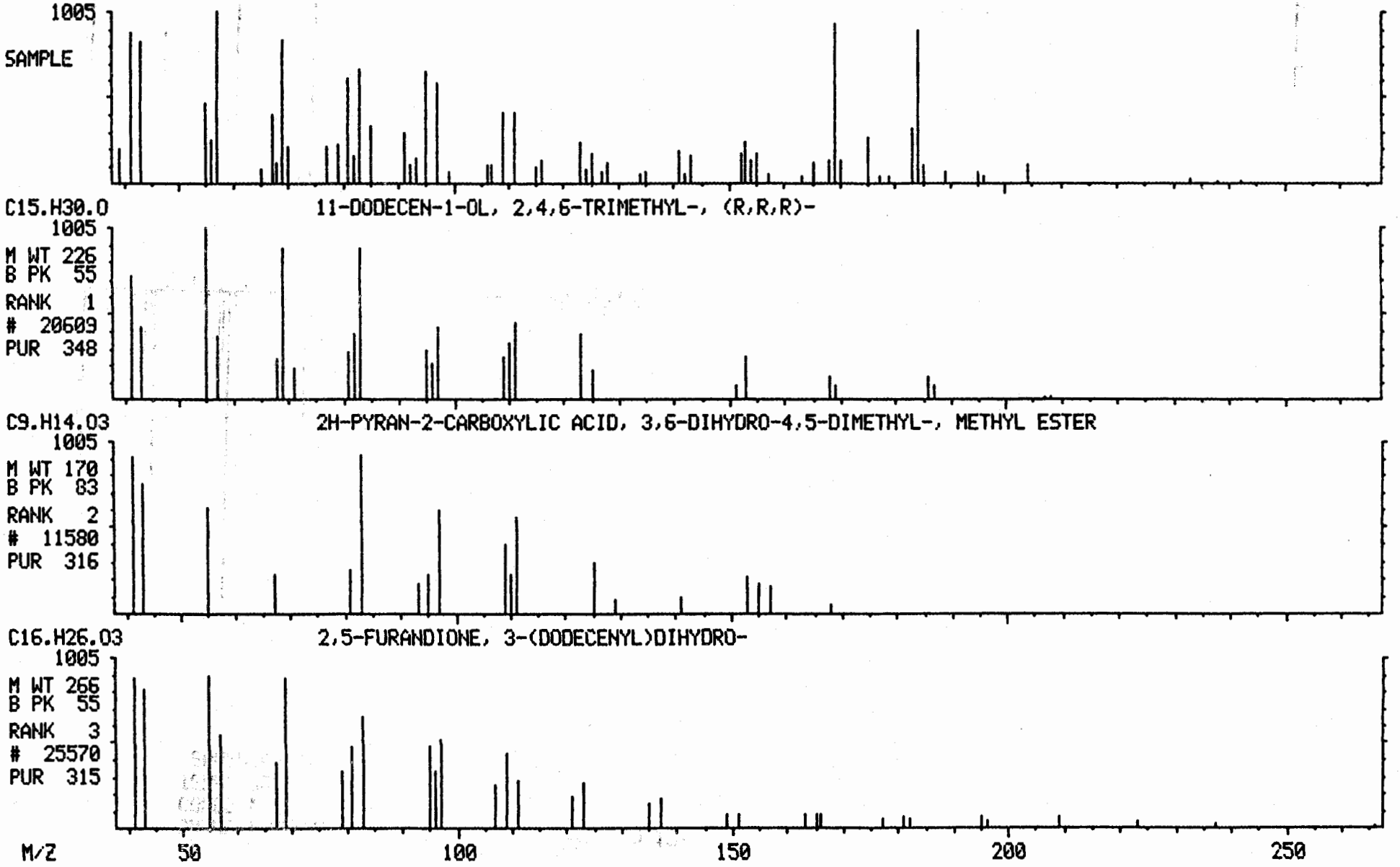
DATA: 4AT13656 #1058 BASE M/Z: 5[illegible] 57
CALI: 4AT13656 #3 RIC: 322560./ 704512.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 20:52
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

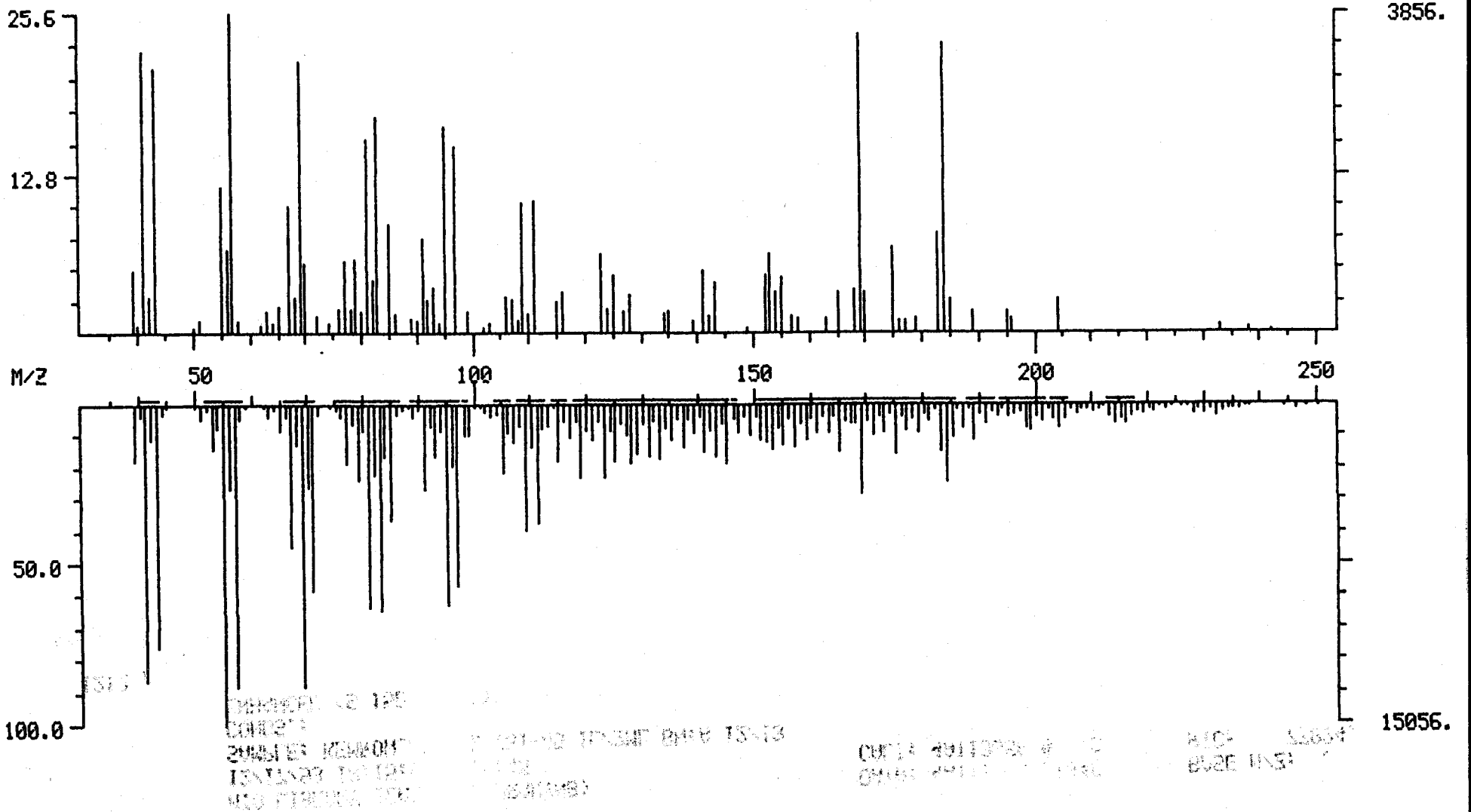
DATA: 4AT13656 #1052
CALI: 4AT13656 # 3

BASE M/Z:
RIC: 61888.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 20:52
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 207 DEG. C
ENHANCED (S 15B 2N 0T)

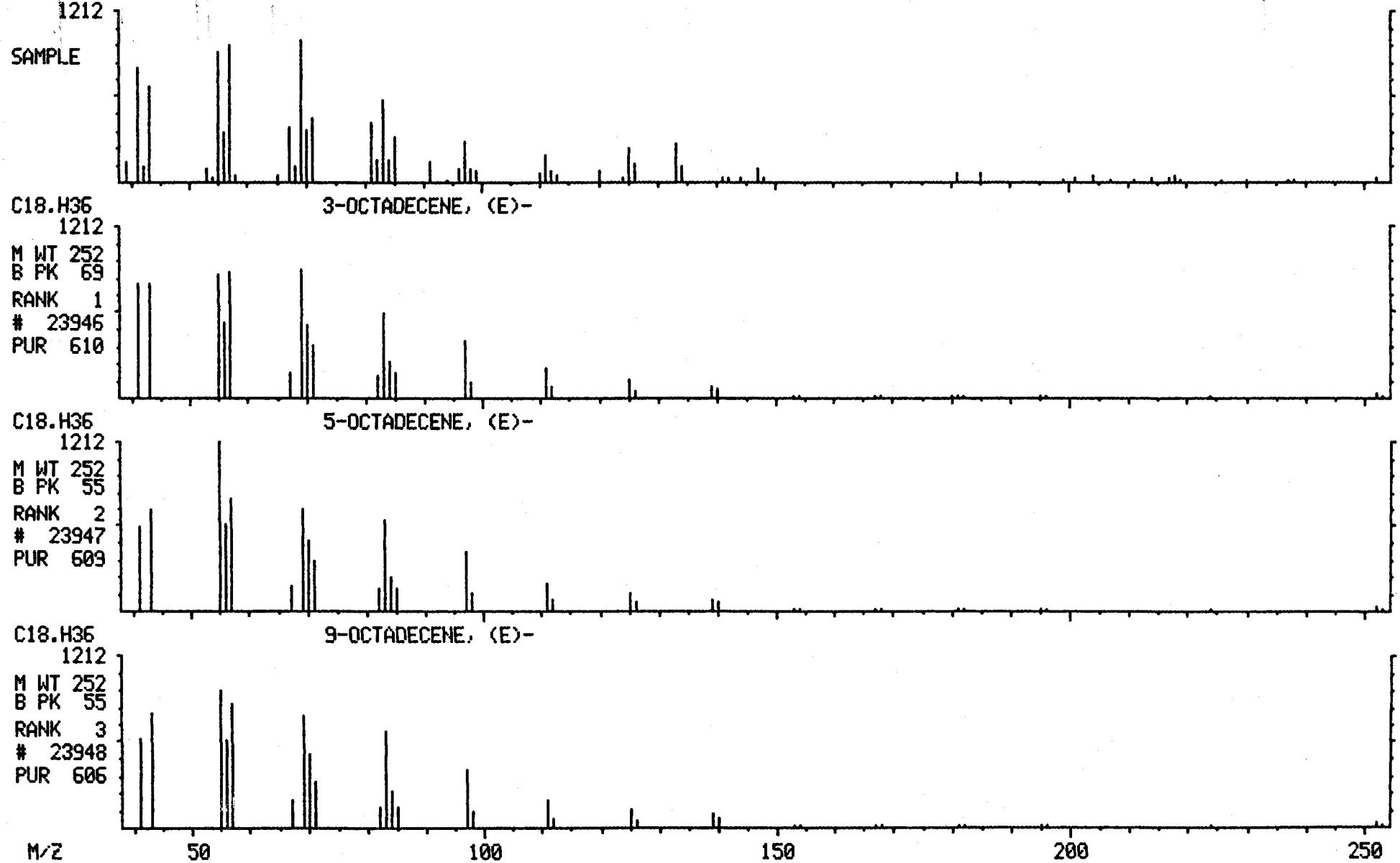
DATA: 4AT13656 #1052 BASE M/Z: 5[illegible] 55
CALI: 4AT13656 #3 RIC: 66176./ 330752.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 20:45
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

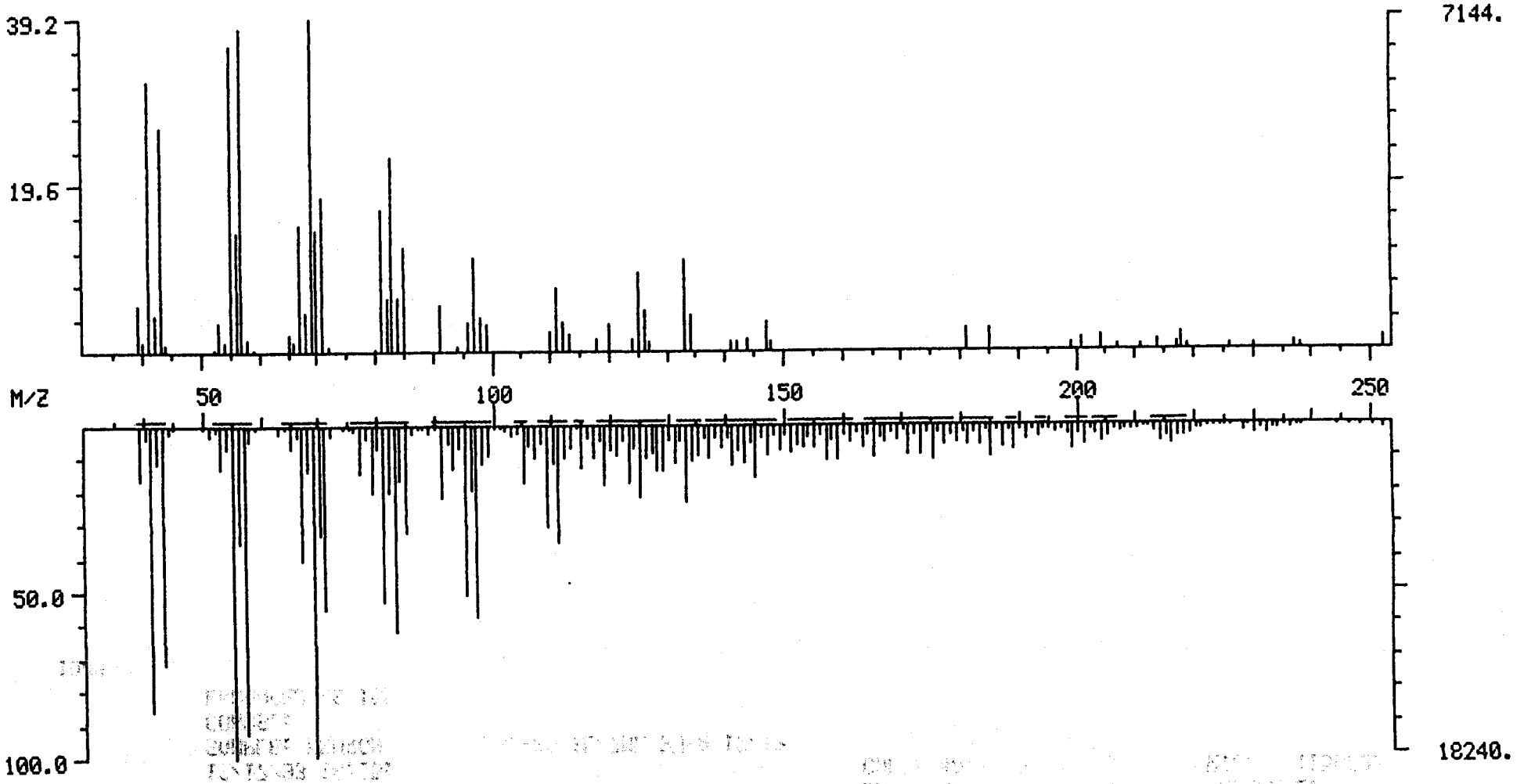
DATA: 4AT13656 #1046
CALI: 4AT13656 # 3

BASE M/Z:
RIC: 77824.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 20:45
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 206 DEG. C
ENHANCED (S 15B 2N 0T)

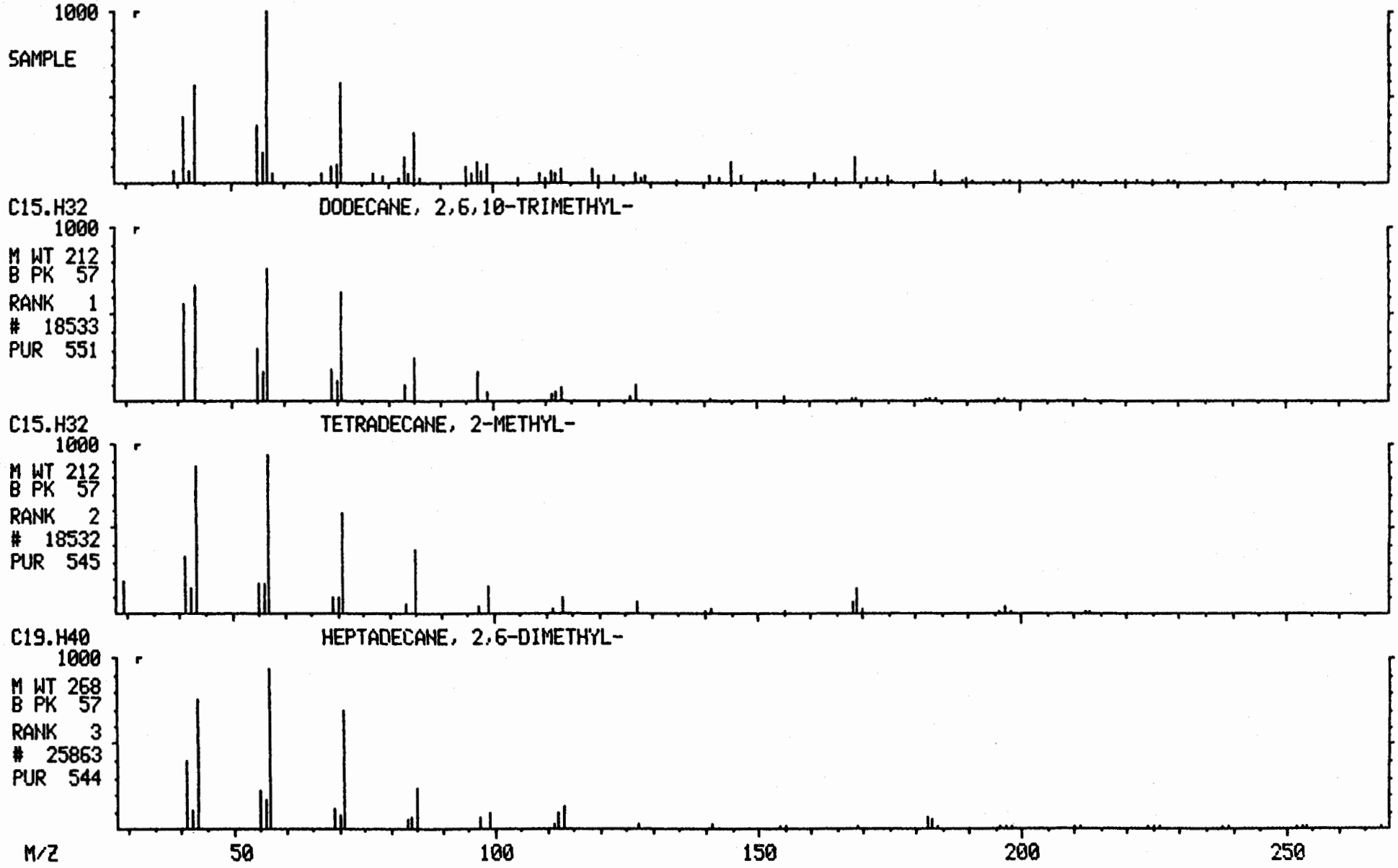
DATA: 4AT13656 #1046 BASE M/Z: 65. 55
CALI: 4AT13656 #3 RIC: 79104./ 346624.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 20:18
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #1023
CALI: 4AT13656 # 3

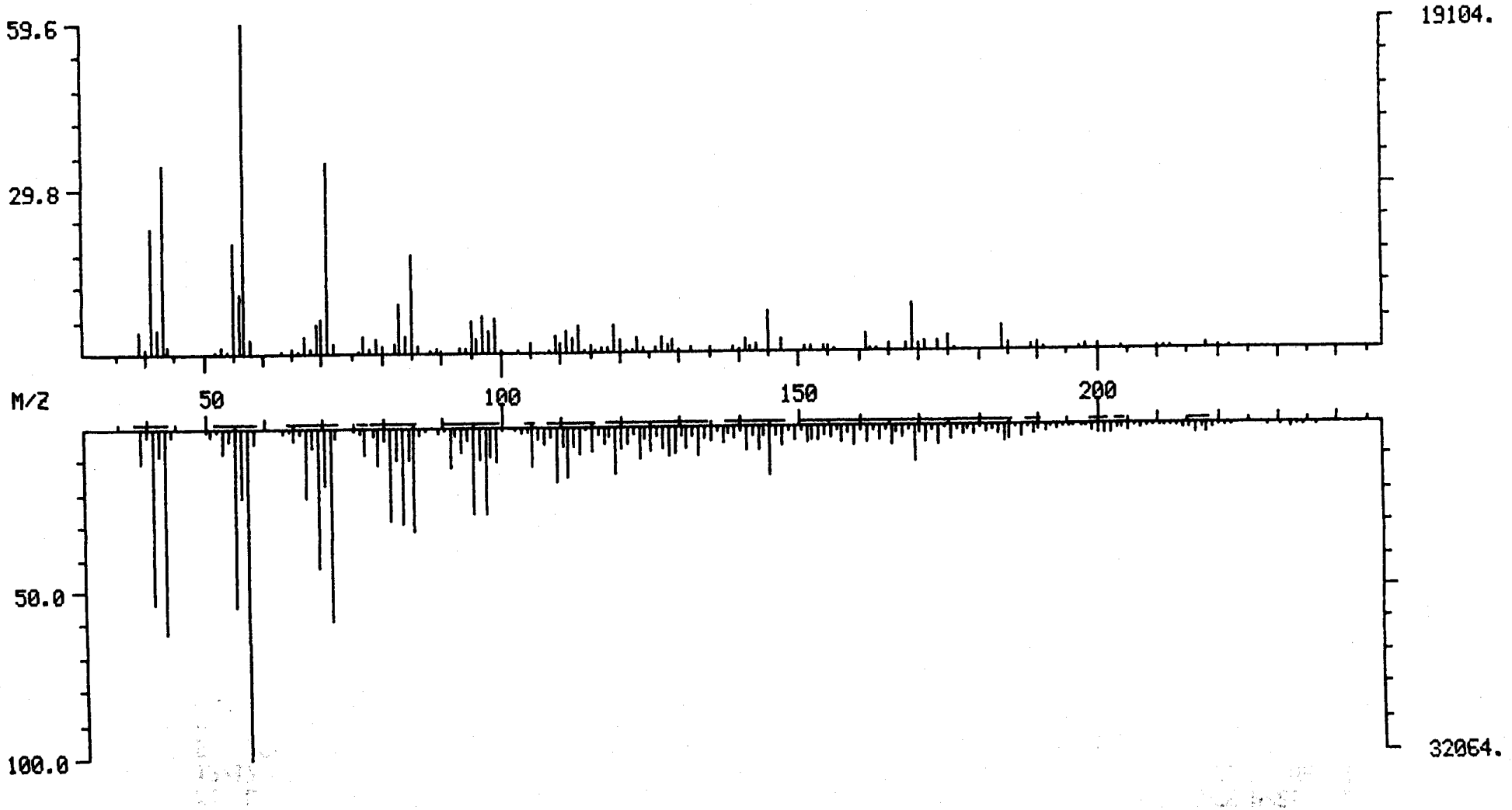
BASE M/Z:
RIC: 115072.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 20:18
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 202 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #1023
CALI: 4AT13656 #3

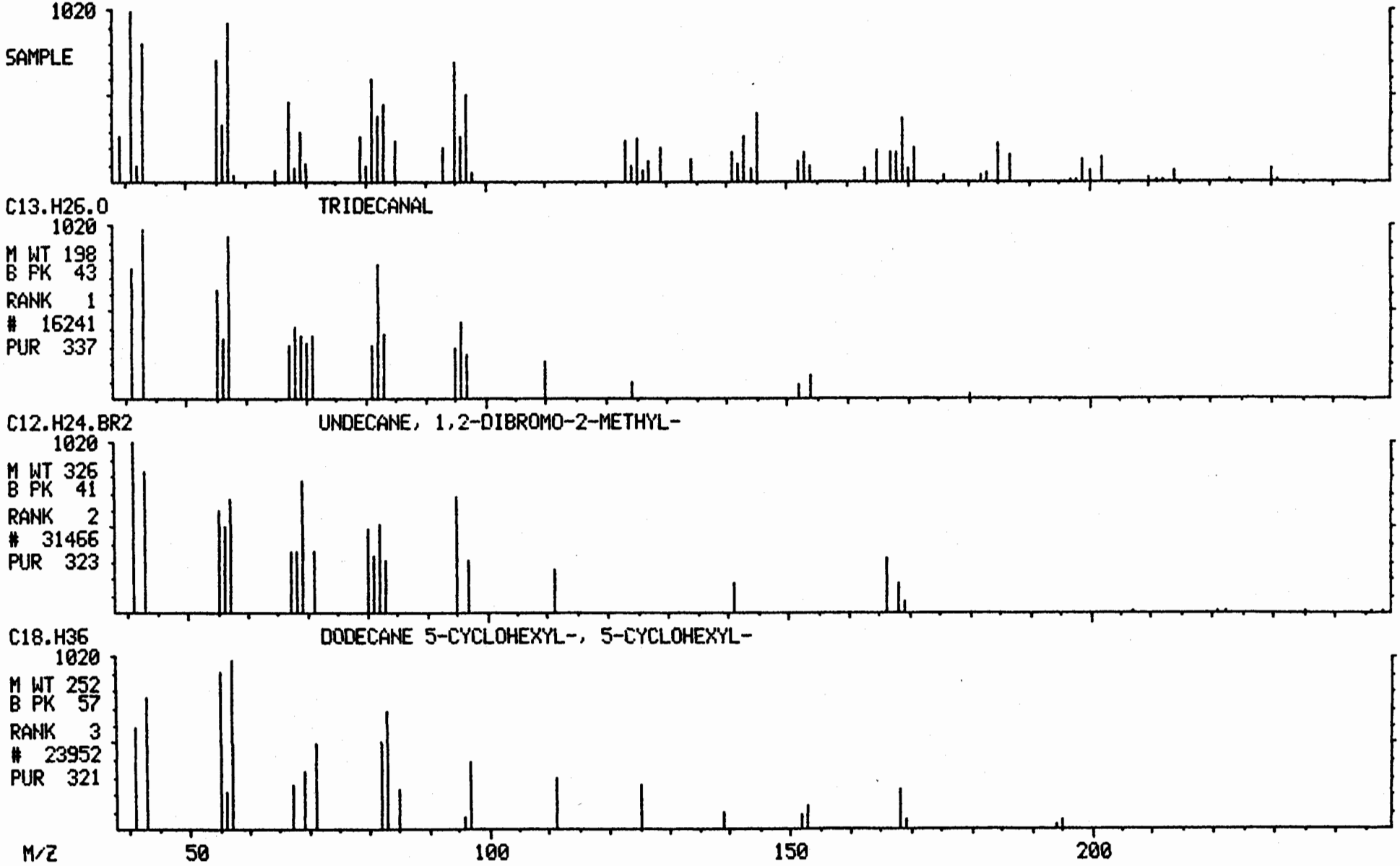
BASE M/Z: 57
RIC: 125056./ 381440.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 20:00
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

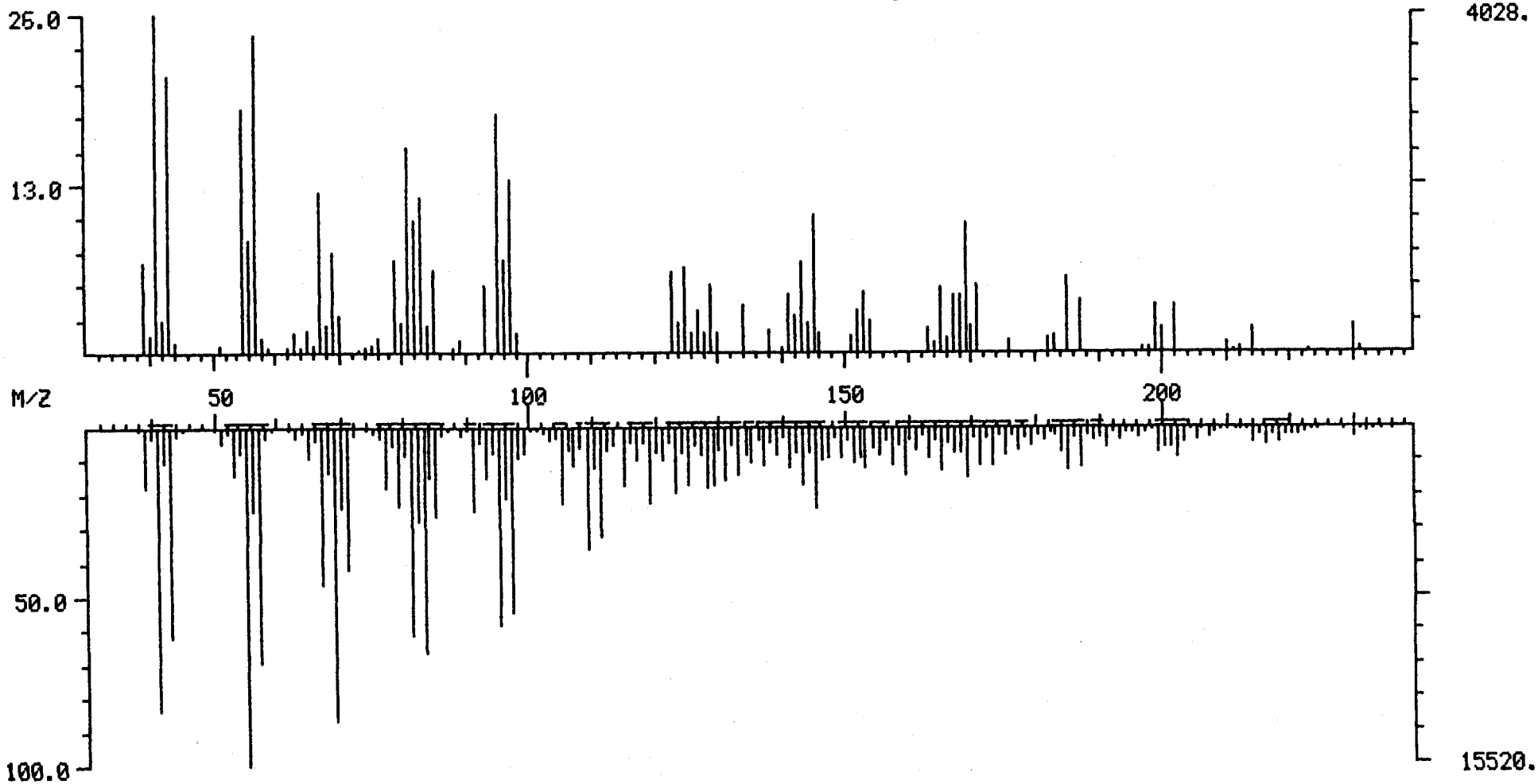
DATA: 4AT13656 #1008
CALI: 4AT13656 # 3

BASE M/Z: [illegible]
RIC: 56832.



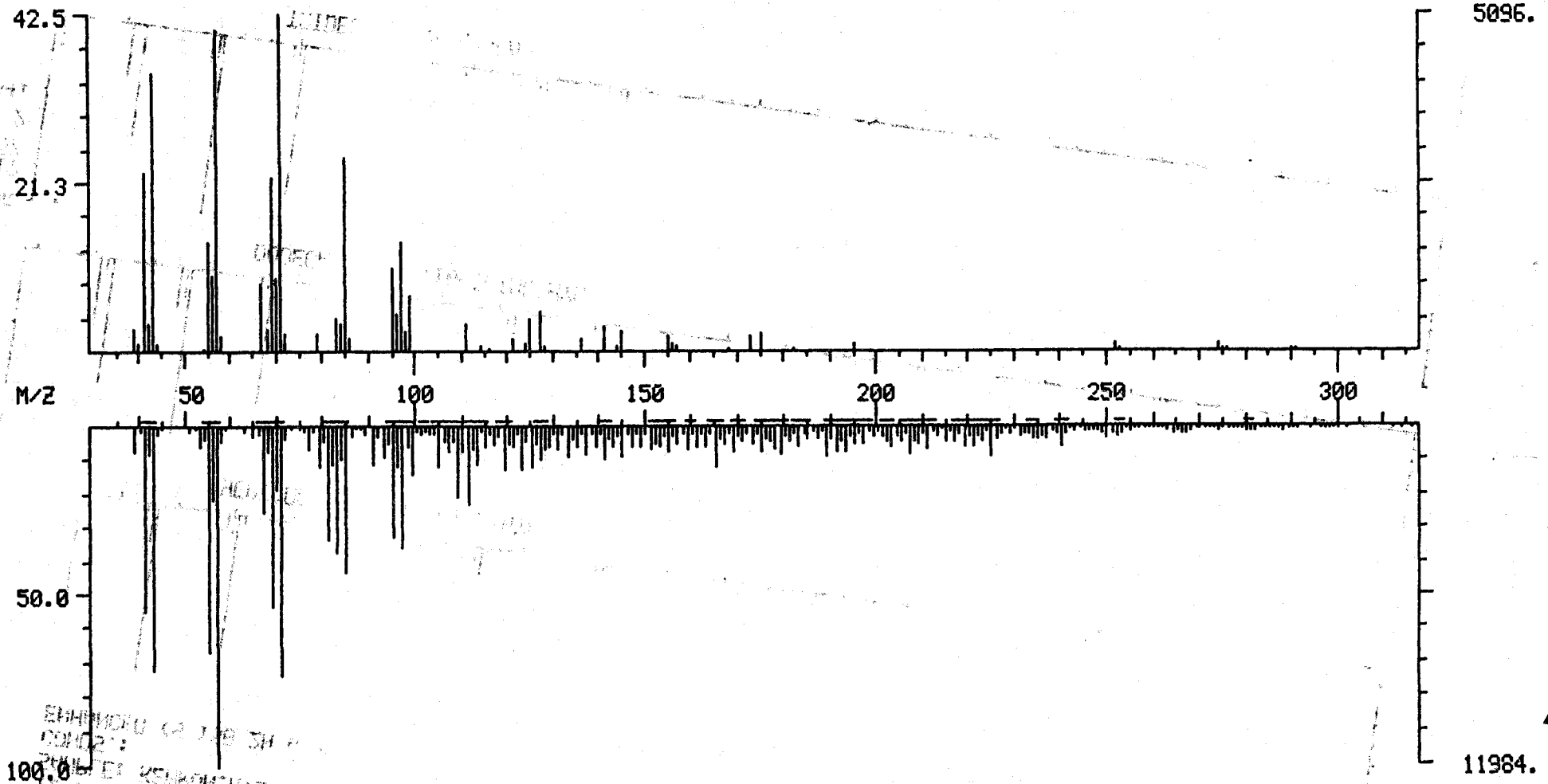
DUAL MASS SPECTRUM
12/17/93 18:15:00 + 20:00
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 199 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #1008 BASE M/Z: 41. 55
CALI: 4AT13656 #3 RIC: 60224./ 306688.



DUAL MASS SPECTRUM
12/17/93 18:15:00 + 26:30
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
TEMP: 264 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #1336 BASE M/Z: 71 57
CALI: 4AT13656 #3 RIC: 39872./ 188416.



MID LIBRARY SEARCH (LIBRARYNB)
12/17/93 18:15:00 + 26:30
SAMPLE: KEMRON_ATL 12-231-05 1L/2ML BN:A 12/13
CONDS.:
ENHANCED (S 15B 2N 0T)

DATA: 4AT13656 #1336
CALI: 4AT13656 # 3

BASE M/Z:
RIC: 39483.