02-8905-06-PA
REV. NO. 0

# FINAL DRAFT
# PRELIMINARY ASSESSMENT
# ORBIS PRODUCTS CORPORATION
# NEWARK, NEW JERSEY

PREPARED UNDER

TECHNICAL DIRECTIVE DOCUMENT NO. 02-8905-06
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JUNE 30, 1989

NUS CORPORATION
SUPERFUND DIVISION


SUBMITTED BY:

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253166

# POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT

## PART I: SITE INFORMATION

1. Site Name/Alias Orbis Products Corporation

   Street 55 Virginia Street

   City Newark State New Jersey Zip 07114

2. County Essex County Code 13 Cong. Dist. 10

3 EPA ID No. NJD010910099

4. Latitude 41° 41' 18"N Longitude 74° 12' 10"W

   USGS Quad. Elizabeth, New Jersey

5. Owner Adron Tel. No. Unknown

   Street Unknown

   City Unknown State Unknown Zip Unknown

6. Operator Orbis Products Corporation Tel. No. (201) 824-3144

   Street 55 Virginia Street

   City Newark State New Jersey Zip 07114

7. Type of Ownership

   ☒ Private ☐ Federal ☐ State
   ☐ County ☐ Municipal ☐ Unknown ☐ Other _____

8. Owner/Operator Notification on File

   ☒ RCRA 3001 Date 10/09/80 ☐ CERCLA 103c Date _____
   ☐ None ☐ Unknown

9. Permit Information

| Permit | Permit No. | Date Issued | Expiration Date | Comments |
|---|---|---|---|---|
| PVSC | 21401032 | Unknown | Unknown | Wastewater treatment |
| NJDEP Air | C-7507 | Unknown | Unknown | |
| NJPDES | NJ0021016 | Unknown | Unknown | |

10. Site Status

    ☒ Active ☐ Inactive ☐ Unknown

11. Years of Operation August 1, 1976 to Present

12. **Identify the types of waste units (e.g., landfill, surface impoundment, piles, stained soil, above- or below-ground tanks or containers, land treatment, etc.) on site. Initiate as many waste unit numbers as needed to identify all waste sources on site.**

(a) **Waste Management Areas**

| Waste Unit No. | Waste Unit Type | Facility Name for Unit |
|---|---|---|
| 1 | Drums | Drum Storage Area |
| 2 | Drum Storage Warehouse | Drum Storage Warehouse |
| 3 | Holding Tank No. 19 A Area | Tank No. OT-100 |
| 4 | Excavation Site of Six Underground Tanks | Unknown |
| 5 | Concrete Holding Tank | Concrete Holding Tank for Waste-Water Treatment System |
| 6 | Three Aboveground Waste Fuel Tanks | Unknown |
| 7 | Former Location of Two 25,000-Gallon Aboveground Tanks | Unknown |

(b) **Other Areas of Concern**

**Identify any miscellaneous spills, dumping, etc. on site; describe the materials and identify their locations on site.**

During an inspection conducted on June 26, 1984, an area of contaminated soil was observed along a fence at the rear of the property. Apparently, rainwater runoff contaminated with oil was entering the site from an adjacent junkyard. In the same area oil-saturated concrete was observed around several aboveground holding tanks. A followup inspection conducted on August 20, 1984, indicated that the contaminated soil near the fence area was "cleaned and spread." No further information is available regarding this situation.

During the inspection conducted on August 20, 1984, inspectors expressed concern about the laboratory area where they found a large container of chlorinated phenols as well as numerous other chemicals scattered about the laboratory. The laboratory appeared to be about 95 percent closed with Lab Packs being prepared in fibre drums for disposal.

Some time between 1983 and November 1986, Orbis products excavated six underground tanks which had been reported to contain hexane, isopropyl alcohol, methanol, and toluol. An inspection conducted on November 18, 1986, revealed holes in three of the tanks. The excavation of the tanks had not been approved by the Bureau of Hazardous Waste Engineering. In August of 1987 subsurface soil samples were collected in the area of the removed tanks. Analysis of the samples indicated the presence of the following chemicals: benzene, toluene, 2-butanone, ethylbenzene, acetone, 2-hexanone, xylenes, chlorobenzene, and petroleum hydrocarbons. Numerous other tentatively identified compounds were also detected. Further sampling is scheduled to occur.

The facility operates a wastewater treatment system which separates waste oils from the effluent. The waste oils were stored and used as supplemental fuel for the facility's three boilers. The facility did not have a permit for this activity. The boilers are now dismantled.

13. **Information available from**

**Contact** Amy Brochu **Agency** U.S. EPA **Tel. No.** (201) 906-6802

**Preparer** Paul Bauer **Agency** NUS Corp. Region 2 FIT **Date** June 30, 1989

## PART II: WASTE SOURCE INFORMATION

**For each of the waste units identified in Part I, complete the following six items.**

**Waste Unit** 1 - Drums, Drum Storage Area

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility originally filed a Notification of Hazardous Waste Activity on August 14, 1980, identifying itself as a treatment, storage or disposal facility (TSDF). On October 9, 1984, Orbis Products was issued a Notice of Violation for storing drums of hazardous waste for more than 90 days. On September 15, 1988, the Bureau of Hazardous Waste Engineering approved a closure plan for an aboveground hazardous waste storage tank, and delisted the drum storage area. The age of the waste unit is unknown, but the plant has been in existence for over 40 years.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The drum storage area is located adjacent to the southeast side of the wastewater treatment area.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The drum storage area measures 20 feet by 65 feet and has a capacity of 5,500 gallons.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical states of the wastes are liquid and sludge.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The drum storage area is believed to have contained p-chlorobenzoyl, sodium hypochloride, allyl isothiocyanate, anisic aldehyde, allyl chloride, manganese salts, and sludge removed from the wastewater treatment tanks.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The containment of the drum storage area is unknown, but it appears that the area has no containment system. An inspection conducted on August 20, 1984 indicated that 90 percent of the drums which formerly rested directly on the ground were placed on wooden pallets. The 10 percent that were not on wooden pallets were either plastic drums or "beyond retainability".

Ref. Nos. 1, 2, 3, 4, 5, 9

## PART II: WASTE SOURCE INFORMATION

**For each of the waste units identified in Part I, complete the following six items.**

**Waste Unit** 2 - Drum Storage Warehouse, Drum Storage Warehouse

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility originally filed a Notification of Hazardous Waste Activity on August 14, 1980, identifying itself as a treatment, storage, or disposal facility (TSDF). On October 9, 1984, Orbis Products was issued a Notice of Violation for storing hazardous waste in drums for more than 90 days. On September 15, 1988, the Bureau of Hazardous Waste Engineering approved a closure plan for an aboveground hazardous waste storage tank, and delisted the drum storage area. The age of the waste unit is unknown, but the plant has been in existence for over 40 years.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The drum storage warehouse is located in the west corner of the property adjacent to the railroad tracks.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The warehouse measures 130 feet by 120 feet. During an inspection conducted on June 26, 1984, approximately 1200 drums were observed in the building. The building has several levels (possibly five). Apparently drums have also been stored immediately outside the warehouse. A more recent inspection conducted on November 17, 1986, indicated that there were 60 to 100 drums stored in the warehouse.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical states of the waste are liquid and sludge.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The warehouse is used to store still bottom residues consisting of p-chlorobenzoyl, sodium hypochloride, allyl isothiocyanate, anisic aldehyde, and sludge removed from the wastewater treatment system.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   During inspections conducted on June 26, 1984, the warehouse was reported to be in a general state of dilapidation. All windows had been broken; doors remained open; and leaking drums stacked three high, with no aisle space and little or no identification, were sitting in pools of liquid. The drums were exposed to the elements via overhead leaks. The inspections were originally conducted in response to a complaint of chemical odors emanating from the warehouse. A followup inspection conducted on August 20, 1984, indicated that the area outside the warehouse had been cleaned up. Inside the warehouse Orbis had begun to use overpack drums apparently to contain the leaking drums.

Ref. Nos. 1, 2, 3, 4, 5, 9

## PART II: WASTE SOURCE INFORMATION

**For each of the waste units identified in Part I, complete the following six items.**

**Waste Unit** 3 - Holding Tank No. 19A Area, Tank No. OT-100

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility originally filed a Notification of Hazardous Waste Activity on August 14, 1980, identifying itself as a treatment, storage, or disposal, facility (TSDF). On September 15, 1988, the Bureau of Hazardous Waste Engineering approved a closure plan for an aboveground hazardous waste storage tank. The age of the waste unit is unknown, but the plant has been in existence for over 40 years. Although it is not clearly stated in any of the available information, it appears that holding tank No. 19 A and tank No. OT-100 are the same tank.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The exact location of the tank is unknown; however, it is apparently located near a fence at the rear of the property that separates Orbis Products from a junkyard.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The capacity of the tank is apparently 10,000 gallons. The quantity of material in the tank is unknown. The quantity of contaminated soil reported to be around the tank is also unknown.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical states of the waste are liquid and solid (contaminated soil).

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The specific hazardous substance located in Holding Tank No. 19A is unknown. During an inspection conducted on August 20, 1984, it was indicated that a submersible pump associated with the tank was covered with a very heavy oil-type substance. The plant manager identified the substance as spent solvents. Apparently the soil around the tank had become saturated with the material. The soil was covered over with clean sand.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The containment of the holding tank is unknown; however, the tank is apparently constructed of steel.

Ref. Nos. 1, 2, 3, 4, 9

## PART II: WASTE SOURCE INFORMATION

**For each of the waste units identified in Part I, complete the following six items.**

**Waste Unit** 4 - Excavation Site of Six Underground Tanks, Unknown

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility originally filed a Notification of Hazardous Waste Activity on August 14, 1980, identifying itself as a treatment, storage, or disposal facility (TSDF). The age of the waste unit is unknown, but the plant has been in existence for over 40 years. During an inspection conducted on November 18, 1986, it was discovered that six underground tanks had been excavated without the prior knowledge or approval of the Bureau of Hazardous Waste Engineering. Since the discovery, sampling has been conducted and apparently some remediation has occurred. Further sampling is scheduled, and it is anticipated by the Division of Hazardous Waste Management that the installation of monitoring wells will be required.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   It appears that the site is located south of the main building and west of the cooling tower.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The quantity of contaminated soil located at the excavation site is unknown. The capacity of the excavated tanks is also unknown.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical state of the waste is solid (soil).

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The hazardous substances that the company had indicated were stored in tanks are hexane, isopropyl alcohol, methanol, and toluol. Analysis of four subsurface soil samples collected from the area where the tanks had been removed indicated the presence of the following chemicals: benzene, chlorobenzene, ethylbenzene, toluene, acetone, 2-hexanone, xylenes, and 2-butanone. Numerous other compounds have been tentatively identified.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   Three of the six excavated tanks were observed to have holes in them. The three tanks released contaminants to the surrounding soil; therefore, there is no containment.

Ref. Nos. 1; 7; 9; 25, pp.7, 8, 37, 38, 94, 95, 154

## PART II: WASTE SOURCE INFORMATION

**For each of the waste units identified in Part I, complete the following six items.**

**Waste Unit** 5 - Concrete Holding Tank — Concrete Holding Tank for Wastewater Treatment System

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility originally filed a Notification of Hazardous Waste Activity on August 14, 1980, identifying itself as a treatment, storage, or disposal facility (TSDF). On May 16, 1986, the facility's wastewater treatment system was approved as an Industrial Waste Management Facility (IWMF), and a permit for the facility was issued by the Division of Water Resources. The age of the waste unit is unknown; however, the plant has been in existence for over 40 years.

   During an inspection conducted on June 26, 1984 facility personnel indicated that sludge had never been removed from the waste unit. Available information indicates that the waste unit is no longer operable. A sodium hydroxide solution was metered to the waste unit to neutralize the acidic waste stream. During an inspection conducted on August 20, 1984, facility personnel indicated that the contents of the sodium hydroxide tank had been sold and that removal of the contents had been scheduled to occur on August 28, 1984. Therefore, it appears that the wastewater treatment system is no longer in use. The current status of the waste unit is unknown.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The wastewater treatment facility is located at the rear of the facility, north of the warehouse and the drum storage area.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The wastewater treatment system consists of two aboveground 10,000-gallon steel tanks and a ground-level concrete tank. The concrete tank measures approximately 20 feet by 40 feet and is 8 feet deep. The unit is divided into two sections: the first section is used as a skimmer, and the second section has central agitation. An inspection conducted on June 26, 1984 indicated the capacity of the concrete structure as 20,000 gallons; however, simple calculations of the tank's volume indicates that the tank's actual capacity would be approximately 40,000 gallons. This corresponds with the inspector's estimation of the quantity of sludge in the unit of 37,000 gallons.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical state of the wastes are sludge and possibly liquid.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The hazardous substance present in the waste unit is sludge and an oil film on the surface of the water.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The tank is constructed of concrete and reportedly contains no liner. However, the tank may possess a natural clay barrier at the bottom.

Ref. Nos. 1, 2, 3, 4, 6, 7

## PART II: WASTE SOURCE INFORMATION

**For each of the waste units identified in Part I, complete the following six items.**

**Waste Unit** 6 -Three Aboveground Waste Fuel Tanks Unknown

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility filed a Notification of Hazardous Waste Activity on August 14, 1980, identifying itself as a treatment, storage, or disposal facility (TSDF). The age of the waste unit is unknown; however, the plant has been in existance for over 40 years.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   Unknown

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The waste unit consists of three 10,000-gallon aboveground waste fuel oil tanks. The current quantity of waste fuel in the tanks is unknown.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical state of the waste is liquid.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The hazardous substance present in the tanks is waste fuel oil.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   The three tanks are diked with concrete walls to a height of 4 feet.

   Ref. Nos. 1, 4

## PART II: WASTE SOURCE INFORMATION

**For each of the waste units identified in Part I, complete the following six items.**

**Waste Unit** 7 - Former Location of Two 25,000-Gallon Aboveground Tanks Unknown

1. **Identify the RCRA status and permit history, if applicable, and the age of the waste unit.**

   The facility filed a Notification of Hazardous Waste Activity on August 14, 1980, identifying itself as a treatment, storage, or disposal facility (TSDF). During an inspection conducted on November 17, 1986, it was discovered that Orbis Products had removed two 25,000-gallon aboveground waste tanks, apparently without the prior knowledge or approval of the Bureau of Hazardous Waste Engineering.

2. **Describe the location of the waste unit and identify clearly on the site map.**

   The location of the waste unit is unknown.

3. **Identify the size or quantity of the waste unit (e.g., area or volume of a landfill or surface impoundment, number and capacity of drums or tanks). Specify the quantity of hazardous substances in the waste unit.**

   The size and quantity of the waste unit is unknown.

4. **Identify the physical state(s) of the waste type(s) as disposed of in the waste unit. The physical state(s) should be categorized as follows: solid, powder or fines, sludge, slurry, liquid, or gas.**

   The physical state of the waste is unknown.

5. **Identify specific hazardous substance(s) known or suspected to be present in the waste unit.**

   The tanks had been used to store waste solvents.

6. **Describe the containment of the waste unit as it relates to contaminant migration via groundwater, surface water, and air.**

   Unknown.

   Ref. Nos. 1, 7

# PART III: HAZARD ASSESSMENT

## GROUNDWATER ROUTE

1. **Describe the likelihood of a release of contaminant(s) to the groundwater as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

   There is a potential for a release of contaminants to the groundwater. There has been an observed release of contaminants to subsurface soils, and there is no containment of the contaminated soil. The chemical compounds detected in subsurface soils are benzene, chlorobenzene, ethylbenzene, toluene, acetone, 2-hexanone, xylenes, 2-butanone, and petroleum hydrocarbons.

   Ref. Nos. 2, 3, 4, 7

2. **Describe the aquifer of concern; include information such as depth, thickness, geologic composition, permeability, overlying strata, confining layers, interconnections, discontinuities, depth to water table, groundwater flow direction.**

   In the Newark and Elizabeth area the Brunswick Formation serves as the aquifer of concern. The Brunswick Formation, which forms the bedrock, may exceed 6000 feet in thickness and is composed of shale and sandstone with local occurrences of sandy and pebbly consolidated beds. The Brunswick Formation is overlain by and hydraulically connected to the Pleistocene glacial deposits. The depth of the deposits varies and is largely controlled by the underlying bedrock topography. A buried valley exists under the Newark and Elizabeth area which is filled with stratified drift and interbedded lenses of till. In the southern part of Newark, the main valley is filled with as much as 200 feet of lacustrine clay and sandy clay which is overlain by 50 to 100 feet of other stratified and unstratified glacial drift. The thickness of the Pleistocene glacial deposits in the vicinity of the site is approximately 70 feet. However, the overall thickness of unconsolidated material in the area of the site ranges from approximately 40 to 160 feet. The depth to bedrock in the vicinity of the site ranges from approximately 40 to 160 feet. Confined and semiconfined groundwater exist in lowland areas of Newark. Because of heavy pumping, parts of the confined aquifer have become dewatered and are no longer confined. The confined condition is a result of variations in fracturing or weathering within the Brunswick Formation. The water table in the Newark area is greatly affected by local pumping and seasonal recharge. The water table in the vicinity of the site is approximately 35-40 feet below ground surface. Saltwater intrusion has made the water unsuitable for drinking or irrigation purposes. The direction of groundwater flow is influenced by local pumping and tends to move in either a southwest or northeast direction, parallel to the strike of the bedrock.

   Ref. Nos. 10, pp. 5-11, 15, 19, 20, Table 2, Figures 2, 4; 11

3. **Is a designated sole source aquifer within 3 miles of the site?**

   There is no designated sole source aquifer within 3 miles of the site.

   Ref. Nos. 12, 13

4. **What is the depth from the lowest point of waste disposal/storage to the highest seasonal level of the saturated zone of the aquifer of concern?**

   The lowest point of waste storage is in the vicinity of the six excavated underground storage tanks. The depth is assumed to be 6 feet below ground surface. The depth from the waste area to the aquifer of concern is approximately 29 to 34 feet.

   Ref. No. 7; 10, p. 19

5. **What is the permeability value of the least permeable continuous intervening stratum between the ground surface and the aquifer of concern?**

The least permeable continuous intervening stratum between the ground surface and the aquifer of concern is the Pleistocene glacial deposits which have permeability of approximately $10^{-5}$ to $10^{-7}$ cm/sec.

Ref. Nos. 10, pp. 9-11; 14, p. 15

6. **What is the net precipitation for the area?**

The net precipitation for the area is approximately 13 inches annually.

Ref. Nos. 14, pp. 13-14

7. **Identify uses of groundwater within 3 miles of the site (i.e., private drinking source, municipal source, commercial, industrial, irrigation, unusable).**

Groundwater within 3 miles of the site is used for industrial purposes.

Ref. Nos. 15, 16, 17

8. **What is the distance to and depth of the nearest well that is currently used for drinking or irrigation purposes?**

**Distance** N/A **Depth** N/A

Ref. Nos. 15, 16, 17

9. **Identify the population served by the aquifer of concern within a 3-mile radius of the site.**

There is no population served by the aquifer of concern within a 3-mile radius of the site.

Ref. Nos. 15, 16, 17

**SURFACE WATER ROUTE**

10. **Describe the likelihood of a release of contaminant(s) to surface water as follows: observed, alleged, potential, or none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminants to the facility.**

There is little likelihood of a release of contaminants to surface water, because there are no apparent migration pathways to surface water. Rainwater runoff at the site drains into the storm sewer system which is connected to a permitted IWMF wastewater treatment system. Effluent from the treatment system is discharged to the Passaic Valley Sewage Treatment Plant. Storm sewers on McClellen and Virginia Streets also discharge to the Passaic Valley Sewage Treatment Plant.

Ref. Nos. 2, 18, 19, 30

11. **Identify and locate the nearest downslope surface water. If possible, include a description of possible surface drainage patterns from the site.**

Weequahic Lake is located approximately 3,800 feet north of the site. However, there are no apparent migration pathways from the site to the lake. Storm sewers discharge to the Passaic Valley Sewage Treatment Plant and then Newark Bay both of which are over 3 miles downstream from the site.
Ref. No. 18

12. **What is the facility slope in percent? (Facility slope is measured from the highest point of deposited hazardous waste to the most downhill point of the waste area or to where contamination is detected.)**

The facility slope is less than 3 percent.

Ref. Nos. 18, 19

13. **What is the slope of the intervening terrain in percent? (Intervening terrain slope is measured from the most downhill point of the waste area to the probable point of entry to surface water.)**

The slope of the intervening terrain is less than 3 percent.

Ref. No. 18

14. **What is the 1-year 24-hour rainfall?**

The 1-year 24-hour rainfall is approximately 2.75 inches.

Ref. Nos. 14, p. 33

15. **What is the distance to the nearest downslope surface water? Measure the distance along a course that runoff can be expected to follow.**

The distance to the nearest surface water, Weequahic Lake, is approximately 3,800 feet; however, there is no apparent migration pathway that leads to it. The runoff from the site would be expected to discharge to the Passaic Valley Sewage Treatment Plant and then to the Newark Bay both of which are over 3 miles downstream from the site.

Ref. No. 18

16. **Identify uses of surface waters within 3 miles downstream of the site (i.e., drinking, irrigation, recreation, commercial, industrial, not used).**

Newark Bay is used for commercial and industrial purposes. Secondary recreational contact may also occur.

Ref. Nos. 18, 21, 23

17. **Describe any wetlands, greater than 5 acres in area, within 2 miles downstream of the site. Include whether it is a freshwater or coastal wetland.**

There are no wetland areas within 2 miles of the site.

Ref. Nos. 18, 23

18. **Describe any critical habitats of federally listed endangered species within 2 miles of the site along the migration path.**

There are no critical habitats of federally listed endangered species within 2 miles of the site.

Ref. No. 22

19. **What is the distance to the nearest sensitive environment along or contiguous to the migration path (if any exist within 2 miles)?**

Not applicable. There is no sensitive environment within 2 miles.

Ref. No. 22

20. **Identify the population served or acres of food crops irrigated by surface water intakes within 3 miles downstream of the site and the distance to the intake(s).**

There are no surface water intakes within 3 miles downstream.

Ref. Nos. 16, 17, 18, 20

21. **What is the state water quality classification of the water body of concern?**

The state water quality classification for Newark is SE-3.

Ref. No. 23

**22. Describe any apparent biota contamination that is attributable to the site.**

There have been no reported incidents of biota contamination attributable to the site.

Ref. Nos. 2, 3, 4, 7, 19

**AIR ROUTE**

**23. Describe the likelihood of a release of contaminant(s) to the air as follows: observed, alleged, potential, none. Identify the contaminant(s) detected or suspected, and provide a rationale for attributing the contaminant(s) to the facility.**

At the present time the potential for a release of contaminants to the air is unknown; however, the New Jersey Department of Environmental Protection has twice had to respond to complaints of chemical odors emanating from the site. On May 24, 1984, the Newark Health Department received a neighborhood complaint of odors emanating from an accumulation of drums in a warehouse. Subsequently, the NJDEP and the Newark Health Department conducted several joint inspections of the site. The inspections revealed the presence of 1,200 drums of chemicals improperly stored in the warehouse. An unknown number of drums were leaking, and an acidic odor was noted. On November 17, 1986, the NJDEP received a complaint of chemical odors emanating from Orbis Products warehouse. Upon arrival at the site the inspector noted faint aromatic vapors from the street. The inspector was not given access to the warehouse. Contaminants potentially present on the site include hexane, isopropyl alcohol, methanol, toluol, p-chlorobenzoyl, sodium hypochloride, allyl isothiocyanate, anisic aldehyde, allyl chloride, benzene, toluene, 2-butanone, ethyl benzene, acetone, 2-hexanone, xylene, chlorobenzene, and petroleum hydrocarbons.

Ref. Nos. 2, 4, 7, 25, pp.7, 37, 65, 94

**24. What is the population within a 4-mile radius of the site?**

Approximately 457,900 people live within 4 miles of the site.

Ref. No. 24

**FIRE AND EXPLOSION**

**25. Describe the potential for a fire or explosion to occur with respect to the hazardous substance(s) known or suspected to be present on site. Identify the hazardous substance(s) and the method of storage or containment associated with each.**

The present potential for a fire or explosion to occur with respect to the hazardous substances stored on site is unknown. Initial inspections indicated that a dangerous situation existed in the warehouse; however, most, if not all, of the drums have since been removed from the warehouse. Formerly the warehouse contained leaking drums of flammable and reactive materials. The facility was issued Notices of Violation (NOVs) for storing containers less than 50 feet from the property line, for not protecting wastes from ignition or reaction, failure to follow requirements for ignitable or reactive waste storage, failure to post no smoking signs, failure to close containers, failure to segregate hazardous waste, and numerous other violations. It is not known whether the warehouse has been cleaned.

Ref. Nos. 2, 3, 4, 7

**26. What is the population within a 2-mile radius of the hazardous substance(s) at the facility?**

Approximately 100,400 people live within 2 miles of the site.

Ref. No. 24

## DIRECT CONTACT/ON-SITE EXPOSURE

**27. Describe the potential for direct contact with hazardous substance(s) stored in any of the waste units on site or deposited in on-site soils. Identify the hazardous substance(s) and the accessibility of the waste unit.**

There is some potential for direct contact with hazardous substances on site. Although the area is fenced, the fence is in poor condition and the general housekeeping at the site has been poor. There are also two potential areas of surface soil contamination. One area is around the steel tank (OT-100) for which Orbis received approval of its closure plan. The second area is along the fence that separates Orbis Products from a junkyard. Other potential areas for direct contact are the warehouse, the drum storage area, and the area of the excavated underground tanks.

Ref. Nos. 2, 3, 4, 7, 19

**28. How many residents live on a property whose boundaries encompass any part of an area contaminated by the site?**

No residents live on a property whose boundaries encompass any part of an area contaminated by the site.

Ref. Nos. 18, 19

**29. What is the population within a 1-mile radius of the site?**

Approximately 26,700 people live within 1 mile of the site.

Ref. No. 24

# PART IV: SITE SUMMARY AND RECOMMENDATIONS

Orbis Products Corp. is located in Essex County at 55 Virginia Street, Newark, New Jersey, and covers approximately 5.5 acres. The facility is situated in a narrow commercial strip that extends to the north and south. The strip is bounded by a residential area to the west and railroad tracks to the east. Orbis Products, a subsidiary of the Adron Corporation, has been in operation since 1976; however, the plant has been in existence for over 40 years. The facility has been a manufacturer of aromatic chemicals, pharmaceuticals, organic intermediates, fragrances, and flavors. Some time between 1983 and November of 1986 the facility ceased the manufacture of all products except non-hazardous flavorings for food.

The facility is classified as a treatment, storage, or disposal facility and is currently working toward being reclassified as a generator only. The company originally listed two waste units in its Hazardous Waste Permit Application. One waste unit is a wastewater treatment system which became classified as an Industrial Waste Management Facility (IWMF) on June 11, 1986, and is now permitted and regulated by the New Jersey Department of Environmental Protection (NJDEP), Division of Water Resources. The system discharges its effluent to the Passaic Valley Sewage Treatment Plant. During an inspection conducted on June 26, 1984, facility personnel indicated that sludge has never been removed from the waste unit. Inspectors estimated the quantity of sludge in the tank to be approximately 37,000 gallons. The tank's capacity is estimated to be approximately 40,000 gallons. During a followup inspection conducted on August 20, 1984, facility personnel indicated that they had sold the contents of a tank containing sodium hydroxide which is used to adjust the pH level of the waste stream. It appears that the waste unit is no longer in use.

The second waste unit listed is a drum storage area with a capacity of 5,500 gallons (110, 55-gallon drums). The area is adjacent to the southeast side of the wastewater treatment system. The containment of the outside drum storage area is unknown. On September 15, 1988, the Bureau of Hazardous Waste Engineering (BHWE) delisted the outside drum storage area based on an affidavit made by the facility supervisor, which stated that the facility had never stored hazardous waste in containers for greater than 90 days. However, the facility was issued a Notice of Violation (NOV) on October 9, 1984, by the Division of Hazardous Waste Management (DHWM) for storing 44 drums containing hazardous waste for approximately 4 years.

A 10,000-gallon aboveground steel tank that had been used to store hazardous waste had originally been considered part of the wastewater treatment system; however, this tank did not qualify as an IWMF, and the facility decided to remove the tank. The BHWE approved a closure plan for the removal of the tank on September 15, 1988. The tank was identified in the closure plan as tank No. OT-100. It appears that this is the same one identified in the available information as holding tank No. 19A. The current status of the tank is unknown.

The facility has been using a warehouse on site to store hazardous waste. The warehouse was used to store still bottom residues consisting of p-chlorobenzoyl, sodium hypochloride, allyl isothiocyanate, anisic aldehyde, and sludge removed from the wastewater treatment system. Inspections conducted in July and August of 1984 indicated that conditions in the warehouse were very poor. The building was reported to be in a general state of dilapidation. Approximately 1200 drums were stored inside the warehouse in an unsafe manner. Unlabeled and improperly labeled drums were stacked three high without adequate aisle space. The drums were exposed to the elements via overhead leaks. An unknown quantity of drums was reported to be corroded and leaking. The drums were sitting in pools of liquid that gave off an acidic odor. The inspections were originally conducted in response to neighborhood complaints to the Health Department of chemical odors emanating from the warehouse. During an inspection conducted on November 17, 1986, facility personnel indicated that the drum storage warehouse contained 61 drums of sludge; however, NJDEP inspectors were not given access to the warehouse to confirm this. Inspectors did look through some broken windows and observed approximately 100 drums in the warehouse.

An inspection on November 18, 1986 revealed that some time between 1983 and November 1986, Orbis Products had excavated six underground tanks without the prior approval of the BHWE. Inspectors observed holes in three of the six tanks excavated and required Orbis Products to conduct sampling of the excavation site. In August of 1987, subsurface soil samples were collected in the area of the removed tanks. Analysis of the samples revealed the presence of benzene, toluene, 2-butanone, ethyl benzene, chloroform, acetone, 2-hexanone, xylenes, and chlorobenzene, as well as numerous other tentatively identified compounds. Some soils have been removed and further sampling is expected to occur. The DHWM anticipates that the installation of monitoring wells will be required. Orbis Products also removed two 25,000-gallon aboveground tanks, apparently without the approval of the DHWE. No further information is available concerning these tanks.

There are three 10,000-gallon aboveground waste fuel oil tanks located on the site. During an inspection conducted on November 17, 1986, a 6,500-gallon tank wagon was observed removing waste fuel oil from these tanks. No other information is available concerning these tanks.

The inspection conducted on June 26, 1984, also indicated two areas of obvious soil contamination. One area along the back fence, appears to be the result of oil-contaminated rainwater entering the site from an adjacent junkyard. A second area of soil contamination is apparently located around the 10,000-gallon steel tank for which the facility has received closure approval (Holding Tank No. 19A / Tank No. OT-100).

Other areas of concern noted in the available information are two 10,000-gallon underground fuel tanks, two process buildings that were labeled on the plot plan included in the sample analysis report as "Two Story Asbestos Buildings", and several piles of soil and material identified as kiln dust located along one side of the warehouse.

The DHWM has indicated that conditions at the site have improved since the inspections conducted in 1984; however, the site still has problems to address. The DHWM indicated that the site will be referred to Planning Reassessment and probably be assigned to Case Management, a department that supervises sites that will require long-term remediation or monitoring. There are apparently enforcement actions pending against Orbis Products for minor paperwork violations

The environmental media of greatest concern are the underlying soils and groundwater since there is quantitative evidence that the soils have already been contaminated. There is also a possibility that the site has released contaminants to the air. There is some potential for direct contact with hazardous substance stored on site. Most, if not all, of the drums on site have been removed, and the facility now manufactures only nonhazardous food flavorings. However, the fence surrounding the facility in poor condition, and there are several areas of possible contamination on site.

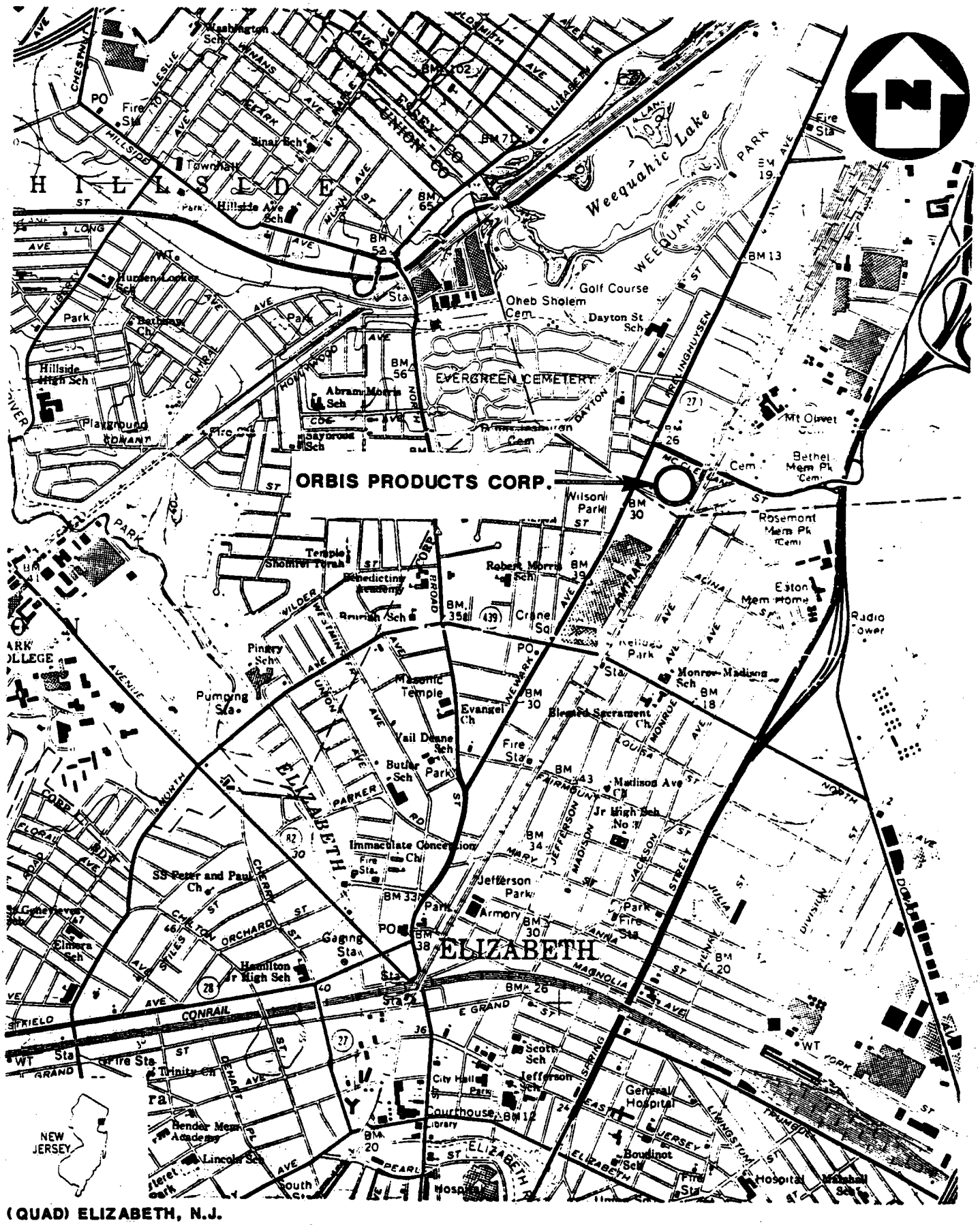
A **MEDIUM PRIORITY** for further action is recommended for this site. The extent of the NJDEP cleanup operations should be determined, and all available data should be collected. If it is deemed necessary that a site inspection be conducted, there are several areas that should be addressed. Several inspections indicated that spills had occurred in the warehouse; however, there is no indication that the warehouse has been cleaned or tested. Appropriate samples should be taken in and around the warehouse, including the piles of kiln dust located beside the warehouse. Soil samples should be collected in the two areas where inspectors observed obvious soil contamination: along the rear fence and around tank No. 19A (Tank OT-100). Water samples should be collected from any monitoring wells that may be installed. Although the BHWE has delisted the drum storage area, soil samples should still be collected since inspectors reported drums that were "beyond retainability". Soil samples should be collected around the concrete holding tank of the wastewater treatment system. Because of the age of the facility and the poor housekeeping practices at the site, the integrity of all tanks on site should be verified.

ATTACHMENT 1

ORBIS PRODUCTS CORP.
NEWARK, NEW JERSEY

CONTENTS

Figure 1: Site Location Map
Figure 2: Site Map
Exhibit A: Photograph Log




(QUAD) ELIZABETH, N.J.

**FIGURE 1**

## SITE LOCATION MAP

## ORBIS PRODUCTS CORP., NEWARK, N.J.

SCALE: 1" = 2000'

NUS CORPORATION

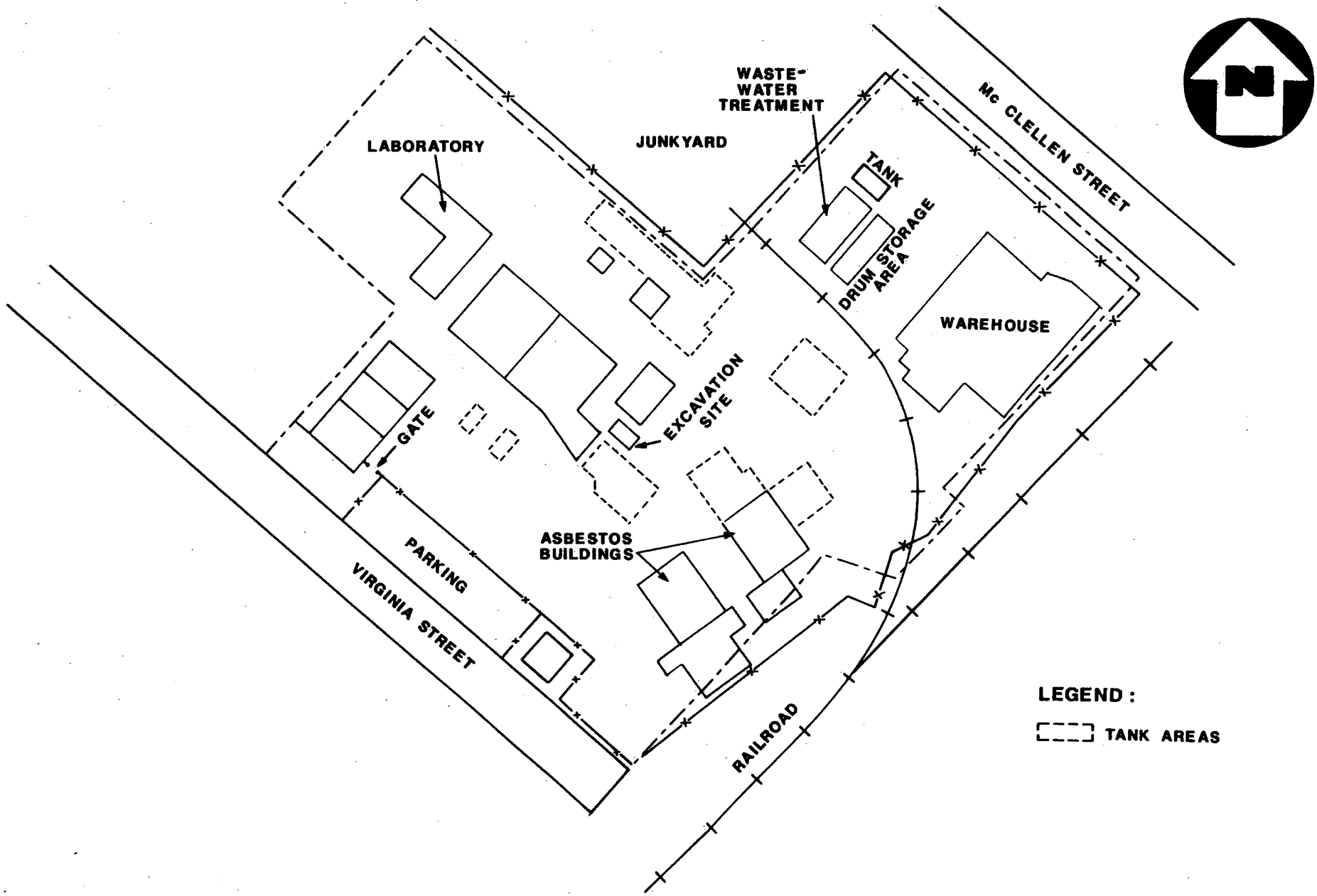



FIGURE 2

**SITE MAP**

**ORBIS PRODUCTS CORP., NEWARK, N.J.**

(NOT TO SCALE)

NUS CORPORATION

02-6605-06-PA
Rev. No. 0

# EXHIBIT A

## PHOTOGRAPH LOG

ORBIS PRODUCTS CORP.
NEWARK, NEW JERSEY

OFF-SITE RECONNAISSANCE: MAY 11, 1989

ORBIS PRODUCTS CORP.
NEWARK, NEW JERSEY
MAY 11,1989

PHOTOGRAPH INDEX

| Photo Number | Description | Time |
|---|---|---|
| 1S,P | Edge of building by railroad track. | 1007 |
| 2S,P | Building by tracks looking east. | 1011 |
| 3S,P | Main building with tanks and trailers. | 1011 |

All photographs taken by Dennis Foerter.

ORBIS PRODUCTS CORP.
NEWARK, NEW JERSEY

1S,P May 11, 1989 1007
Edge of building by railroad track.

2S,P May 11, 1989 1011
Building by tracks looking east.

ORBIS PRODUCTS CORP.
NEWARK, NEW JERSEY

3S,P May 11, 1989 1011
Main building with tanks and trailers.

ATTACHMENT 2

# REFERENCES

1. United States Environmental Protection Agency Forms, 8700-12(6-80), 3510-1(6-80), 3510-3 (6-80).

2. NJDEP Memorandum from Joseph Hoyle to file, Subject: Orbis Products Corp., July 26, 1984.

3. NJDEP Memorandum from Joseph Hoyle to file, Subject: Orbis Products Corp., August 26, 1984.

4. NJDEP Memorandum from Red Rutkowski to file, Subject: Orbis Products Corp., August 28, 1984.

5. Notice of Violation issued by NJDEP, Division of Waste Management, to Orbis Products Corp., Newark, New Jersey, October 9, 1984.

6. Letter from Kenneth Goldstein, P.E., Chief, Industrial Pretreatment Section, Bureau of Industrial Waste Managemnet, to Bill Amaduci, Orbis Products Corp., Newark, New Jersey, June 11, 1986.

7. NJDEP Memorandum from Jeffery Hill to Spill File, Subject: Orbis Products Corp., November 18, 1986.

8. Letter from Lawrence Diamond, Hannoch Weisman Corp., Roseland, New Jersey, to Robert Zoller, New Jersey Department of Environmental Protection, Division of Hazardous Waste Management, West Orange, New Jersey, December 29, 1986.

9. Letter from Frank Coolick, Assistant Director, Hazardous Waste Regulation Element, New Jersey Department of Environmental Protection, to William Amaducci, Manager, Orbis Products Corp., Newark, New Jersey, September 15, 1988.

10. United States Department of the Interior, Geological Survey, State of New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply, Special Report No. 28, Groundwater Resources of Essex County, New Jersey, 1968.

11. Bedrock Topography and Thickness of Pleistocene Deposits in Union County and Adjacent Areas, New Jersey, Bronius Nemickas, U.S. Geological Survey, 1974.

12. Telecon Note: Conversation between Drew Baris, U.S. Environmental Protection Agency, Region 2, Office of Groundwater Management, and Paul Bauer, NUS Corp., June 12, 1989.

13. Telecon Note: Conversation between Drew Baris, U.S. Environmental Protection Agency, Region 2, Office of Groundwater Management, and Edmund Knyfd Jr., NUS Corp., May 15, 1989.

14. Uncontrolled hazardous waste site ranking system, A user's manual, 40 CFR, Part 300, Appendix A, 1986.

15. Telecon Note: Conversation between Ms. James, Newark City Water Department, and John Harrison, NUS Corp., April 17, 1989.

16. Telecon Note: Conversation between Mr. Melito, Engineer, Essex County Department of Public Works, and Richard Pagano, NUS Corp., January 20, 1988.

17. Telecon Note: Conversation between the Engineering Department, Elizabeth Water Company, and John Harrison, NUS Corp., April 19, 1989.

18. Three-Mile Vicinity Map, based on U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 minute series, "Elizabeth, NJ-NY", 1967, photorevised 1981; "Roselle, NJ", 1955, photorevised 1981.

19. Off-Site Reconnaissance Information Reporting Form, Orbis Products Corp.,TDD No. 02-8905-06 , NUS Corporation Region 2 FIT, Edison, New Jersey, May 11, 1989.

## REFERENCES (Cont'd)

20. Telecon Note: Conversation between Mr. Peoples, Newark Water Department, and John Harrison, NUS Corp., May 18, 1989.

21. New Jersey Department of Environmental Protection, Land Use Overlay Sheet 26, Kemble Widmer, State Geologist, 1976.

22. U.S. Department of the Interior, U.S. Fish and Wildlife Service, Atlantic Coast Ecological Inventory, Newark, NJ-NY-PA, 1980.

23. State of New Jersey Department of Environmental Protection, Division of Water Resources, Surface Water Quality Standards, N.J.A.C. 7:9-4, Index D-Surface Water Classifications of the Passaic, Hackensack and N.Y. Harbor Complex Basin, July 1985.

24. General Sciences Corporation, Graphical Exposure Modeling Systems (GEMS). Landover, Maryland, 1986.

25. Analytical Data Report, Project Number P87-304, Elson T. Killam Associates, Inc., September 24, 1987.

26. Proposal to Develop a Comprehensive Waste Transfer Program, James C. Anderson Associates, Inc., Mt. Holly, New Jersey, February 27, 1987.

27. Telecon Note: Conversation between Dave Osterman, Division of Hazardous Waste Management, and Paul Bauer, NUS Corp., June 15, 1989.

28. Notice of Violation issued by New Jersey Department of Environmental Protection, Division of Waste Management, to Orbis Products Corp., Newark, New Jersey, November 20, 1984.

29. Letter from New Jersey Department of Environmental Protection, Division of Hazardous Waste Management, to Bill Amaducci, Manager, Orbis Products, Newark, New Jersey, May 16, 1986.

30. Telecon Note: Conversation between Mr. Tivillyes, Engineer, Newark City Water Department, and Paul Bauer, NUS Corp., June 27, 1989.

REFERENCE NO. 1

EPA

**ACKNOWLEDGEMENT OF NOTIFICATION OF HAZARDOUS WASTE ACTIVITY**
*(VERIFICATION)*

This is to acknowledge that you have filed a Notification of Hazardous Waste Activity for the installation located at the address shown in the box below to comply with Section 3010 of the Resource Conservation and Recovery Act *(RCRA)*. Your EPA Identification Number for that installation appears in the box below. The EPA Identification Number must be included on all shipping manifests for transporting hazardous wastes; on all Annual Reports that generators of hazardous waste, and owners and operators of hazardous waste treatment, storage and disposal facilities must file with EPA; on all applications for a Federal Hazardous Waste Permit; and other hazardous waste management reports and documents required under Subtitle C of RCRA.

EPA I.D. NUMBER ➤ NJD010910099

ORBIS PRODUCTS CORP
55 VIRGINIA ST
NEWARK, NJ 07114

INSTALLATION ADDRESS ➤ 55 VIRGINIA ST
NEWARK, NJ 07114

EPA Form 8700-12B (4-80)

10/09/80

Please print or type with ELITE type *(12 characters/inch)* in the unshaded areas only.

*Form Approved OMB No. 158-S79016*
*GSA No. 0246-EPA-OT*

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

# NOTIFICATION OF HAZARDOUS WASTE ACTIVITY

**INSTRUCTIONS:** If you received a preprinted label, affix it in the space at left. If any of the information on the label is incorrect, draw a line through it and supply the correct information in the appropriate section below. If the label is complete and correct, leave Items I, II, and III below blank. If you did not receive a preprinted label, complete all items. "Installation" means a single site where hazardous waste is generated, treated, stored and/or disposed of, or a transporter's principal place of business. Please refer to the INSTRUCTIONS FOR FILING NOTIFICATION before completing this form. The information requested herein is required by law *(Section 3010 of the Resource Conservation and Recovery Act).*

| | |
|---|---|
| INSTALLATION'S EPA I.D. NO. | |
| I. NAME OF INSTALLATION | NJD010910099 |
| II. INSTALLATION MAILING ADDRESS | ORBIS PRODUCTS CORP<br>55 VIRGINIA ST<br>NEWARK, NJ 07114 |
| III. LOCATION OF INSTALLATION | 55 VIRGINIA ST<br>NEWARK, NJ 07114 |

DETACH

## FOR OFFICIAL USE ONLY

COMMENTS: C

| INSTALLATION'S EPA I.D. NUMBER | APPROVED | DATE RECEIVED (yr., mo., & day) |
|---|---|---|
| F NJDC109099 3 1 | | 800814 |

## I. NAME OF INSTALLATION

## II. INSTALLATION MAILING ADDRESS

STREET OR P.O. BOX: 3

CITY OR TOWN: 4 | ST. | ZIP CODE

## III. LOCATION OF INSTALLATION

STREET OR ROUTE NUMBER: 5

CITY OR TOWN: 6 | ST. | ZIP CODE

## IV. INSTALLATION CONTACT

NAME AND TITLE *(last, first, & job title)*: 2 LAUFER ROBERT VP GENERAL MGR

PHONE NO. *(area code & no.)*: 201-887-5600

## V. OWNERSHIP

A. NAME OF INSTALLATION'S LEGAL OWNER: 8 NORDA INC.

DETACH

B. TYPE OF OWNERSHIP *(enter the appropriate letter into box)*

F = FEDERAL
M = NON-FEDERAL

M

## VI. TYPE OF HAZARDOUS WASTE ACTIVITY *(enter "X" in the appropriate box(es))*

- [X] A. GENERATION
- [ ] B. TRANSPORTATION *(complete item VII)*
- [X] C. TREAT/STORE/DISPOSE
- [ ] D. UNDERGROUND INJECTION

## VII. MODE OF TRANSPORTATION *(transporters only – enter "X" in the appropriate box(es))*

- [ ] A. AIR
- [ ] B. RAIL
- [ ] C. HIGHWAY
- [ ] D. WATER
- [ ] E. OTHER *(specify)*:

## VIII. FIRST OR SUBSEQUENT NOTIFICATION

Mark "X" in the appropriate box to indicate whether this is your installation's first notification of hazardous waste activity or a subsequent notification. If this is not your first notification, enter your Installation's EPA I.D. Number in the space provided below.

- [X] A. FIRST NOTIFICATION
- [ ] B. SUBSEQUENT NOTIFICATION *(complete item C)*

C. INSTALLATION'S EPA I.D. NO.

## IX. DESCRIPTION OF HAZARDOUS WASTES

Please go to the reverse of this form and provide the requested information.

| I.D. – FOR OFFICIAL USE ONLY | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S | W | N | J | D | 0 | 1 | 0 | 9 | 1 | 0 | 0 | 9 | 9 | T/A C 21 |
| 1 | 2 | | | | | | | | | | | | 13 | 14 15 |

## IX. DESCRIPTION OF HAZARDOUS WASTES *(continued from front)*

**A. HAZARDOUS WASTES FROM NON–SPECIFIC SOURCES.** Enter the four–digit number from 40 CFR Part 261.31 for each listed hazardous waste from non–specific sources your installation handles. Use additional sheets if necessary.

| | | | | | |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |

**B. HAZARDOUS WASTES FROM SPECIFIC SOURCES.** Enter the four–digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

| | | | | | |
|---|---|---|---|---|---|
| 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 |

**C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES.** Enter the four–digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

| | | | | | |
|---|---|---|---|---|---|
| 31 | 32 | 33 | 34 | 35 | 36 |
| 37 | 38 | 39 | 40 | 41 | 42 |
| 43 | 44 | 45 | 46 | 47 | 48 |

**D. LISTED INFECTIOUS WASTES.** Enter the four–digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

| | | | | | |
|---|---|---|---|---|---|
| 49 | 50 | 51 | 52 | 53 | 54 |

**E. CHARACTERISTICS OF NON–LISTED HAZARDOUS WASTES.** Mark "X" in the boxes corresponding to the characteristics of non–listed hazardous wastes your installation handles. *(See 40 CFR Parts 261.21 – 261.24.)*

- [ ] 1. IGNITABLE (D001)
- [X] 2. CORROSIVE (D002)
- [ ] 3. REACTIVE (D003)
- [X] 4. TOXIC (D000)

## X. CERTIFICATION

*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

| SIGNATURE | NAME & OFFICIAL TITLE *(type or print)* | DATE SIGNED |
|---|---|---|
| Robert J. Laufer | Robert J. Laufer, V.P./General Mgr. | 8/13/80 |



DETACH A

Form Approved OMB No. 158-S80004

FORM 3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

# HAZARDOUS WASTE PERMIT APPLICATION

*Consolidated Permits Program*

*(This information is required under Section 3005 of RCRA.)*

## I. EPA I.D. NUMBER

S: F N J D 0 1 0 9 1 0 0 9 9 T/A: 3 C: 1

## FOR OFFICIAL USE ONLY

| APPLICATION APPROVED | DATE RECEIVED (yr., mo., & day) | COMMENTS |
|---|---|---|
| | | |

## II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

**A. FIRST APPLICATION** *(place an "X" below and provide the appropriate date)*

X 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

C 8 — YR. 7 6 — MO. 0 8 — DAY 0 1 — FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

☐ 2. NEW FACILITY *(Complete item below.)*

YR. MO. DAY — FOR NEW FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR IS EXPECTED TO BEGIN

**B. REVISED APPLICATION** *(place an "X" below and complete Item I above)*

☐ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

## III. PROCESSES – CODES AND DESIGN CAPACITIES

**A. PROCESS CODE** – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code*(s)* in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C).*

**B. PROCESS DESIGN CAPACITY** – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

| PROCESS | PROCESS CODE | APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY |
|---|---|---|
| **Storage:** | | |
| CONTAINER *(barrel, drum, etc.)* | S01 | GALLONS OR LITERS |
| TANK | S02 | GALLONS OR LITERS |
| WASTE PILE | S03 | CUBIC YARDS OR CUBIC METERS |
| SURFACE IMPOUNDMENT | S04 | GALLONS OR LITERS |
| **Disposal:** | | |
| INJECTION WELL | D79 | GALLONS OR LITERS |
| LANDFILL | D80 | ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER |
| LAND APPLICATION | D81 | ACRES OR HECTARES |
| OCEAN DISPOSAL | D82 | GALLONS PER DAY OR LITERS PER DAY |
| SURFACE IMPOUNDMENT | D83 | GALLONS OR LITERS |

| PROCESS | PROCESS CODE | APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY |
|---|---|---|
| **Treatment:** | | |
| TANK | T01 | GALLONS PER DAY OR LITERS PER DAY |
| SURFACE IMPOUNDMENT | T02 | GALLONS PER DAY OR LITERS PER DAY |
| INCINERATOR | T03 | TONS PER HOUR OR METRIC TONS PER HOUR: GALLONS PER HOUR OR LITERS PER HOUR |
| OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)* | T04 | GALLONS PER DAY OR LITERS PER DAY |

| UNIT OF MEASURE | UNIT OF MEASURE CODE | UNIT OF MEASURE | UNIT OF MEASURE CODE | UNIT OF MEASURE | UNIT OF MEASURE CODE |
|---|---|---|---|---|---|
| GALLONS | G | LITERS PER DAY | V | ACRE-FEET | A |
| LITERS | L | TONS PER HOUR | D | HECTARE-METER | F |
| CUBIC YARDS | Y | METRIC TONS PER HOUR | W | ACRES | B |
| CUBIC METERS | C | GALLONS PER HOUR | E | HECTARES | Q |
| GALLONS PER DAY | U | LITERS PER HOUR | H | | |

**EXAMPLE FOR COMPLETING ITEM III** *(shown in line numbers X-1 and X-2 below):* A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

S: C — DUP — T/A: — C: 1

| LINE NUMBER | A. PROCESS CODE (from list above) | B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify) | B. 2. UNIT OF MEASURE (enter code) | FOR OFFICIAL USE ONLY | LINE NUMBER | A. PROCESS CODE (from list above) | B. PROCESS DESIGN CAPACITY 1. AMOUNT | B. 2. UNIT OF MEASURE (enter code) | FOR OFFICIAL USE ONLY |
|---|---|---|---|---|---|---|---|---|---|
| X-1 | S 0 2 | 600 | G | | 5 | | | | |
| X-2 | T 0 3 | 20 | E | | 6 | | | | |
| 1 | S 0 1 | 5,500 | G | | 7 | | | | |
| 2 | T 0 1 | 500,000 | G | | 8 | | | | |
| 3 | | | | | 9 | | | | |
| 4 | | | | | 10 | | | | |

## III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04") FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

## IV. DESCRIPTION OF HAZARDOUS WASTES

A. **EPA HAZARDOUS WASTE NUMBER** – Enter the four–digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four–digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. **ESTIMATED ANNUAL QUANTITY** – For each **listed waste** entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each **characteristic** or **toxic contaminant** entered in column A estimate the total annual quantity of all the non–listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. **UNIT OF MEASURE** – For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

| ENGLISH UNIT OF MEASURE | CODE | METRIC UNIT OF MEASURE | CODE |
|---|---|---|---|
| POUNDS | P | KILOGRAMS | K |
| TONS | T | METRIC TONS | M |

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. **PROCESSES**

1. PROCESS CODES:
   **For listed hazardous waste:** For each **listed** hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   **For non–listed hazardous wastes:** For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate **all** the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   **Note:** Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

**NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER** – Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

**EXAMPLE FOR COMPLETING ITEM IV** *(shown in line numbers X-1, X-2, X-3, and X-4 below)* – A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non–listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

| LINE NO. | A. EPA HAZARD. WASTE NO. (enter code) | B. ESTIMATED ANNUAL QUANTITY OF WASTE | C. UNIT OF MEASURE (enter code) | D. PROCESSES 1. PROCESS CODES (enter) | D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1)) |
|---|---|---|---|---|---|
| X-1 | K 0 5 4 | 900 | P | T 0 3 D 8 0 | |
| X-2 | D 0 0 2 | 400 | P | T 0 3 D 8 0 | |
| X-3 | D 0 0 1 | 100 | P | T 0 3 D 8 0 | |
| X-4 | D 0 0 2 | | | | included with above |



CONTINUE ON PAGE 3

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

| EPA I.D. NUMBER (enter from page 1) | FOR OFFICIAL USE ONLY |
|---|---|
| W N J D 0 1 0 9 1 0 0 9 9 — 1 | W DUP — 2 DUP |

## IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

| LINE NO. | A. EPA HAZARD. WASTE NO. (enter code) | B. ESTIMATED ANNUAL QUANTITY OF WASTE | C. UNIT OF MEASURE (enter code) | D. PROCESSES 1. PROCESS CODES (enter) | D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1)) |
|---|---|---|---|---|---|
| 1 | D002 | 775,625 | T | T01 | |
| 2 | D009 | | | | included with above |
| 3 | D001 | 45,000 | P | S01 | |
| 4 | | | | | |
| 5 | | | | | |
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| 26 | | | | | |

EPA Form 3510-3 (6-80)

CONTINUE ON REVERSE

PAGE 3 ____ OF 5

(enter "A", "B", "C", etc. behind the "3" to identify photocopied pages)

## IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

| EPA I.D. NO. (enter from page 1) | |
|---|---|
| F N J 0 0 1 0 9 1 0 0 9 9 | 5 6 |

## V. FACILITY DRAWING

All **existing** facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail).*

## VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail).*

## VII. FACILITY GEOGRAPHIC LOCATION

| LATITUDE (degrees, minutes & seconds) | LONGITUDE (degrees, minutes, & seconds) |
|---|---|
| 40 41 [illegible] | 074 12 [illegible]0 |

## VIII. FACILITY OWNER

X A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

| 1. NAME OF FACILITY'S LEGAL OWNER | 2. PHONE NO. (area code & no.) |
|---|---|
| E | |

| 3. STREET OR P.O. BOX | 4. CITY OR TOWN | 5. ST. | 6. ZIP CODE |
|---|---|---|---|
| F | G | | |

## IX. OWNER CERTIFICATION

*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

| A. NAME (print or type) | B. SIGNATURE | C. DATE SIGNED |
|---|---|---|
| Robert J. Laufer<br>Vice President & General Manager | Robert J Laufer | 11/18/80 |

## X. OPERATOR CERTIFICATION

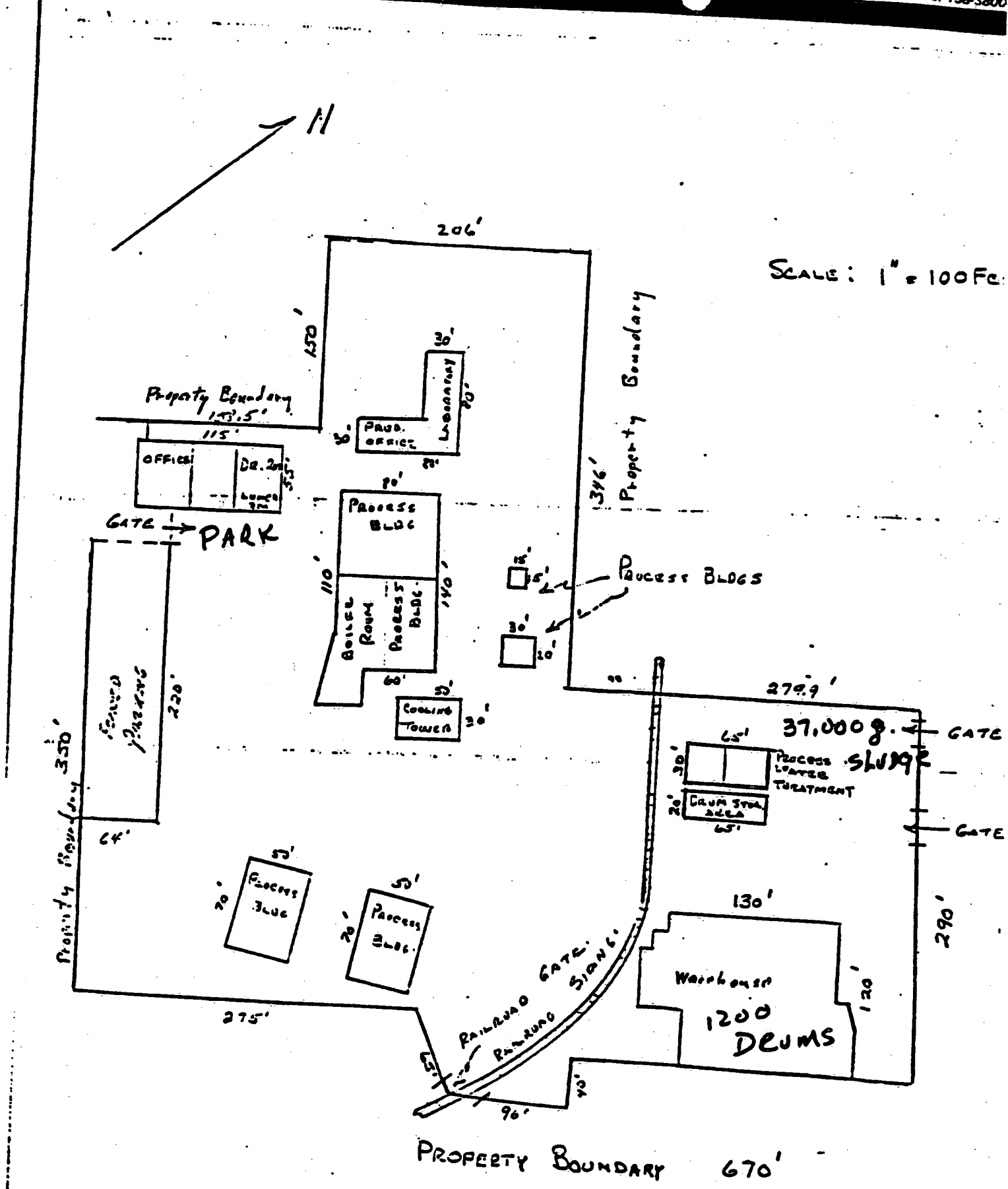
*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

| A. NAME (print or type) | B. SIGNATURE | C. DATE SIGNED |
|---|---|---|
| | | |



CONTINUE ON PAGE 5

Form Approved OMB No. 158-S800




8/20/84
SITE CONDITIONS

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

# GENERAL INFORMATION

*Consolidated Permits Program*

*(Read the "General Instructions" before starting.)*

**I. EPA I.D. NUMBER**

| S | | | | | | | | | | | | | T/A | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | N | J | D | 0 | 1 | 0 | 9 | 1 | 0 | 0 | 9 | 9 | 3 | D |

1 2 - 13 14 15

**LABEL ITEMS**

| | |
|---|---|
| I. EPA I.D. NUMBER | NJD010910099 |
| III. FACILITY NAME | ORBIS ~~PRODUCTS~~ CORP |
| V. FACILITY MAILING ADDRESS | ~~SE VIRGINIA ST~~<br>~~NEWARK NJ 07114~~ |
| VI. FACILITY LOCATION | 55 ~~VIRGINIA~~ ST<br>NEWARK NJ 07114 |

**GENERAL INSTRUCTIONS**

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area*(s)* below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

## II. POLLUTANT CHARACTERISTICS

**INSTRUCTIONS:** Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms**.

| SPECIFIC QUESTIONS | MARK 'X' YES | NO | FORM ATTACHED | SPECIFIC QUESTIONS | MARK 'X' YES | NO | FORM ATTACHED |
|---|---|---|---|---|---|---|---|
| A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A) | | X | | B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge to waters of the U.S.**? (FORM 2B) | | X | |
| | 16 | 17 | 18 | | 19 | 20 | 21 |
| C. Is this a facility which currently results in **discharges to waters of the U.S.** other than those described in A or B above? (FORM 2C) | | X | | D. Is this a proposed facility *(other than those described in A or B above)* which will result in a **discharge to waters of the U.S.**? (FORM 2D) | - | X | |
| | 22 | 23 | 24 | | 25 | 26 | 27 |
| E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3) | X | | | F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4) | | X | |
| | 28 | 29 | 30 | | 31 | 32 | 33 |
| G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4) | | X | | H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4) | | X | |
| | 34 | 35 | 36 | | 37 | 38 | 39 |
| I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5) | | X | | J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area**? (FORM 5) | | X | |
| | 40 | 41 | 42 | | 43 | 44 | 45 |

## III. NAME OF FACILITY

C 1 SKIP ORBIS PRODUCTS CORPORATION

15 16 - 29 30 69

## IV. FACILITY CONTACT

| A. NAME & TITLE *(last, first, & title)* | B. PHONE *(area code & no.)* | | |
|---|---|---|---|
| C 2 KUCHENMEISTER CLIFFORD MANAGER | 201 | 824 | 3144 |
| 15 16 - 45 | 46 - 48 | 49 - 51 | 52 - 55 |

## V. FACILITY MAILING ADDRESS

**A. STREET OR P.O. BOX**

C 3 140 ROUTE 10

15 16 - 45

| B. CITY OR TOWN | C. STATE | D. ZIP CODE |
|---|---|---|
| C 4 EAST HANOVER | NJ | 07936 |
| 15 16 - 40 | 41 - 42 | 47 - 51 |

## VI. FACILITY LOCATION

**A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER**

C 5 55 VIRGINIA STREET

15 16 - 45

**B. COUNTY NAME**

ESSEX

46 - 70

| C. CITY OR TOWN | D. STATE | E. ZIP CODE | F. COUNTY CODE *(if known)* |
|---|---|---|---|
| C 6 NEWARK | NJ | 07114 | |
| 15 16 - 40 | 41 - 42 | 47 - 51 | 52 - 54 |

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

| A. FIRST | | B. SECOND | |
|---|---|---|---|
| 2869 | (specify) Industrial Organic Chemicals,n.e.c. | 2899 | (specify) Chemicals & Chemical Preparations,n.e.c |
| C. THIRD | | D. FOURTH | |
| | (specify) | | (specify) |

VIII. OPERATOR INFORMATION

A. NAME

ORBIS PRODUCTS CORPORATION

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

M - PUBLIC (other than federal or state)
O - OTHER (specify)

P (specify)

201 887 5600

E. STREET OR P.O. BOX

140 ROUTE 10

F. CITY OR TOWN

EAST HANOVER

NJ 07936

X. EXISTING ENVIRONMENTAL PERMITS

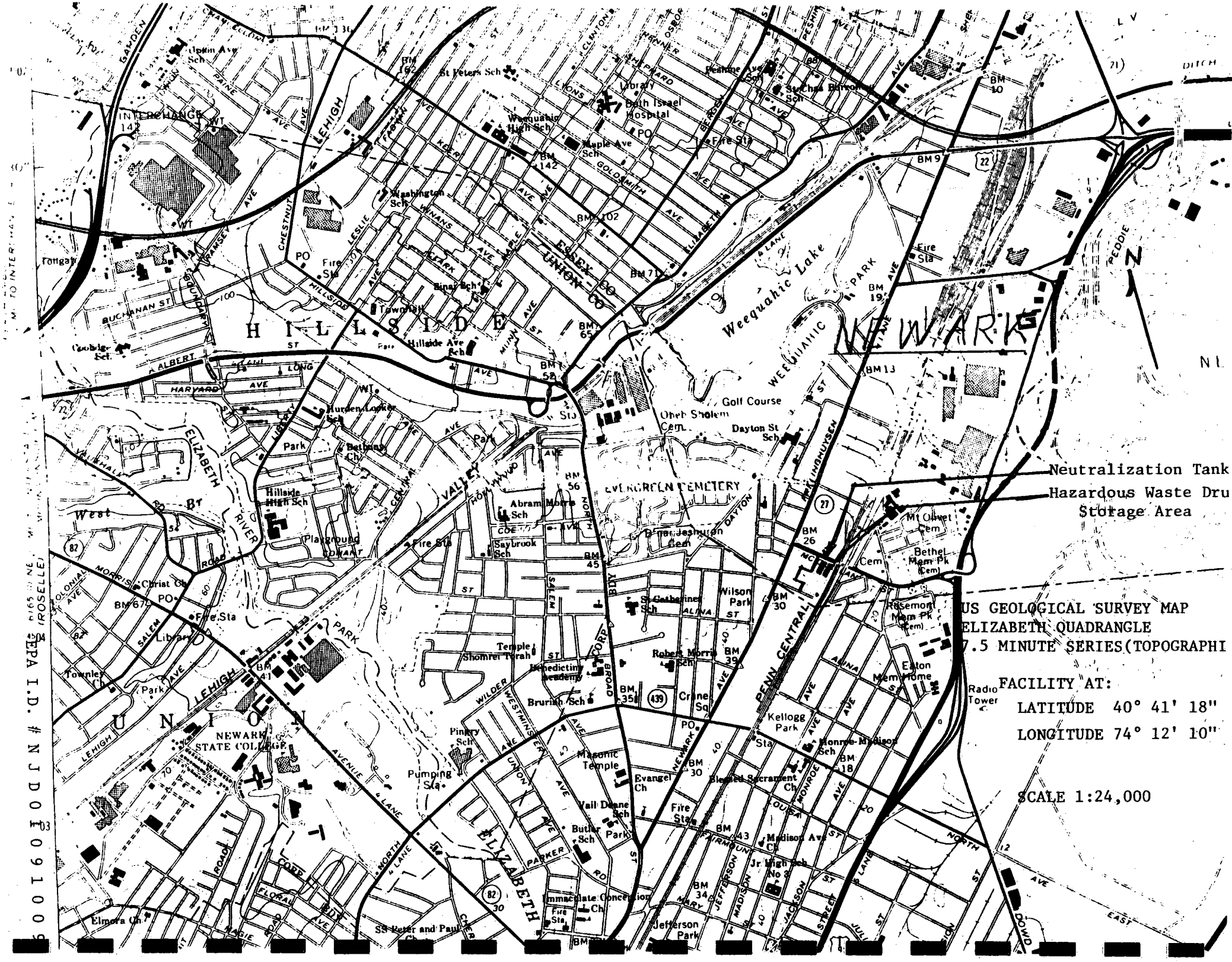
| | | |
|---|---|---|
| | | |
| | NEW JERSEY | (specify) See attached list |
| | C-7507 | (specify) NJDEP AIR |

XI. NATURE OF BUSINESS (Provide a brief description)

Basic manufacturer of aroma chemicals used by producers of flavors and fragrances; also basic manufacturer of fine organic chemical intermediates used by pharmaceutical producers and other industries.

F9: A/51

| A. NAME & OFFICIAL TITLE (type or print) | B. SIGNATURE | C. DATE SIGNED |
|---|---|---|
| Robert J. Laufer<br>Vice President & General Manager | Robert J. Laufer | 11/18/80 |


Neutralization Tank
Hazardous Waste Dru
Storage Area
US GEOLOGICAL SURVEY MAP
ELIZABETH QUADRANGLE
7.5 MINUTE SERIES(TOPOGRAPHI
FACILITY AT:
LATITUDE 40° 41' 18"
LONGITUDE 74° 12' 10"
SCALE 1:24,000
EPA I.D. # NJD0109100
HILLSIDE
NEWARK
UNION
ELIZABETH
Weequahic Lake
EVERGREEN CEMETERY
NEWARK STATE COLLEGE
Golf Course
Hillside High Sch
Weequahic High Sch
Washington Sch
Abram Morris Sch
Saybrook Sch
Wilson Park
Kellogg Park
Jefferson Park
Radio Tower
Mt Olivet Cem
Bethel Mem Pk (Cem)
Rosemont Mem Pk (Cem)
Eaton Mem Home
Masonic Temple
Temple Shomrei Torah
Benedictine Academy
Brurian Sch
Pingry Sch
Pumping Sta
Immaculate Conception Ch
Elmora Ch
Townley Ch
Christ Ch
Library
Playground
Fire Sta
Townhall
Golf Course
Oheb Sholem Cem
Dayton St Sch
Madison Ave Ch
Jr High Sch No 3
Blessed Sacrament Ch
Evangel Ch
Vail Deane Sch
Butler Sch
Crane Sq
Robert Morris Sch
St Catherines Sch
Monroe-Madison Sch
Bath Israel Hospital
Maple Ave Sch
Upton Ave Sch
St Peters Sch
Coolidge Sch
Hurden Looker Sch
Bethany Ch
Sinai Sch
Elizabeth River
Passaic River
Penn Central
Essex Co
Union Co
Lehigh
Interchange 142
Tollgate
Buchanan St
Harvard Ave
Chestnut
Elizabeth Ave
Morris Ave
Salem
Westminster Ave
Broad
Newark
Jefferson
Madison
Jackson
Dayton
Hillside Ave
Avenue
Parker Rd
Corp Bdy
Peddie
Dowd
Nl

REFERENCE NO. 2

Form ADM-012

# MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO File DATE July 26, 1984

FROM Joseph Hoyle

SUBJECT Orbis Products Corporation

June 26, 1984

On this date I made an initial site inspection, along with Robert J. Friedman from the Essex County Health Department of Orbis Products Corp., 55 Virginia Avenue, Newark. The reason for this inspection is a followup of a previous inspection done by Andrew S. Barais. During Mr. Barais' inspection it was indicated that a hazardous situation existed. This is also to substantiate the findings.

The site in question sits on a tract of land, .8282 acres, lot 15, block 37.73. Also lots 41 - 45, 47 - 63 McClellen Street, 980 - 990 Frelinghysen 1.3140 acres. The plant itself has been at this location for over 40 years. Bordering the facility is McClellen Street, Frelinghysen Avenue, Virginia Street and the Amtrack/Conrail lines. The Orbis plant is a subsidiary of Norda Corporation. Orbis Products Corp. has been operating with a skeleton crew since July, 1983, under the auspices of expanding at a later date. The plant manufactures products used in the cosmetic agriculture, medical industries. It incorporates chemicals that are extremely hazardous to both the environment and to employees. The process in which products are manufactured, uses glass lined vessels, glass tubing, and most of all stainless steel fittings.

I, the writer and Robert Friedman, met with Mr. William Amaducci, Plant Manager, and also with Mr. Albert Devigile, Plant Superintendent, about why we were there. During the conversations it became apparent that both Amaducci and Devigile were uneasy. (Note: Prior to making inspection, an appointment had been set up). I indicated that on the previous inspection several items of interest needed to be addressed and that if in fact these items had been complied with. After a few moments to contemplate on what was expected, an inspection party consisting of Robert Friedman, Joseph Hoyle, William Amaducci, Albert Devigile, proceeded toward the main complex. Upon reaching the outer door way of the office we made contact with Mr. Max Williamson, Plant Foreman. Mr. Williamson along with Devigile have been with the Orbis Company for over three decades. Mr. Williamson is the union shop steward. In speaking with both men, Mr. Friedman advised them of the serious nature of not being safety conscious when working with hazardous materials.

As the inspection entourage left the main office it proceeded to the rear of the site. There is a fence that separates Orbis from a junk yard. In this particular area it is evident that soil contamination exists. This contamination coming in the form as rain run off, but a closer evaluation show that this was in fact oil leaching from the junk yard. I spoke to Mr. Amaducci about it, and he indicated "what can I do". In this particular area, holding tanks (aboveground) showed evidence of oil saturated concrete, also the appearance that drums have been in this location for quite some time. When asked about the housekeeping

requirements, I was informed that due to shortage of personnel and other high priority commitments certain areas of the facility were left alone. We then traveled toward the other parts of the facility. Upon entering an open area I asked Mr. Amaducci where did all the water (rain) run off go to and then he indicated that through the storm sewer system which is connected to a 20 thousand gallon holding tank, (partially sunken) also that the plant has a permit with the Passaic Valley Sewage Commission #21401032. I asked Mr. Amaducci did he have any analytical data on the effluent, he said he did, but not at the Newark office. We observed the tank in question. Concrete in construction, no liner on bottom, but Amaducci claimed that a natural clay barrier was at bottom. When looking into this vessel it was noted that a thin film of oil at the surface. When asked, the reply was that this layer was skimmed off and burned in the plant's furnace. What about the sludge at the bottom of the tank, reply "that the sludge has never been removed". Asked did he know that the stuff was hazardous, it was if no concern necessary. We then left this area and made our way toward a warehouse. Before reaching this area, off to the left side of the court yard there are drums stacked and lined. When inquired, indicated that these drums were empty and being staged there for drum reclamation. Drum reclaimers name not furnished at time of inspection. Stenciled on the side of many of the drums were these chemical names:

1 - P-chlorobenzoyl
2 - Sodium hypochloride
3 - Allyl isothiocyanate
4 - Anisic aldehyde
5 - Allyl chloride

Asked if these drums were completely empty when sent to reclaimer, the reply was "yes", but upon inspection it proved that most of drums had the one inch residual liquids in them. I informed Mr. Amaducci that he could be liable for shipping residual hazardous waste illegally and that should two dissimilar materials make contact under adverse conditions it could prove costly not only in material, but also to the human environment. With this the inspection group moved toward the warehouse.

The outward appearance of the warehouse is one of abandonment, broken windows, open doors, and drums of chemicals, permeate the area. Both Robert Friedman and myself entered the warehouse very cautiously, followed by Mr. Amaducci, Devigile and Williamson. Once inside the warehouse, it was apparent that no work had been accomplished since the previous inspection. Leaking drums stacked three high, drums sitting in pools and pools of liquid. The liquid that was observed has a bit of odor to it. Not of a petroleum product but of an acidic compound. First floor - approximately 1200 drums stacked three high, sitting in an hap-hazard way, leaking, corroded bottoms.

Stenciled on drums:

1 - P-chlorobenzoyl
2 - Sodium hypochloride
3 - Allyl isothiocyanate
4 - Anisic aldehyde

There were no other questions to ask, but to indicate to Mr. Amaducci the internal cleanup must begin immediately. I have been informed by Mr. Amaducci that the plant will be shut down for two weeks and will reopen during the week of the 27th of July. I indicated to Mr. Amaducci that it was imperative that steps be taken prior to closure to have the areas in question corrected. "I'll do my best", was the reply. The upper floors of the warehouse, were littered with debris and trash. The extreme lower levels have the same cosmetic appearance as all of the other sections of the building. When asked about the disposition of the building, it was indicated by Mr. Amaducci that the building itself was part of the refurbishing program of the plant and that at present no work was being accomplished.

At this point we left the warehouse type structure and proceeded toward the laboratory/office area. In this region I inquired about the overall working schematic. Mr. Amaducci again made it clear that only chemist/technicians were allowed to handle any of the material there. Robert Friedman noted that a rather large container contained chlorinated phenols (this was on the label), and informed Mr. Amaducci that things of this nature should not be left laying around. Mr. Amaducci indicated that all potentially hazardous materials would be removed and segregated by compatibility. Mr. Friedman at this time asked both Mr. Devigile and Mr. Williamson about the safety aspects of their proposed operation. Both men replied with a positive response that protective clothing would be used.

The inspection group returned back to the main office where a prescheduled date was set for reinspection, tentatively the week of 7/23 to 7/27, this would give the company time to clear up any discrepancies that were noted.

RECOMMENDATIONS:

These are the things that require immediate attention -

1) That all drums regardless of nature will be off ground, and placed on pallets.

2) All contaminated soil be removed and sampled and disposed of in accordance with Hazardous Waste regulations.

Soil contamination is located in area where fence separates, Orbis from junk yard.

Soil contamination in and around aboveground tank to the rear of site.

Warehouse:

1) Removal, proper labeling, and disposition of drums and products within the warehouse.

   A) Concerning Safety -

      1) A fire control system to be installed, eg. sprinkler system,

foam, etc.

2) Respirator and pertinent individual safety equipment available.

3) Water control - prevention rain water from entering building.

2) Appropriate drainage system (water) either installed or upgraded. This will eliminate the ponding effect on the floor of the warehouse.

Holding Tank:

1) The oil and water be drained plus what residual sludge that is on bottom be removed, sampled and disposed of properly. This will greatly reduce the habitation of the dipterous insect.

(The skimmed surface of holding pond (tank) should be analyzed for hazardous material). This will help regulate the amount of volatiles released into the environment.

The scheduled time when all of the above recommendations should be complied with is on or before 8/1. Should none of the items be corrected or disregarded a Notice of Violation will be issued.

FOC20:dg

REFERENCE NO. 3

Form ADM-012

# MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO File DATE 8/27/84

FROM Joseph E. Hoyle JEH

SUBJECT Orbie Products Corp.

On August 20, 1984, I the writer of this report along with Robert Friedmann, Essex County Health Department, and Irwin Rutkowski Engineering Bureau, made our third field inspection to the above mentioned facility. This inspection entails a more indepth synopis of what the final disposition of the facility. So far the plant has been operating in a general atmosphere that has left both the employees and the state in situation of discontent. This is due to economic set-backs that have taken its toll.

August 1, 1984, an inspection was made at Orbis to determine if any corrections have been made since the previous inspection. At this inspection it was evident that some progress toward clean up have taken place. The areas that were to be addressed:

1. Drums sitting on ground.
2. Contaminated soil.
3. Warehouse
4. Holding tanks

As in previous reports these areas needed immediate attention. Here are the findings from that inspection:

Item #1 (A) Drums - 90% of the drums that were sitting on the ground were placed on pallets and rearranged so that there could be no water enhancing chemical activity. The 10% that were not on wooden pallets were either plastic or beyond retainability.

(B) The contaminated soil in question had not been removed but covered over with sand to soak up the oil that has saturated the soil. I questioned Mr. William Amaducci about it and he indicated that when his people at Norda made preparations to drain, sample and dispose of the contents from tank #19A then will the contaminated soil be removed. The contaminated soil near the fence area was cleaned and spread, pallets and other debris were removed and stored properly.

Item #2. Warehouse: The warehouse, (outside) where drums were being stored, was cleaned. This indicated that a positive effort was instituted to aleviate prior

discrepancies. Still inside the warehouse there were no accurate labeling of the drums and most were still three high in some places. No sprinkler system available or were there adequate firefighting apparatii available. This I informed Mr. Amaducci was not acceptable and that should any major incident come out of it, that his company could be and will be charged with:

1. safety code violations
2. fire violations
3. Spill Compensation and Control Act - 28:10-23.11.

This made Mr. Amaducci aware of the extreme seriousness of the situation.

Item #3 -Holding tank - this area had not been addressed, reasoning, that he could not begin until parent company (Norda) has made some arrangements towards sampling and disposal of contents. I indicated to Mr. Amaducci that due to the nature of the inspection an "Notice of Violation" would be issued for:

(1) Storing hazardous waste on site without a permit beyond the 90 day limit.

(2) Disposing of the oil inside of the tank, which in turn is used to burn in the plants furness without permit.

(3) Improper labeling of chemical drums - (ref. to item #1) this is not only unsafe practice but also a hazardous one as well. Mr. Amaducci informed me that the proper labeling process would begin as soon as possible. I indicated to Mr. Amaducci that this should have been taken care of after the previous inspection. And that in effect is a direct violation of OSHA regulations and 29CFR part 1501, 1502, 1503 liable to penalties. This proved very advantageous, in that both state and company were aware of descrepancies. During the inspection dated 20 Aug. 84 the following was noted:

The area where holding tank #19A is located a submerable pump. This pump is saturated with a very heavy oil type substance. The contents of the tank as per information received from Amaducci is "spent solvents". This I am told is to be pumped out and removed by 8/24.

The laboratory area where the following chemicals were found:

cyclotenate - 26646 (7-19-83/9-8-83)
allyl isotheocyanate (4 each)
isobutyric acid
nitric acid
toluol
sodium hydroxide waste
thymol crystals
throxyls chloride
methy pentadiene
chlorinated phenols
aubepine

These chemicals were scattered about in the laboratory. All were in glass bottles, with screw caps and cork plugs. I asked Mr. Amaducci about when will these things be "packed" up and was informed that CECOS, and Norda Chemist were supposed to set a date of 8/24 to have these things manifested, lab packed and shipped. There is also another lab pack partially filled mainly with salts but when I inquired about what the actual contents were and where would I get a copy of the inventory listing the reply that was recieved, is that the inventory sheet is at the main office in Boonton, N.J., and this office would be forwarded the sheet as the analytical data concerning the manifests. Outside the laboratory toward the McClellon side of the site is a 20,000 gallon storage tank, this tank contains sodium hydroxide solution. The approximate volumn is unknown. I asked Amaducci about the disposition and he indicated that the contents had been sold, but he didn't have the buyers name or number. I understand that the removal of the contents should take place 8/24.

Both Mr. Rutkowski, Mr. Friedmann and myself informed Mr. Amaducci that should these violations go uncorrected very heavy penalties could be levied against his company. I also inquired as to the total disposition of the site and again I was informed that he still has no idea as to the disposition.

After reviewing what was found and the process of remedy, this inspection party left the site.

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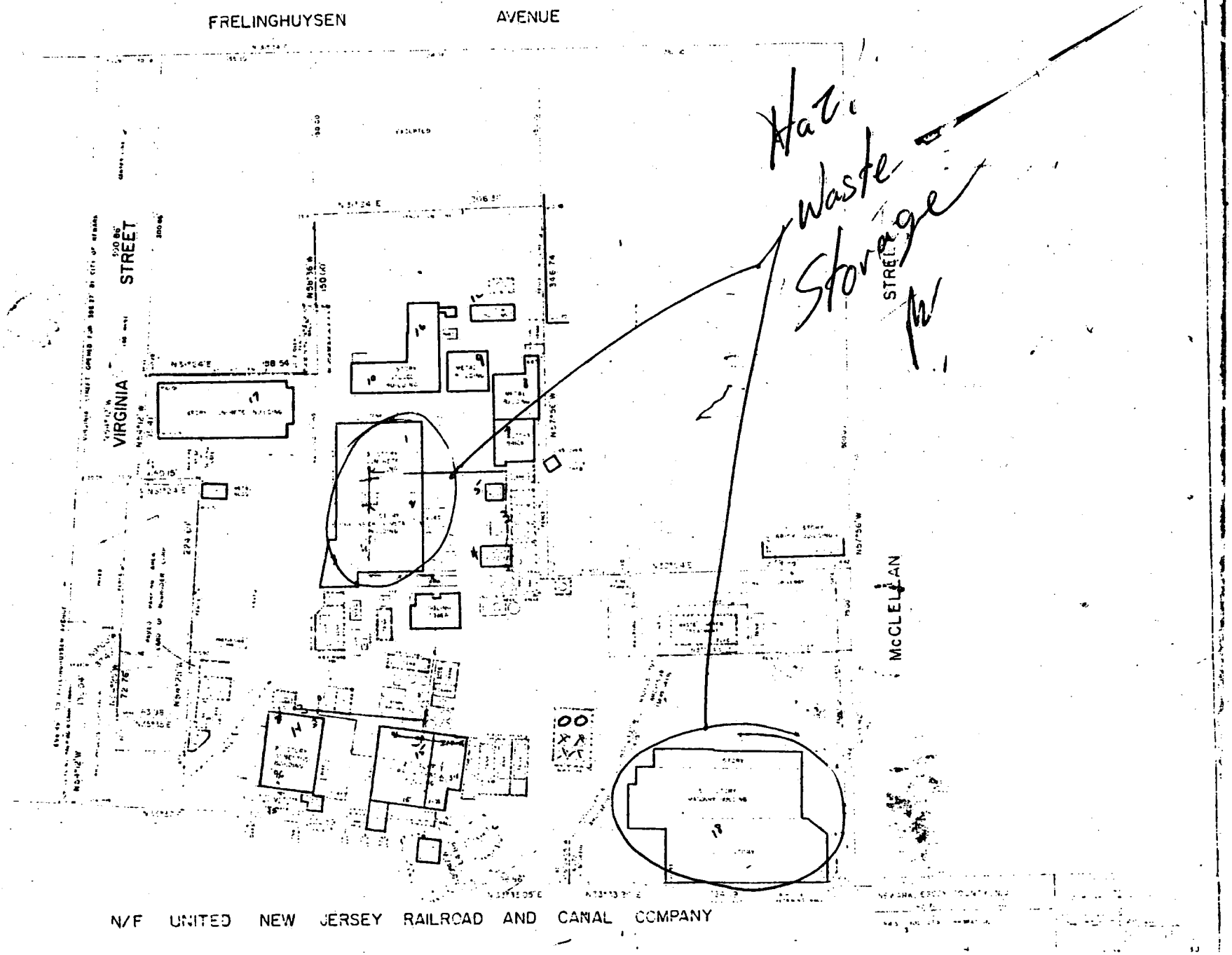

FRELINGHUYSEN AVENUE
VIRGINIA STREET
McCLELLAN STREET
N/F UNITED NEW JERSEY RAILROAD AND CANAL COMPANY
Haz. Waste Storage

REFERENCE NO. 4

ADM-012

# MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO File

FROM Red Rutkowski RR DATE 8/28/84

SUBJECT ORBIS Products Corp. Subsidiary of Norda Inc. Newark, NJ, EPA ID NO. NJD 010 910 099

On Monday, August 20, 1984, from 1000 to 1330 hrs., a site visit and inspection was conducted at the above referenced facility. The following named persons were involved:

Bill Amaducci - Manager, ORBIS Products
Al Devagelli - Prod. Supv., ORBIS Products
Bob Friedman - Ind. Hygienist, Essex Co. Dept. of Health
Joe Hoyle - DWM, BFO, CFO
Red Rutkowski - DWM, BHWE

A RCRA inspection was completed by BFO and a site inspection taking approximately two (2) hours was conducted.

Background:

Orbis Products Corp., Newark, is a subsidiary of Norda, Inc. Norda has facilities in Boonton and East Hanover, NJ. All three facilities are listed as being involved in Aromatic Chemicals, Pharmaceuticals, organic intermediates, fragrances and flavors.

At the time of the 8/20/84 visit, the Newark facility was staffed by four people and it was reported that operations had ceased in late 1983 due to foreign competition. It was also reported that Norda had similar operations in Mexico City.

The current activity was described as selling off existing inventory, limited blending of inventory items, and the cleaning up of the site. It was stressed by Orbis that the cleanup was not to be construed as a closure as the facility was reported as capable of resuming operation either by Orbis or a new owner.

The facility has been listed by the NJDEP as a TSDF (category 3) and is shown in the RCRA-HWDMS read out as a generator only. The design capacities are listed in the 11/19/80 Part A notification as T01 (tank treatment) of 500,000 gallons per day and S01 (container storage) of 5,500 gallons.

BHWE files reveal that the facility requested delisting in a June 16, 1981 letter to EPA on the basis of (a) operating a simple waste water neutralization tank exiting to a POTW (Passaic Valley Authority) and (b) the ninety (90) day drum storage exemption. No record of a reply can be found.

Additionally, reported on 8/20/84 was that when the plant was operating, the oils separated (skimmed) during the waste water treatment were stored and fed as supplemental fuel to the plant's three boilers.

As an added point, Orbis indicated a total tank capacity at the site of approximately 400,000 gallons.

Prior involvement from Field Operations and the Newark Health Department began apparently when a neighborhood complaint was received relative to an accumulation of drums in a warehouse on the edge of the site (5/24/84 odor complaint response from Newark Health Dept.).

Site Discussion:

Prior to the site tour and inspection, a meeting and paperwork review was conducted. It appeared that many of the records associated with the plant operation had been transferred to the Norda operations. Preparedness and prevention, contingency plans, and emergency procedures, and personnel training documents were not available.

Several manifests were reviewed by BFO. These did not appear to be a complete manifest file. The facility requested blank manifests and thirty-five (35) were mailed by the writer on 8/21/84 with instructions and listed contacts in the manifest section for future activity.

The facility was questioned as to the future status of the site and the Orbis personnel indicated they were uncertain and stated that a decision was to be made at a management meeting scheduled for August 21, 1984. The options indicated were that the operation would either close, remain open and again commence operation, or be purchased by another owner who would probably commence operations as previously performed. No immediate potential buyer was mentioned.

Orbis maintained that the cleanup operation was not a closure mechanism and contended that most of the residual wastes were not hazardous. Orbis was advised that the contention must be substantiated by analysis and classification procedures and that all wastes would be considered hazardous until nonhazardous verification was provided by Orbis. On 8/20/84, the writer mailed a list of State certified laboratories to Orbis to select for use in the analytical process.

As closely as could be ascertained, the primary wastes generated are the still bottoms from batch processes. These wastes are viscous, dark colored and tend to gelatinize upon standing. They were reported as containing various aldehydes and manganese salts.

Site Inspection:

The entire facility was inoperative including the three boilers. These are blue seal operated units, two of which were estimated at 25,000,000 BTU per hour capacity. The various process areas were visited and there was evident a fair degree of dismantlement. Piping and equipment appurtenances were on skids and pallets. Orbis reported that some equipment had been sold. The general housekeeping appearance was considered as average with evidence of tidying the various areas by stacking in orderly rows the various blend tanks, containers and bins.

There were three tanks cited as being involved in the storage of waste fuels approximately 10,000 gallons each. These were concrete diked to about four foot height.

Several areas were noted with drums stored neatly on their sides and appearing empty (metal drums and large plastic carboys).

Two main areas of concern were as follows:

The waste water treatment unit consisted of a ground level concrete structure about 8 feet deep, 20' x 40' with sectionalized covers which could be moved easily. It consisted of two sections with the first used as a skimmer and the second having central agitation. This unit fed to the sewer line outfall. It was reported by Orbis that the unit consisted of a pH control operation. The waste stream is acidic in nature and sodium hydroxide solution is metered to the unit to neutralize same. The facility reported the generation of very small quantities of sludge.

At the time of the site visit, the unit was not operating and it appeared that it had not been in operation for some time. It was filled to a depth of approximately six (6) feet with a brown colored sludge. The composition of the sludge was not available from Orbis records. The estimated quantity was 37,000 gallons. Orbis was advised to classify and dispose of the sludge and a notice of violation was issued to that effect.

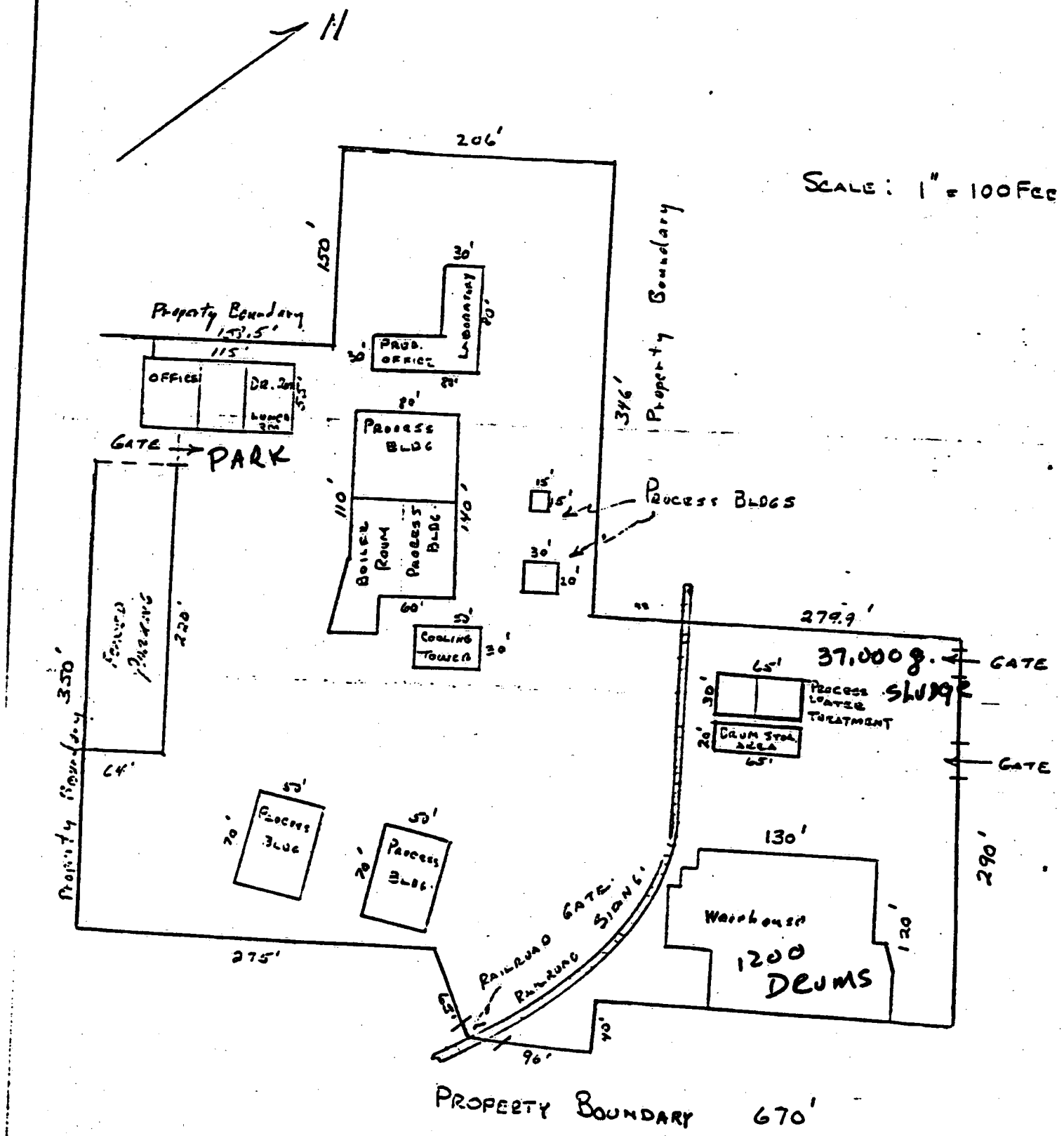
The second area of concern consisted of the warehouse in which were stored approximately 1,200 drums of the previously described still bottom residues. The warehouse had been badly vandalized (all windows broken) and the drums were exposed to the elements and overhead leaks. They were stored three high on palets with little or no identification with no regard for aisle space to identify drums in the center of the storage area. Several areas of leaking drums were found and brought to Orbis' attention. As a portion of this area, Orbis had begun to use over pack drums apparently to contain the leakers. These also did not exhibit identification of contents. Two notices of violation were issued. The first to provide identification plus aisle space and the second to provide preparedness and prevention to minimize the possibility of fire or unplanned releases of hazardous waste to air, soil, and surface waters.

The laboratory section was viewed and there was evidence of lab packs being prepared in fibre drums for disposal of these items. The labs had been stripped of equipment and appeared about 95% closed with only lab chemicals being packed (2-3 drums).

Additionally observed was a 6,500 gallon tank wagon being loaded with waste fuel oil previously described in this memo. The facility reported that this would be manifested to an approved disposal site.

There was not too much evidence of bulk (tank storage) of product or raw materials. One area, next to the powerhouse contained drum raw materials, intermediates, and product which appeared properly labeled.

Form Approved OMB No. 158-S8000




8/20/84
SITE CONDITIONS

REFERENCE NO. 5

Form DWM-002 C
2/84

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
~~1259 ROUTE 46~~
~~PARSIPPANY, N.J. 07054~~
120 Rt 126 YARDVILLE

# NOTICE OF VIOLATION

ID NO. _____ DATE Oct 9, 1984

NAME OF FACILITY Orbis Products

LOCATION OF FACILITY 55 Virginia Ave Newark

NAME OF OPERATOR Robert Amaducci

You are hereby NOTIFIED that during my inspection of your facility on the above date, the following violation(s) of the Solid Waste Management Act, (N.J.S.A. 13:1E-1 et seq.) and Regulations (N.J.A.C. 7:26-1 et seq.) promulgated thereunder and/or the Spill Compensation and Control Act, (N.J.S.A. 58:10-23.11 et seq.) and Regulations (N.J.A.C. 7:1E-1 et seq.) promulgated thereunder were observed. These violation(s) have been recorded as part of the permanent enforcement history of your facility.

DESCRIPTION OF VIOLATION 7:26-9.3b- An Accumulation of 44 Hazardous Waste Drums more than 90 Days - Drums Labeled - Waste Combustible Nos - #127 (X910 - X726) Date on Drums (Start Date Accumulation 1980) (As per Instructions Waste Conversion)

Remedial action to correct these violations must be initiated immediately and be completed by Oct 24, 1984. Within fifteen (15) days of receipt of this Notice of Violation, you shall submit in writing, to the investigator issuing this notice at the above address, the corrective measures you have taken to attain compliance. The issuance of this document serves as notice to you that a violation has occurred and does not preclude the State of New Jersey, or any of its agencies from initiating further administrative or legal action, or from assessing penalties, with respect to this or other violations. Violations of these regulations are punishable by penalties of $25,000 per violation.

Joseph E Hagley (EC02175)
Investigator, Division of Waste Management
Department of Environmental Protection

REFERENCE NO. 6

F. Codair

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
CN 029
TRENTON, NEW JERSEY 08625

George G. McCann, P.E.
Acting Director

Water Quality Management

DIRK C. HOFMAN, P.E.
DEPUTY DIRECTOR

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Bill Amaduci
Orbis Products Co.
55 Virginia Street
Newark, N.J. 07114

RE: Determination of Non RCRA/IWMF Status
EPA ID No. NJD 010 910 099

JUN 11 1986

Dear Mr. Amaduci:

This is in response to a memo to Mr. Paul Kurisko, Chief of the Bureau of Industrial Waste Management, received on December 11, 1985, from the Bureau of Hazardous Waste Engineering, concerning the classification of Orbis Products Co. as an Industrial Waste Management Facility (IWMF).

The "wastewater treatment unit", for which your company filed a RCRA Part A application as a treatment facility, has been determined to be under the scope of the New Jersey Water Pollution Control Act, N.J.S.A. 58:10A-1.1 et seq. The company is subject to the Industrial Waste Management Facility (IWMF) requirements of Subchapter 4 of the New Jersey Pollutant Discharge Elimination System (NJPDES) Regulations, N.J.A.C. 7:14A-1.1 et seq. Enclosed is an IWMF worksheet which shows the basis of our determination.

This action does not relieve Orbis Products Co. of the responsibility for complying with the hazardous waste generation and accumulation requirements of the New Jersey Hazardous Waste Regulations, N.J.A.C. 7:26-1 et seq. Hazardous waste sludges generated from the unit may accumulate on-site for 90 days or less provided that:

(1) All such waste is, within 90 days or less, shipped off-site to an authorized facility;

(2) The waste is placed in containers which meet the standards of N.J.A.C. 7:26-7.2 and are managed in accordance with N.J.A.C. 7:26-9.4(d);

(3) The date upon which each period of accumulation begins is clearly marked and visible for inspection on each container;

(4) The facility complies with the requirements for owners and operators of N.J.A.C. 7:26-9.6 and 9.7 concerning preparedness and prevention, contingency plans, emergency procedures, and personnel training as per N.J.A.C. 7:26-9.4(g).

Any accumulation of such sludges for any period longer than 90 days would constitute a hazardous waste TSD storage facility, and would be subject to regulation under N.J.A.C. 7:26-1 et seq.

Since your facility has been determined to be an IWMF, pursuant to N.J.A.C. 7:14A-10.5(a)(1)(ii), your facility is considered to be a Significant Indirect User (SIU) requiring an individual NJPDES/SIU permit for your discharge to the sanitary sewer. Enclosed please find the application forms that should be completed in accordance with the guidance material within 90 days of receipt of this letter. If you have any questions on the SIU requirements or desire a pre-application conference, please contact Mr. Muhammad Shaikh at (609) 292-4860.

If there are any questions concerning this letter, please contact Valentin Kouame of my staff at (609) 292-4860.

Sincerely,

Kenneth Goldstein

Kenneth Goldstein, P.E., Chief
Industrial Pretreatment Section
Bureau of Industrial Waste Management

WQM216:vk

Enclosures

cc: Frank Coolick - DWM
Shirlee Schiffman - DWM
Joel Golumbek - EPA

# INDUSTRIAL WASTE MANAGEMENT FACILITY (IWMF) WORKSHEET

1. Name: ORBIS PRODUCTS CO.
   Mailing Address: 55 VIRGINIA STREET, NEWARK, NEW JERSEY 07114
   Location Address: 55 VIRGINIA STREET NEWARK, NEW JERSEY 07114
   Facility Contact: BILL AMADUCI
   Telephone No.: (201) 824-3144 RCRA ID No.: NJD 010910099
   Facility NJPDES No.: _____ Type: ___ DSW ___ DGW ___ SIU X None
   Receiving POTW, if any: PVSC POTW NJPDES No. NJ0021016

2. Description of Waste Source(s): GENERATING FROM PHARMACEUTICALS FRAGRANCES, FLAVORS AND AROMATIC COMPOUNDS MANUFACTURING

3. The Waste Source is:

   X Intracompany/Intrastate ___ Intercompany/Intrastate

4. Operational Units comprising the treatment works (describe):

   Unit #1: FIRST STEEL TANK: FEED COLLECTION
   Unit #2: SECOND STEEL TANK: PHASE SEPARATION OF ORGANIC MIXTURES
   Unit #3: FIRST CONCRETE TANK: NEUTRALIZATION
   Unit #4: SECOND CONCRETE TANK: " " "
   Unit #5:
   Unit #6:
   Unit #7:
   Unit #8:

5. Criteria (For each item indicate Yes, No, N/A, etc.):

   a. Is there an influent wastewater? YES
      Is it hazardous? YES
      If yes, list waste type. D001

   b. Does the treatment works generate (G), store (S), or treat (T) a wastewater treatment sludge or residue? YES
      If yes, which units are involved, and what function do they perform? 2(G,S)
      Is it hazardous? YES
      If yes, list waste type(s): D001

   c. Is the unit a "tank" as per NJAC 7:14A-4.3? YES

6. Conclusions: Is the facility an IWMF? YES

7. Comments: THE FACILITY IS NOT A HAZARDOUS WASTE FACILITY (HWF) because it will STORE CONTAINERIZED HAZARDOUS WASTE FOR 90 DAYS OR LESS.

REFERENCE NO. 7

7-14-132

**MEMO**

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Spill file

FROM Jeffrey Hill JH. DATE November 18, 1986

SUBJECT Orbis, 55 Virginia St., Newark - Response to DWM 86-11-17-1M ~~and Pre RCRA inspection~~

Background:

On November 17, 1986 I received an anonymous complaint about a warehouse in Newark that was being used to store drums on McCellan Avenue in Newark. The complainant stated that chemical odors were emanating from the building he described as an old white story warehouse with broken windows. The company whose property it belonged to he identified as Orbis, 55 Virginia Street, Newark.

A file review revealed Orbis as a defunct T.S.D. which also ran a IWMF under a water resources permit. Numerous site visits were performed by Joe Hoyle and Red Rutkowski of this Division. In Mr. Rutkowski's report, he mentioned 1200 drums in old warehouse.

Recent correspondence from our Engineering section to Orbis stated that Orbis had been in violation of NJSA: 7:26-9.3(a) and a.3(b). On August 11, 1986 Orbis was given 10 days to make a response to our department.

At the conclusion of my file review it was questionable of the fate of the hazardous wastes generated at the facility; specifically their process generated still bottoms from large capacity stainless steel tanks.

Inspection:

After noting the buildings presence and faint aromatic vapors from the street, we contacted Mr. Al DiVigli, the plant manager.

Mr. DiVigli stated the plants operation at present only consisted of blending non-hazardous flavorings for the food industry. A visit of their laboratory and raw products confirmed that statement.

The fragrance operation he continued ceased in 1983 of which site remediation had been performed. This remediation included:

1) Removal of six underground tanks that contained hazardous substances. He identified them as Hexane, Isopropyl Alcohol, Methanol and Toluol. A visual inspection revealed holes in three of these tanks. Mr. DiVigli could not identify which tank held which substance.

2) Two 25,000 gallon above ground tanks which contained hazardous wastes (solvents) had also been removed.

3) The drums left behind he stated were taken away by Waste Conversions.

During the inspection we found 2 concrete tanks that were described in the file to contain sludges as part of the operation. They still had a large volume of water in them. When the warehouse was approached we asked Mr. DiVigli if we could look inside. He told us that he did not have the key and that there weren't any drums inside.

A large pile of soil and material identified as Kiln dust by DiVigli existed in several adjoining piles along the length of one side of the warehouse. While I was speaking to Mr. DiVigli, Mr. Zollner climbed on top of these piles which are approximately six feet high to determine if any drums existed inside. Mr. DiVigli did not expect us to verify his claim about the warehouse being empty.

After Mr. Zollner peered through the many broken windows he noted the presence of at least one hundred drums. Mr. DiVigli then told us there were 61 drums inside which contained sludge from the bottom of the tanks. He added they had permits for their storage.

Other items of interest noted were the presence of two underground 10,000 gallon fuel oil tanks still in use which are used for the buildings heat.

At the conclusion of inspecting the plant Mr. Zollner asked Mr. DiVigli for any paperwork he had in regard to the hazardous waste operations. He stated that any paperwork would be at their Boonton Operation. Paperwork specifically asked for were manifests and contingency plans.

Mr. Zollner then requested Mr. DiVigli to telephone the facilities owners that he named were Bill and Bob Amaducci to gain additional information. Mr. DiVigli agreed. After Mr. DiVigli informed Bill Amaducci about our presence and inspection at the facility, he appeared disturbed by Amaducci's return statements.

After Mr. Zollner and I left Mr. Zollner told me Mr. Amaducci was agitated by our inquiry about the facility and Mr. Zollner's request they meet as soon as possible. He then told me a meeting was arranged on Friday November twenty first at 0900. This was the date that Mr. Amaducci said he was first available.

Conclusions:

The next day I spoke to Al Navibi with our Bureau of Hazardous Waste Engineering. Mr. Navibi stated he had sent a enforcement request to Karl Delaney in order that the Orbis facility receive our attention. Mr. Navibi visited the site last year when they were still in operation. He is aware of the conditions in the warehouse and familiar with their operation. When I told him we found 3 excavated tanks with holes in them, he stated it was illegal. Orbis never made application nor informed engineering of their removal!

Mr. Navibi also mentioned we should expect minimal cooperation from the Amaducci brothers. He also recommended we maximize all penalties.

REFERENCE NO. 8

HERBERT J. HANNOCH
(1911-1983)

MILTON H. STERN
ALBERT G. BESSER
BERNARD S. BERKOWITZ
JAMES P. DUGAN
RONALD M. STURTZ
CARL G. WEISENFELD
ROBERT J. DEL TUFO
JAMES J. SHRAGER
ASHLEY STEINHART
DEAN A. GAVER
JOSEPH J. FLEISCHMAN
ELLEN B. KULKA
BERNARD J. D'AVELLA, JR
SANDERS M. CHATTMAN
STEVEN C. LEVITT
STEPHEN P. LICHTSTEIN
IRA B. MARCUS
ANTHONY J. MARCHETTA
WILLIAM W. ROBERTSON
TODD M. SAHNER
IRVIN M. FREILICH
ROBERT C. EPSTEIN
THEODORE MARGOLIS
CARLETON RICHARD KEMPH
LAWRENCE T. NEHER
ARLENE ELGART MIRSKY
GENE R. KORF
JONATHAN M. GROSS
SHELDON M. FINKELSTEIN

OF COUNSEL
JOSEPH A. WEISMAN
SAMUEL M. KINNEY, JR.
WILLIAM J. HELLER
CARMINE A. IANNACCONE

# HANNOCH WEISMAN

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COUNSELLORS AT LAW
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RICHARD J. CONWAY, JR
KEVIN M. KILCULLEN
ROBERT P. ZOLLER
PHILIP J. LEVINE
JOHN MELICHAREK, JR
MICHAEL L. ROSENBERG
HOWARD A. GUTMAN
ANDREW J. STAMELMAN
ANTHONY J. SYLVESTER
A. PATRICK NUCCIARONE
KEVIN J. BRUNO
DAVID N. NARCISO
JANET L. RAMUSACK
NANCY LEM
FRANKLIN K. WYMAN
MIRIAM E. CAHN
MARK MATTIA
JACK GILLMAN
MARY ELLEN SCHEUER
THOMAS L. WEISENBECK
DAVID OWEN
PETER B. BENNETT
KEVIN F. MURPHY
LEONARD A. DAVID
RICHARD M. SLOTKIN
PATRICK E. HOBBS
MICHAEL G. KEATING
JOHN M. SIMON
JEFFREY B. LEHRER
DAVID C. BERMAN
JEFFREY W. POMPEO
MICHAEL KURAK
NANCY B. ROHN
MARY ANN WALKER COLLINS
BRIAN ARRINGTON BOYD*
GERALYN G. HUMPHREY
LAWRENCE W. DIAMOND**
AMY R. WEISSBROD***
DOUGLAS W. WAMSLEY
SUSAN N. MILCH
JEFFREY A. COHEN

*N.Y., D.C. BAR ONLY
**N.Y. BAR ONLY
***N.Y., CA BAR ONLY

December 29, 1986

Our File No.
40345-5

BY HAND

Mr. Robert D. Zollner
New Jersey Department of
Environmental Protection
Division of Waste Management
2 Babcock Plaza
West Orange, New Jersey 07072

Re: Orbis Products Corporation
55 Virginia Street
Newark, New Jersey

Dear Mr. Zollner:

As you know, this firm represents Orbis Products Corporation ("Orbis") concerning the above-captioned plant. This letter transmits individual responses to the various Notices of Violation ("NOVs") issued to Orbis under the Solid Waste Management Act, N.J.S.A. 13:1E-1 et seq., and the Spill Compensation and Control Act (the "Spill Act"), N.J.S.A. 58:10-23-11 et seq., on November 21, 1986. This letter also provides information essential to an understanding of operations and conditions at the plant and Orbis' position regarding the legal and factual sufficiency of the NOVs. Consequently, this letter is intended and should be construed to constitute an integral part of each of Orbis' responses to the NOVs, which responses are set forth in the Attachment hereto.

I. BACKGROUND

Orbis operates a chemical manufacturing and blending facility at 55 Virginia Street, Newark, New Jersey. As you observed during your recent inspections, this facility is involved in custom blending, distillation and fractionation of batch-sized quantities of various products. The plant manufactures aromatic chemicals for use in the flavors and fragrances industry, as well as fine organic chemical intermediates.

In November 1980, Orbis submitted a Part A Application to the U.S. Environmental Protection Agency ("USEPA") pursuant to §3005(c) of the Resource Conservation and Recovery Act ("RCRA") in order to obtain interim status for material generated at the site and accumulated there in a wastewater treatment (neutralization) system and drums. At the time of that submission Orbis was uncertain whether it would be considered subject to RCRA regulation as a treatment, storage or disposal facility (TSDF). Nevertheless, Orbis, as did hundreds if not thousands of other generators nationwide, sought the protection afforded by interim status as insurance against any conceivable subsequent contention that the facility was operating without proper authorization.

Indeed, shortly thereafter Orbis determined that interim status was unnecessary and inapplicable to its operations, which did not encompass any TSDF activities since both the wastewater treatment system and the drums were exempt: the former as an Industrial Waste Management Facility ("IWMF") and the latter because waste was not stored there for more than 90 days. Consequently, on June 16, 1981 and again on February 8, 1983 Orbis petitioned the USEPA to delist the facility. The USEPA never responded to either of those requests.

By counsel's letter dated October 8, 1985, Orbis petitioned the NJDEP for delisting. NJDEP responded by letter dated December 10, 1985 from Mr. Frank Coolick to Mr. William Amaducci. In that letter Mr. Coolick stated

that the wastewater treatment facility may be an IWMF, and suggested that Orbis both conduct soil sampling in the area where drums had been maintained and apply for an exemption for an above-ground steel tank at the plant.

Since 1983 Orbis has undertaken a coordinated program to scale down operations at the facility and to remove containers of intermediates, products and waste materials.* Some of this work has been undertaken based on input from the NJDEP. As part of this program, Orbis has cleaned out the wastewater treatment system and has removed numerous containers from the facility. Some of those containers have been determined to contain hazardous waste and have been properly manifested and disposed of in secure, permitted facilities. Others have been subjected to further processing and sold in the ordinary course of business.

II. DELISTING

As set forth in a letter dated June 11, 1986 from Mr. Kenneth Goldstein, Chief, Industrial Pretreatment Section, Bureau of Industrial Waste Management, to Mr. William Amaducci of Orbis, NJDEP has determined that the wastewater treatment system is an IWMF subject to regulations at N.J.A.C. 7:A-144.1 et seq., and does not require a hazardous waste facility permit. Mr. Goldstein indicated that as an IWMF, the facility is considered to be a Significant Indirect User ("SIU") and, accordingly, should apply for a NJPDES/SIU permit. Orbis expects to submit that application shortly.

---

*The statement in the NJDEP Inspection Report (regarding the inspections of November 17 and 21) that "The facility is not currently operating" is erroneous. Also untrue is the entry at page B of the Inspection Report indicating that hazardous wastes are "brought from off-site for reworking/reprocessing/storage pending disposal." Without going into further detail here, we also take issue with several other observations set forth in that Inspection Report, including some statements attributed to Mr. William Amaducci.

NJDEP also has requested Orbis to perform soil sampling to eliminate concern regarding possible contamination in the area where the drums had been located. Our consultant, Dames & Moore, already has been working on this project.

Further, as mentioned above, with respect to the steel tank, which Orbis refers to as "OT-100" and which has been used to bulk waste in preparation for offsite disposal, NJDEP has recommended that Orbis submit a request for exemption as a tank used for storage of hazardous waste for 90 days or less. Orbis has requested appropriate application information from NJDEP.

Orbis is pursuing all of these activities so that the delisting process can be concluded expeditiously.

III. NOTICES OF VIOLATION

On November 21, 1986 the New Jersey Department of Environmental Protection ("NJDEP") issued thirty-three (33) separate NOVs to Orbis. Those NOVs were signed and served by Robert D. Zollner, Investigator, Division of Waste Management. Initially, as to all of the NOVs we are forced to assert the objection that they are conclusory and so lacking in specific findings that they are deficient as a matter of law. Moreover, the lack of specific findings of fact in the NOVs makes it difficult if not impossible to provide adequate responses. In effect, Orbis has not been provided information necessary to understand the violations charged.

In an effort to obtain more specific information from the NJDEP, by letter dated December 2, 1986 Orbis, through its counsel, has requested Department records, including records relating to the inspections that apparently formed the basis of the NOVs. One "Inspection Report" and one "Trenton Dispatch Notification Report" were disclosed to counsel on December 17, 1986. Unfortunately, while these documents provide some additional information, they also are conclusory and lacking in precise and adequate description. Moreover, NJDEP personnel have

been unwilling to verbally divulge much additional information regarding their observations that formed the basis of the NOVs. Despite these infirmities, Orbis hereby makes its best effort to respond to the NOVs.

As to seventeen (17) of the NOVs, Orbis asserts the general legal objection that they are inapplicable to Orbis and are of no legal force and effect because they relate to alleged violations of provisions which specifically and solely regulate those entities which treat, dispose or store hazardous wastes. As set forth above, Orbis is not a TSDF and has consistently maintained that position since 1981. Rather, Orbis is a generator only, since hazardous waste does not remain on the premises for more than 90 days. Orbis responds to these 17 NOVs in Section I of the Attachment to this letter.

Orbis concedes that the regulations cited in twelve (12) of the NOVs arguably apply to generators such as Orbis. Those regulations are: N.J.A.C. 7:26-9.4(g); N.J.A.C. 7:26-9.6; N.J.A.C. 7:26-9.7; N.J.A.C. 7:26-7.2; and N.J.A.C. 7:26-9.4(d). Orbis responds to these 12 NOVs in Section II of the Attachment hereto.

Four (4) of the NOVs allege violations of the Spill Act. Orbis responds to those allegations in Section III of the Attachment hereto.

## IV. PLANNED ACTIONS

Orbis is continuing and expediting the ongoing procedures dating from 1983 whereby containers are inspected and decisions made as to their disposition. Orbis has set a target date of February 19, 1987 for completing this process. If Orbis determines that the contents of any container no longer can be considered to be usable product, and if any such materials are determined to be hazardous waste, they will be handled and disposed of as required by the Solid Waste Management Act. In no event would any such hazardous waste remain at the plant for longer than 90 days.

Orbis also will perform the two investigations that NJDEP has requested. Toward that end, Orbis has been consulting with its environmental consultant, Dames & Moore, regarding preparation and implementation of sampling plans with respect to the areas where drums once were accumulated and from which the underground tanks were excavated. These actions are not and should not be construed as an acknowledgement of any closure activity by Orbis since Orbis never has operated as a TSDF. Rather, these actions constitute accommodations to NJDEP in the interest of alleviating any environmental concerns that may exist.

Furthermore, while Orbis holds that it has been in substantial compliance with the requirements of N.J.A.C. 7:26-9.6 (Preparedness and Prevention), N.J.A.C. 7:26-9.7 (Contingency Plan and Emergency Procedures), N.J.A.C. 7:26-9.4(g) (Personnel Training), and N.J.A.C. 7:26-9.4(d)5 (Daily Inspection Requirements), Orbis is proceeding to make arrangements to formalize these efforts. We will inform NJDEP of our schedule for completing these procedures as soon as it is finalized.

Moreover, as indicated in the Attachment hereto, Orbis already has alleviated many of the concerns registered in the NOVs by such actions as overpacking and repacking several drums, securing the lids on others and posting "No Smoking" signs in additional areas.

We believe that these actions clearly evidence Orbis' continued cooperation with the NJDEP as well as our intention to operate the plant in full compliance with all applicable laws and regulations.

If you have any questions concerning the above or the Attachment hereto, please do not hesitate to contact me. We look forward to a prompt resolution of this matter,

and, indeed, hope that this submittal will go a long way toward bringing the matter to a close. We will keep you informed of our progress.

Very truly yours,

HANNOCH WEISMAN

By _____
Lawrence W. Diamond

LWD/hl
Attachment
cc: Robert M. Amaducci
Michael Schuit, Esq.

# ATTACHMENT

## SECTION I

**N.J.A.C. 7:26-9.10** **Failure to meet financial requirements for facility closure**

It is alleged that Orbis failed to meet the financial requirements for facility closure as required by N.J.A.C. 7:26-9.10, which provides that owners and operators of all hazardous waste facilities, except as provided in N.J.A.C. 7:26-9.1, must have a written estimate of the cost of closing a facility. Expressly excepted from these financial requirements are generators, such as Orbis, that accumulate waste on site for ninety (90) days or less.

Therefore, this regulation does not apply to Orbis, which has never been a treatment, storage or disposal facility in fact. Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.13** **Failure to meet liability requirements**

It is alleged that Orbis failed to meet the liability requirements of N.J.A.C. 7:26-9.13, which provide that an owner or operator of a hazardous waste treatment, storage or disposal facility must demonstrate financial responsibility and maintain liability coverage for sudden and accidental occurrences resulting in bodily injury or property damage to third parties. This regulation, by its terms, does not apply to a generator, such as Orbis, that accumulates waste on site for ninety (90) days or less.

Therefore, this regulation does not apply to Orbis, which has never been a treatment, storage or disposal facility in fact. Orbis respectfully requests that this NOV be withdrawn.

N.J.A.C. 7:26-9.8(g) **Failure to notify Department of closure activity**

It is alleged that Orbis failed to notify the NJDEP of closure activity, as required by N.J.A.C. 7:26-9.8(g), which expressly provides that an owner or operator shall notify the Department at least one hundred eighty days prior to the date the owner or operator expects to begin closure, except in cases where the facility's permit is terminated or the facility is otherwise ordered by official decree or compliance order to cease receiving wastes or to close. The dates when the owner or operator "expects to begin closure" should be within thirty days after which the owner or operator expects to receive the final volume of wastes.

Generally, N.J.A.C. 7:26-9.8 applies to owners or operators of all hazardous waste facilities except as provided in N.J.A.C. 7:26-9.1. N.J.A.C. 7:26-9.1(c)4 specifically excludes from the requirements of this regulation hazardous waste generators, such as Orbis, that accumulate waste on site for ninety (90) days or less. Thus, generators like Orbis need not notify the Department of closure activity pursuant to N.J.A.C. 7:26-9.8(g). Furthermore, closure activity has not and cannot have taken place at the Orbis site since Orbis is not a treatment, storage or disposal facility. Finally, Orbis operations have not terminated; Orbis merely has undertaken a program to scale down its operations at the Newark facility.

Therefore, Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.4(b)** **No Waste Analysis Plan**

It is alleged that Orbis does not have a waste analysis plan as required by N.J.A.C. 7:26-9.4(b):

> (b) Before an owner or operator treats, stores, or disposes of any hazardous waste, the owner or operator shall obtain a detailed chemical and physical analysis of a representative sample of the waste.

This Notice of Violation clearly applies only to an owner or operator that treats, stores or disposes of hazardous waste. Orbis, however, is only a generator of hazardous waste, which is not accumulated on site for more than ninety (90) days.

While the necessity for a waste analysis plan applies to TSD facilities, there is no equivalent requirement for generators. See N.J.A.C. 7:26-9.3.

Although not required by N.J.A.C. 7:26-9.3 to maintain a waste analysis plan, Orbis continues the process of reviewing and analyzing the materials at the plant.

Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.8** **No Closure Plan**

It is asserted that Orbis does not have a closure plan as required by N.J.A.C. 7:26-9.8, which sets forth general requirements for the closure of any hazardous waste facility. Specifically excluded from this regulation are those handlers of hazardous waste identified in N.J.A.C. 7:26-9.1, which include generators, such as Orbis, that accumulate hazardous wastes on site for ninety (90) days or less.

Accordingly, this NOV does not apply to Orbis. Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.4(m)** **Failure to allow inspection by authorized Department representative**

It is alleged that Orbis failed to allow an inspection by an authorized Department representative. N.J.A.C. 7:26-9.4(m) expressly provides that:

> (m) The Department and its authorized representatives shall have the right to enter and inspect any building or other portion of the facility for the purpose of:
>
> 1. Investigating an actual or suspected source of pollution of the environment; and
>
> 2. Ascertaining compliance or noncompliance with statutes of the State of New Jersey or any rules or regulations of the Department.

The NOV is so unspecific that it is legally deficient: it does not specifically allege what a Department representative could not inspect, or when he could not inspect it. However, if Mr. Zollner is referring to the events of November 17, 1986, Orbis responds as follows.

As recited in the attached affidavits of Mr. William Amaducci and Mr. Albert DeVigili (Exhibits A and B), on November 17, 1986 as well as on subsequent occasions Orbis allowed NJDEP representatives to inspect all portions of the plant to which they sought access. While the NJDEP inspectors may not have completed their inspection on November 17, they did not insist on

doing so and, as was communicated to them on that day, would not have been barred from doing so. The inspectors agreed to return on November 21 to continue their inspection.

On Friday, November 21, 1986, and again on Wednesday, November 26, 1986, the NJDEP representatives were provided access to any and all parts of the facility and to available records at their request. At no time has Orbis prevented or impeded NJDEP inspection of plant premises or records. We further note that the NJDEP Inspection Report purportedly prepared by Mr. Zollner makes no reference to any problems regarding access.

Therefore, no corrective action has been necessary with respect to the allegations set forth in this NOV. If NJDEP were to assert that corrective action was required, such corrective action certainly has been taken by facilitating the inspections on November 21 and November 26. Consequently, Orbis has been and remains in full compliance with N.J.A.C. 7:26-9.4(m).

Accordingly, this NOV is unfounded, and Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.4(k)1** **Records not available as required**

It is alleged that Orbis records were not available as required by N.J.A.C. 7:26-9.4(k)1, which expressly provides that:

> (k) Records shall be available according to the following requirements:
>
> > 1. All records shall be furnished upon the request, and made available at all reasonable times for inspection, by any officer, employee, or representative of the Department who is duly designated by the Department.

The NOV is legally deficient in that it does not specify which records allegedly were not available, and when they allegedly were not available. For the purpose of this response, Orbis will assume that the NOV is referring to records, i.e. manifests, originally requested on November 17, 1986.

As stated in the response to the NOV issued for the alleged violation of N.J.A.C. 7:26-9.4(m), which response is incorporated herein by reference, on November 17 manifests were not available at the Newark plant because they were in the possession of the plant Manager, William Amaducci, at the Orbis office in Boonton, New Jersey. Had the inspector insisted that Mr. Amaducci produce the records at the time (which, we believe, would have been unreasonable), Mr. Amaducci would have done so. However, Messrs. Zollner and Amaducci agreed that the records could be made available on November 21. In fact, the records

were available for inspection at the Newark plant on November 21 and November 26, 1986.

Therefore, reasonable access to records was afforded NJDEP. Orbis asserts that in fact it has not violated N.J.A.C. 7:26-9.4(k)1, and that no corrective action was necessary with regard to the allegations set forth in this NOV. If NJDEP were to assert that corrective action was required, such corrective action certainly has been taken by facilitating the inspections and records review described above. Furthermore, Orbis is taking the step of making photocopies of its records so that they will be available at both its Boonton and Newark offices.

Accordingly, Orbis has been and remains in full compliance with N.J.A.C. 7:26-9.4(k)1. Orbis respectfully requests that this NOV be withdrawn.

N.J.A.C. 7:26-9.12(a)9i — **Failure to yield authorized Department representative access to container storage area for inspection on 11/17/86**

It is alleged that Orbis Products failed to provide authorized Department representatives access to a container storage area for inspection on November 17, 1986, as required by N.J.A.C. 7:26-12.4(a)9i, which provides:

> 9. The permittee shall allow an authorized representative of the Department upon presentation of credentials to:
>
> > 1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where the records should be kept under the conditions of this permit.

This NOV is legally deficient in that it fails to identify the container storage area from which the Department representative allegedly was barred.

The narrative and accompanying affidavits comprising the Orbis response to the NOV issued for an alleged violation of N.J.A.C. 7:26-9.4(m) are incorporated by reference herein. As noted in that response, any requested inspection did take place at a reasonable time as determined by the mutual agreement of NJDEP and Orbis.

Therefore, this NOV is unfounded, and Orbis respectfully requests that it be withdrawn.

**N.J.A.C. 7:26-12.4(a)9ii** **Failure to give access to records required by permit**

It is alleged that Orbis failed to provide access to records as required by its permit. N.J.A.C. 7:26-12.4(a)9ii provides that:

> 9. The permittee shall allow the authorized representative of the Department upon presentation of credentials to:
>
> > ii. Have access to and copy any records that shall be kept under the conditions of this permit.

This NOV is legally deficient in that it fails to identify the records to which access allegedly was denied, and when such access allegedly was not given.

As discussed in the Orbis response to the NOVs issued for the alleged violations of N.J.A.C. 7:26-9.4(m) and N.J.A.C. 7:26-9.4(k)1, which responses are incorporated herein by reference, access to Orbis records was provided NJDEP.

Therefore, this NOV is unfounded, and Orbis respectfully requests that it be withdrawn.

**N.J.A.C. 7:26-12.4(a)9iii** **Failure to allow inspection of logs and control facilities of container storage area**

It is alleged that Orbis failed to allow an inspection as required by permit and N.J.A.C. 7:26-12.4(a)9iii, which provides:

> 9. The permittee shall allow an authorized representative of the Department upon presentation of credentials to:
>
> > iii. Inspect any facilities, equipment (including monitoring equipment), practices, or operations regulated or required under this permit.

This NOV is legally deficient in that it fails to identify the container storage area which allegedly could not be inspected or when such inspection allegedly could not take place. If the NOV refers to the events of November 17, 1986, Orbis responds as follows: any inspection not conducted on November 17, 1986 was rescheduled per the mutual agreement of Mr. Zollner and Mr. Amaducci, as described in the Orbis responses to the NOVs issued for the alleged violations of N.J.A.C. 7:26-9.4(m) and N.J.A.C. 7:26-9.4(k)1, which responses are incorporated herein by reference.

Therefore, this NOV is unfounded, Orbis respectfully requests that it be withdrawn.

N.J.A.C. 7:26-12.4(a)9iv — **Failure to give access to container storage area for sampling substances**

It is alleged that Orbis failed to provide access as required by permit and N.J.A.C. 7:26-12.4(a)9iv, which provides:

> 9. The permittee shall allow an authorized representative of the Department upon the presentation of credentials to:
>
> > iv. Sample or monitor for the purpose of assuring permit compliance as otherwise authorized by the Solid Waste Management Act (N.J.S.A. 13:1E-1 et seq.), any substances or parameters at any location.

This NOV is legally deficient in that it fails to identify the container storage area from which the Department representative allegedly was barred, and when such access allegedly was not given.

As discussed in the Orbis response to the NOV issued for the alleged violation of N.J.A.C. 7:26-9.4(m), which response is incorporated herein by reference, access to the container storage area was provided, for sampling and any other legitimate purpose. Further, the NJDEP representatives did not indicate any desire to conduct sampling on November 17 or 21, except that on November 21 Mr. W. Amaducci assisted Mr. Zollner to take a sample from tank OT-100. On November 25, counsel was informed by a NJDEP representative that the Department intended to conduct sampling on November 26. Orbis mobilized its consultant, Dames &

Moore, to attend the November 26 inspection to take splits of any samples extracted. In fact, however, NJDEP did not take any samples on November 26.

Therefore, this NOV is unfounded, and Orbis respectfully requests that it be withdrawn.

N.J.A.C. 7:26-12.4(a)8 **Failure to formally correspond with BHWE/DEP**

It is alleged that Orbis failed to formally correspond with the Bureau of Hazardous Waste Engineering of the NJDEP with respect to Bureau letters of December 10, 1985, May 16, 1986, and August 1, 1986 regarding permit information, as required by N.J.A.C. 7:26-12.4(a)8.

These letters, however, did not refer to required permit information, but, rather, to information regarding Orbis' delisting and exemption requests for the facility. In fact, Orbis initiated this correspondence.

As noted, Orbis is in the process of gathering the required information for the delisting and exemption requests for the facility, and will forward this information to the Department as soon as it becomes available. Further, Orbis has been consulting with its environmental consultant, Dames & Moore, with respect to the requested soil sampling. It must be further noted that the NJDEP has not been prejudiced. Rather, only Orbis has suffered any negative consequences of failing to promptly respond to the NJDEP's request for information concerning Orbis' delisting.

Therefore, Orbis asserts that the aforementioned NOV is an inappropriate exercise of NJDEP's prosecutorial discretion. Orbis respectfully requests that this NOV be withdrawn.

N.J.A.C. 7:26-9.4(f) **Failure to meet general inspection requirements**

It is alleged that Orbis failed to meet the general inspection requirements set forth in N.J.A.C. 7:26-9.4(f).

Orbis, however, is not a hazardous waste facility, and thus is not required to adhere to the general inspection requirements in N.J.A.C. 7:26-9.4(f). Orbis maintains that it is a generator accumulating hazardous waste on site for ninety (90) days or less.

Nevertheless, Orbis does conduct daily inspections of the plant and takes necessary and appropriate actions to prevent leaks or discharges of any kind.

Therefore, this NOV is unfounded, and Orbis respectfully requests that it be withdrawn.

N.J.A.C. 7:26-12.3(b)2 Unauthorized operation of SO2 activity

It is alleged that Orbis conducted an SO2 (tank storage) activity without authorization. The NOV asserts that Orbis should have included this activity in its Part A application as required by N.J.A.C. 7:26-12.3(b)2.

However, Orbis maintains that at the time it filed the Part A application the activity complained of was exempt under the Federal regulations which exempt generators who accumulate hazardous waste on site for ninety (90) days or less. See 40 CFR 262.34. Further, the Federal regulation did not require the filing of an application.

Subsequently, the NJDEP promulgated its regulations whereby a short-term storage activity continued to be exempted, but for which an application was required. Orbis presently is in the process of complying with that regulation, and expects that the exemption will be granted.

Considering the existence of the EPA regulation, which applied to the tank in question, and the fact that the tank has not been used for almost one year (although it is being maintained for use and may be used again in the near future), Orbis maintains that the NOV for the unauthorized operation of SO2 tank storage activity was an inappropriate exercise of NJDEP's prosecutorial discretion, and Orbis respectfully requests that it be withdrawn.

**N.J.A.C. 7:26-9.4(e)1** **Wastes not protected from ignition or reaction**

It is alleged that Orbis failed to protect wastes from ignition or reaction as stipulated by N.J.A.C. 7:26-9.4(e)1, which provides that the owner or operator shall take precautions to prevent ignition or reaction of ignitable or reactive waste.

This NOV is legally deficient in that it does not specify which containers allegedly were not protected from ignition or reaction, or what protection allegedly was not afforded.

As a generator that stores waste on site for ninety (90) days or less, Orbis is not subject to this regulation. Nevertheless, Orbis asserts that it is and has been in full compliance with the requirements of N.J.A.C. 7:26-9.4(e)1. Any materials kept at the facility are adequately protected from open flames, smoking, cutting, hot surfaces, frictional heat, sparks and other activities that may result in an accidental ignition or reaction.

Therefore, this NOV is unfounded, and Orbis respectfully requests that it be withdrawn.

**N.J.A.C. 7:26-9.4(e)2** **Failure to follow requirements for ignitable or reactive waste storage**

It is alleged that Orbis failed to follow the requirements for ignitable or reactive waste storage as required by N.J.A.C. 7:26-9.4(e)2, which provides that the treatment, storage, or disposal of ignitable or reactive waste, and the mixture of incompatible waste, or incompatible waste and materials, shall be conducted so that it does not generate extreme heat or pressure, produce uncontrolled toxic mists, produce uncontrolled flammable fumes, damage the structural integrity of the device or facility containing the waste, or threaten human health or the environment.

This NOV is legally deficient for failing to specify what requirements for which waste storage activities allegedly were not being followed. Moreover, Orbis contends that the cited violation is inappropriate and unfounded because Orbis does not treat, store or dispose of ignitable or reactive waste at the plant, although at times it may accumulate such waste for ninety (90) days or less.

Therefore, Orbis maintains that this NOV is unfounded, and respectfully requests that it be withdrawn.

N.J.A.C. 7:26-9.4(e)liii Failure to confine smoking by posting signs

It is alleged that Orbis failed to confine smoking by posting signs as required by N.J.A.C. 7:26-9.4(e)liii, which provides that the owner or operator shall take precautions to prevent accidental ignition or reaction of ignitable or reactive waste by conspicuously placing "No Smoking" signs wherever there is a hazard from ignitable or reactive waste.

This NOV is legally deficient for failing to identify the area or areas where such signs are alleged not to have been posted. Also, Orbis does not store ignitable or reactive waste, although at times it may accumulate such waste for ninety (90) days or less. However, it is company policy not to allow smoking in any area where such wastes are accumulated. In fact, smoking is allowed only in designated smoking areas, such as the lunch room, locker rooms and offices. Smoking is not even permitted in any outdoor area of the plant.

Further, in response to receipt of this NOV Orbis has conspicuously placed "No Smoking" signs where ignitable or reactive waste accumulation may occur.

Therefore, this NOV is unfounded as applied to Orbis, and Orbis respectfully requests that it be withdrawn. However, if corrective action had been necessary, such action certainly has been taken as described above.

# SECTION II

N.J.A.C. 7:26-9.4(d)2 Containers in very poor condition

It is alleged that Orbis containers are in very poor condition in violation of N.J.A.C. 7:26-9.4(d)2, which sets forth the requirements for the use and management of containers. Subsection 2 provides that:

> 2. If a container holding hazardous waste is not in good condition, or if it begins to leak, the owner or operator should transfer the hazardous waste from the container to a container that is in good condition, or manage the waste in some other way that complies with the requirements of the section.

This NOV is legally deficient in that it does not provide sufficient information identifying which containers are alleged to be in "very poor condition". However, Orbis maintains that company policy provides that containers at the plant found to be in poor condition during daily inspections are to be overpacked or repacked to prevent loss or discharge of materials. In any case, Orbis is expediting its ongoing container and materials review procedure to ensure the adequacy of all containers. Thus, at the present time, Orbis is taking all necessary precautions to conform to the requirements for use and management of containers as set forth in N.J.A.C. 7:26-9.4(d)2.

Therefore, Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.4(d)4i** **Failure to close containers**

It is alleged that Orbis failed to close containers as required by N.J.A.C. 7:26-9.4(d)4i, which provides that, except during filling or emptying, containers of hazardous waste shall be securely closed so that there is no escape of hazardous waste or vapors.

This NOV is legally deficient for failing to identify allegedly unclosed containers. Further, Orbis contends that none of the containers found not to be closed are known to contain hazardous waste.

Nevertheless, any containers that may not have been thoroughly closed during the NJDEP inspection on November 21, 1986 were closed immediately following that inspection. Orbis conducts daily inspections of the containers to ensure that the containers have remained closed and that there are no discharges or leaks of materials or vapors.

Therefore, Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.4(d)4iii** **Containers not properly handled**

It is alleged that Orbis did not handle containers properly as stipulated by N.J.A.C. 7:26-9.4(d)4iii. N.J.A.C. 7:26-9.4(d)4iii expressly provides that a container holding hazardous waste shall not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

This NOV is legally deficient for failing to adequately identify the containers or the manner in which they were alleged to have been improperly handled. However, when counsel questioned NJDEP about this NOV, one of the Department inspectors mentioned that some drums were observed to have been lying on their sides.

The usual method for handling drums is to maintain them in an upright position. However, it is not necessarily improper to store drums on their sides. In fact, there are circumstances under which it is necessary and appropriate to turn drums on their side, e.g., while filling side-bunged drums, or to avoid accumulation of water on the head to alleviate external corrosion.

Orbis asserts that all containers handled on the property are handled properly, and when hazardous waste is identified any containers of such waste are handled in accordance with the requirements of N.J.A.C. 7:26-9.4(d) and will continue to be so

handled. Orbis inspects the containers on a daily basis to ensure compliance.

Orbis maintains that it has complied and will continue to comply with the requirements of N.J.A.C. 7:26-9.4(d). Therefore, Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.4(d)4iv** **Containerized hazardous waste not segregated**

It is alleged that containerized hazardous wastes were not segregated as required by N.J.A.C. 7:26-9.4(d)4iv, which stipulates that containerized hazardous waste shall be segregated in storage by waste type.

This NOV is legally deficient for failing to identify the allegedly hazardous waste that was not segregated. However, Orbis is in the process of reviewing the materials in the containers and will appropriately segregate any deemed to contain hazardous waste. Orbis' consultant is assisting the company in making these determinations and in any necessary segregation of hazardous waste.

Accordingly, Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.4(d)4v** **Container identification label not visible**

It is alleged that a container identification label was not visible in accordance with N.J.A.C. 7:26-9.4(d)4v, which stipulates that every container of hazardous waste shall be arranged so that its identification label is visible.

This NOV is legally deficient for failing to adequately identify the container alleged not to have had a visible label.

Most containers have a batch tag which sufficiently identifies the material contained therein. Nonetheless, during the continuing and expedited container review process Orbis will take appropriate action to ensure that all container identification labels are clearly visible, whether the container holds product or hazardous waste. Note that item (10) of the excerpt from the Orbis "Workers Manual", annexed hereto and labelled Exhibit C, states the company policy that workers shall "[i]nclude all information when stencilling drums."

Therefore, Orbis respectfully requests that this NOV be withdrawn.

N.J.A.C. 7:26-9.4(d)5 **No container inspection**

It is alleged that Orbis does not conduct container inspections as required by N.J.A.C. 7:26-9.4(d)5, which expressly provides that the owner or operator shall inspect areas where containers of hazardous waste are stored, at least daily, looking for leaks and for deterioration caused by corrosion or other factors.

Orbis maintains that a daily inspection of the containers is conducted. In fact, Orbis has a 24-hour guard service and time clock mechanisms which ensure that container areas are inspected on a daily basis. The guard has instructions, and the necessary information, to contact Orbis officials to report any irregularities. During this daily inspection, the containers are checked for leaks and other evidence of deterioration and corrosion. Further, Orbis plant personnel inspect container areas each working day. In addition, Orbis is in the process of instituting a daily log so that the daily inspections and results thereof can be appropriately recorded. Finally, item (8) of Exhibit C hereto sets forth the Orbis company policy instructing workers to "[g]et in the habit of looking for leakers anywhere in the plant."

Nevertheless, a formalized inspection procedure will be prepared.

Orbis contends that this NOV is unfounded, and respectfully requests that it be withdrawn.

**N.J.A.C. 7:26-9.4(d)6** **Containers less than 50 feet from property line**

It is alleged that containers are less than 50 feet from the property line in violation of N.J.A.C. 7:26-9.4(d)6, which expressly provides that containers holding ignitable or reactive waste shall be located at least 50 feet (15 meters) from the facility's property line.

This NOV is legally deficient because it fails to adequately identify those container alleged to contain ignitable or reactive waste and to be within 50 feet of the property line.

Orbis' ongoing and expedited process of reviewing and analyzing materials at the plant will ensure that if any ignitable or reactive wastes are determined to exist at the plant, they will not be maintained within 50 feet of the property line.

Therefore, Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.4(d)7iii** **Failure to physically separate incompatible wastes**

It is alleged that Orbis failed to physically separate incompatible wastes as required by N.J.A.C. 7:26-9.4(d)7iii, which provides that a storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, open tanks, or surface impoundments shall be separated from the other materials or protected from them by means of a dike, berm, wall or other device.

This NOV is legally deficient for failing to adequately identify the wastes or containers thereof alleged not to have been physically separated.

Nevertheless, Orbis is in the process of reviewing the materials stored in the containers and will physically separate any deemed to contain hazardous wastes that are incompatible with any waste or other material stored nearby in other containers.

Therefore, this NOV is unfounded, and Orbis respectfully requests that it be withdrawn.

**N.J.A.C. 7:26-9.4(g)** **No personnel training records**

It is alleged that Orbis does not have personnel training records as required by N.J.A.C. 7:26-9.4(g), which provides that facility personnel should successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that insures the facility's compliance with the requirements of the regulation.

Orbis maintains that all personnel employed at the Newark site have been adequately trained to respond appropriately and effectively to emergency situations. However, as stated in the accompanying letter from Mr. Diamond to Mr. Zollner, Orbis will develop a more formal personnel training procedure.

Orbis respectfully requests that this NOV be withdrawn.

**N.J.A.C. 7:26-9.7** **No Contingency Plan**

It is alleged that Orbis does not have a contingency plan as required by N.J.A.C. 7:26-9.7, which sets forth the elements to be addressed by contingency plans and the procedures to be followed in the case of an emergency.

Orbis maintains that the company presently has a contingency plan and procedures to be followed in case of an emergency. However, as stated in the accompanying letter from Mr. Diamond to Mr. Zollner, a more formal contingency plan will be developed in the near future.

**N.J.A.C. 7:26-9.6(f)** **Necessary arrangements not made**

It is alleged that Orbis failed to make the necessary emergency preparedness and prevention arrangements with local organizations, such as local police, fire and emergency response teams, pursuant to N.J.A.C. 7:26-9.6(f).

As a generator, Orbis has made all arrangements deemed appropriate in appreciation of the types of substances handled at the site. For example, the Newark Fire Department visits the plant periodically, and Orbis presently possesses and has posted Fire Safety Permit No. 805. Also, Orbis has ongoing arrangements with St. Elizabeth Hospital in Elizabeth to handle any injuries that may occur at the plant. However, as stated in the accompanying letter from Mr. Diamond to Mr. Zollner, Orbis is in the process of formalizing these relationships.

**N.J.A.C. 7:26-7.4(a)4vii** **Improper manifest form for quantity and type**

It is alleged that Orbis violated N.J.A.C. 7:26-7.4(a)4viii, which provides that a generator must provide the following information on a manifest form:

> vii. The name, type and quantity of hazardous waste being shipped, including such particulars as may be required regarding same.

The NOV is legally deficient in that it does not specify which information in the manifest allegedly was incorrect. Based on discussions with the inspectors, however, Orbis admits that even though the material was correctly handled and transported, several manifests appear to have been improperly coded. As explained to the inspectors on November 21, the error was an inadvertent oversight, in that the individual filling out the manifest forms used the container code "DM" (for drums) rather than "DT" (for trailers). Apparently, these particular manifests had been pretyped with the expectation that they would be used for a load of drums, and the oversight was in not changing the letter "M" to "T".

Orbis will correct manifests and include the corrected forms in the Annual Report to be submitted to the NJDEP in March 1987. Orbis is, therefore, taking all necessary action in order to comply with the requirements of N.J.A.C. 7:26-7.4(a)4vii.

# SECTION III

| | |
|---|---|
| N.J.S.A. 58:10-23.11(c) and (e) | Hazardous substances... continually discharge in container storage |

These NOVs alleging discharge of hazardous substances and failure to notify thereof are legally deficient for failing to adequately identify the subject matter of the alleged violations. Furthermore, the inspectors have been reluctant or unable to reveal sufficient details about this alleged discharge. However, suffice it to note that under the statutory authority cited, the threshold jurisdictional requirement for any discharge is the entry of a hazardous substance "into the waters or onto the lands of the State...". The NOV fails to set forth any facts to support a finding that a hazardous substance has entered into waters or onto land.

The allegation of the "seriousness" of the threat to the environment and/or human health is difficult to understand since fire fighting equipment, spill control equipment, and round-the-clock security services are provided. Furthermore, despite the alleged "seriousness" of the condition, at no time during three separate facility inspections did the inspector specifically indicate the need for any immediate remedial action. Finally, again, the NJDEP has not been forthcoming with detailed information about the basis of this allegation, despite multiple requests.

Orbis makes no assumptions about the alleged discharge, including where it is alleged to have occurred. However, if NJDEP were to allege that the discharge occurred in Building 18, there would be no basis in fact or in law for such an assertion. Building 18 is a closed, secure structure. The containers are housed therein on a concrete floor in which there are no drains or other conduits to the outside.

Nevertheless, as indicated in item (8) of Exhibit C annexed hereto, any drums that may be found to be leaking will continue to be addressed immediately upon discovery. Orbis presently is not aware of any leaking containers at the plant.

With respect to the allegation of non-notification, since there was no discharge there could not be a failure to notify.

Therefore, these NOVs are unfounded, and Orbis respectfully requests that they be withdrawn.

| | |
|---|---|
| N.J.S.A. 58:10-23.11(c) and (e) | **Hazardous substance discharge as evidenced by corrosion holes in excavated underground tanks...** |

This NOV appears to be based on the presumption that visual evidence of tank corrosion is sufficient to support a finding of discharge under N.J.S.A. 58:10-23.11(c). Although there are several factual circumstances under which this presumption would clearly be rebutted (i.e., tank empty during corrosion; positive hydraulic pressure causing tank to fill rather than leak, etc.), Orbis has begun working with its environmental consultant, Dames & Moore, toward implementation of the requested subsurface investigation at the former location of the tanks. Such investigation should not be construed as an acknowledgment of any closure liability or an agreement to proceed with remediation. Rather, it will be conducted as an accommodation to the NJDEP.

The parallel violation of N.J.S.A. 58:10-23.11(e) appears to further presume knowledge of or liability for a discharge, which presumption is erroneous.

Therefore, this NOV is unfounded, and Orbis respectfully requests that it be withdrawn.

**EXHIBIT A**

AFFIDAVIT

STATE OF NEW JERSEY )
SS.:
COUNTY OF ESSEX )

WILLIAM R. AMADUCCI, being of full age and duly sworn according to law, says to the best of his knowledge and belief:

1. I am Manager of the Orbis Products Corporation ("Orbis") Plant at 55 Virginia Street, Newark, New Jersey (the "plant").

2. In this capacity, I am present at the plant on a regular basis and I am familiar with the operations of Orbis at the plant. Orbis also maintains an office at 94 Fanny Road, Boonton, New Jersey, where I frequently do paperwork related to the Orbis business.

3. At approximately 3:00 p.m. on Monday, November 17, 1986, while at the Boonton office, I received a telephone call from Mr. Albert DeVigili, the plant Supervisor. Mr. DeVigili almost immediately gave the phone to an individual who identified himself as Mr. Robert D. Zollner, an inspector with the New Jersey Department of Environmental Protection ("NJDEP"), Division of Waste Management. Mr. Zollner informed me that he was conducting an inspection of the plant, and he requested access to

hazardous waste manifests for materials that Orbis had sent off-site for disposal. At that time, those manifests were in my custody in the Boonton office.

4. I explained to Mr. Zollner that since it was approaching 3:30, the regular shift at the plant was over. I further informed him that leaving the Boonton office at that time would have been very inconvenient, and a hardship, because no one was available at that particular time to substitute for me. Nevertheless, I volunteered to drive from Boonton to Newark at that time if he deemed it necessary.

Mr. Zollner clearly informed me that his inspection authority was not contingent on matters of convenience. However, he then asked me when it would be convenient for me to meet him at the plant, and we agreed on Friday, November 21, 1986. Mr. Zollner did not request that I provide access to Building 18 or any other area of the plant, nor did he indicate that he wished to continue his inspection on November 17. Had Mr. Zollner stated that he had to see the manifests or continue his inspection on that day, I would have travelled to the plant to accommodate him. Mr. Zollner did not indicate that NJDEP might issue any Notice of Violation ("NOV") to Orbis.

5. On Friday, November 21, 1986, I met Mr. Zollner at the plant and he continued his inspection. On that date he was given complete access to the plant, including Building 18, and to

**EXHIBIT B**

AFFIDAVIT

STATE OF NEW JERSEY )
SS.:
COUNTY OF ESSEX )

ALBERT D. DeVIGILI, being of full age and duly sworn according to law, says to the best of his knowledge and belief:

1. I am a Supervisor at the Orbis Products Corporation ("Orbis") plant at 55 Virginia Street, Newark, New Jersey ("the plant").

2. In this capacity, I am responsible for daily operations at the plaint.

3. In the early afternoon on Monday November 17, 1986, while working behind the plant laboratory, I was approached by two men who identified themselves as inspectors with the New Jersey Department of Environmental Protection ("NJDEP"), Division of Waste Management. One of the men introduced himself as Robert D. Zollner. Mr. Zollner indicated that he wanted to inspect the plant.

4. I accompanied the inspectors through the plant grounds and provided them with access as requested, including specifically Buildings 1, 2 and 3. I also explained the location and operation of various equipment and materials.

5. During the inspection Mr. Zollner asked to see hazardous waste manifest forms. I told him that those records were in the Orbis office in Boonton, New Jersey. Mr. Zollner also requested access to Building 18, which was locked. It was necessary to return to the office in order to retrieve the key. While at the office, I phoned Mr. William R. Amaducci, the Manager of the plant, who was at the Boonton office. Mr. Amaducci spoke directly with Mr. Zollner.

6. After speaking with Mr. Amaducci, Mr. Zollner indicated that he would return on November 21, 1986.

Both inspectors then left the plant. Since it was the end of the shift, I also left.

7. Mr. Zollner returned to inspect the plant on November 21. No NJDEP representative requested samples or indicated a desire to take samples on either November 17 or November 21, except that on November 21 Mr. Zollner took a sample from tank OT-100.

8. I make this affidavit in support of Orbis' responses to the Notices of Violation concerning the plant that were issued on Friday, November 21, 1986.

Albert D. DeVigili

Albert D. DeVigili, Supervisor
Orbis Products Corporation

Sworn to and Subscribed to
before me this 19th day of
December, 1986.

Janis DiMarco
Notary Public

JANIS DiMARCO
A NOTARY PUBLIC OF NEW JERSEY
My Commission Expires Oct. 24, 1990

ORBIS PRODUCTS CORPORATION

SAFETY IN DRUM HANDLING:

Almost all of our material is put in drums or taken out of drums. Here are some safety rules on handling drums:

(1) When filling or emptying drums, be sure drums are blocked so they will not roll.

(2) Do NOT fill drums to the top. Leave about four (4) inches for expansion.

(3) Use NEW gaskets for sealing a bung.

(4) Make an after check on filled drums for leaks.

(5) Above all, be sure that the drum you are using is the right one for the job. Check yourself to make sure it is clean, dry and odorless. When in doubt, have your foreman check.

(6) Tighten bungs on all empty drums.

(7) Be sure that the drums you are using have bungs of the same material. For instance, never use a stainless-steel drum with a galvanized bung, etc.

(8) Mark leaking drums plainly as leakers, and transfer material to a sound drum. Get in the habit of looking for leakers anywhere in the plant.

(9) Never put caustic or acid material in a galvanized or aluminum drum. Never put chlorinated material in aluminum drums.

(10) Include all information when stencilling drums. Check tare weight of drum before filling. Re-weigh all drums before emptying into any equipment.

(11) Never lift a full drum by yourself. Use a drum upender or get help.

REFERENCE NO. 9

Let's protect our earth

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT

Michele M. Putnam
Deputy Director
*Hazardous Waste Operations*

John J. Trela, Ph.D., Director
401 East State St.
CN 028
Trenton, N.J. 08625-0028
(609)633-1408

Lance R. Miller
Deputy Director
*Responsible Party Remedial Action*

FAF

SEP 15 1988

Mr. William Amaducci, Manager
Orbis Products Company
55 Virginia Street
Newark, NJ 07114

Dear Mr. Amaducci:

RE: Closure Plan Approval for Storage Tank OT-100 and Delisting Approval for Container Storage Activity for Orbis Products Company, Newark, EPA ID No. NJD 010 910 099, CP-88-8

The Bureau of Hazardous Waste Engineering acknowledges receipt of a closure plan and revision dated February 1, 1988 and April 22, 1988 from Deborah Kinburn of Hannoch Weisman for the referenced facility's aboveground hazardous waste storage tank OT-100. The closure plan was submitted in order to delist the tank and take it out of service. A public notice of the closure plan was issued and a public comment period of thirty (30) days was provided. However, no comments were received from the public concerning closure.

Based upon its review, the Department hereby approves the closure plan for tank OT-100. Closure of the subject storage area shall be conducted in accordance with N.J.A.C. 7:26-9.8, the February 1, 1988 and April 22, 1988 submittals, and also the following conditions:

1. Removal of all hazardous waste inventory from the tank for manifested disposal to an authorized facility must be done within 90 days of this approval.

2. Tank OT-100 and its associated piping shall be dismantled and disposed of off-site to an authorized hazardous waste disposal facility.

3. All hazardous waste generated during closure activities shall be manifested off-site to an authorized facility.

4. Soil sampling shall be completed within 90 days from the date of this approval, however, sampling shall not be conducted prior to the removal of all hazardous waste from the tank. The Department shall be notified at least two weeks prior to initiation of sampling so an auditor from the Department can be present during the sampling episode.

SEP 15 1988

Soil sampling activities shall be conducted in accordance with the approved plans dated February 1, 1988 and April 22, 1988 and the following conditions:

a. Soil samples shall be collected from locations specified in the plan. S-1, S-2 and S-3 shall be analyzed for total petroleum hydrocarbons at a depth of 0-6 inches and Target Compound List (TCL) +30 at a depth of 6-12 inches. S-3 shall also be analyzed for TCL VOA plus 10 fraction and total petroleum hydrocarbons at a depth of 18-24 inches. Any obviously stained soils shall be sampled independently of an in addition to other samples proposed. These samples shall be collected at a depth of 0-6 inches and be analyzed for TCL +30 and total petroleum hydrocarbons.

b. In addition, one trip blank to be analyzed for volatile organic parameters and one field blank to be analyzed for the same parameters as samples collected that day shall also be conducted.

c. The laboratory conducting the analysis must utilize CLP SOW for Organic and Inorganic Analysis or 3rd Edition SW-846 methodologies.

5. Soil sampling analytical results shall be submitted to the Department within 60 days from the date of sampling. The Department shall review the results and notify the facility of its findings regarding soil sample contamination. If the soil samples are found to be contaminated, Orbis shall be required to submit for the Department's approval a detailed delineation and cleanup plan for the contaminated areas within 60 days from notification. Upon approval of the plan, the facility shall have 30 days to begin implementation of delineation and cleanup procedures.

6. Closure activities shall be completed within 180 days from the date of this approval.

7. Written certification by the operator and an independent professional engineer registered in New Jersey shall be provided to the Department within 210 days from the date of this approval. The certification shall document that all closure activities have been carried out in accordance with the approved plan and conditions of this letter.

Be advised, a complete delisting of the facility can only occur after the aforementioned closure certification has been received and approved by the Department.

Orbis requested delistment of its container storage activity in letters to the EPA dated June 16, 1981 and February 8, 1983, and in letters to the Bureau of Hazardous Waste Engineering dated January 18, 1983, October 8, 1985 and November 6, 1987. Orbis based these requests on the fact that the facility never stored hazardous waste in containers for greater than 90 days, and only filed its Part A application as a protective filer. Based upon these requests and an affidavit dated April 27, 1988 attesting to these facts made by Albert Devigili, supervisor at the facility, Orbis' container storage activity is hereby delisted from "TSD" status and assigned

SEP 15 1988

"generator" status per compliance with N.J.A.C. 7:26-9.3(a) which is as follows:

1. All such waste is, within 90 days or less, shipped off-site to an authorized facility or placed in an on-site facility, as defined at N.J.A.C. 7:26-1.4.

2. The waste is placed in containers which meet the standards of N.J.A.C. 7:26-7.2 and are managed in accordance with N.J.A.C. 7:26-9.4(d).

3. The date upon which each period of accumulation begins is clearly marked and visible for inspection on each container. While being accumulated on-site, each container shall be clearly labeled or marked with the words "Hazardous Waste" and labeled in accordance with 49 CFR 172.304.

4. The generator complies with the the requirements for owners and operators of N.J.A.C. 7:26-9.6 and 9.7 concerning preparedness and prevention, contingency plans and emergency procedures as well as N.J.A.C. 7:26-9.4(g) concerning personnel training.

If you have any questions concerning these matters, please contact Anthony Fontana at (609) 292-9880.

Very truly yours,

Frank Coolick

Frank Coolick, Assistant Director
Hazardous Waste Regulation Element

EP63/abl
c: Barry Tornick, USEPA, Region II
Kathleen Miiller, BEMQA
Deborah Kinburn, Hannoch Weisman
Anthony Cavalier, MFO

DOCUMENT: ORBIS1
FOLDER: LXRMCB

## SPECIAL CONDITIONS FOR NJPDES/SIU PERMITS-BY-RULE

(a) All indirect dischargers which are not SIUs or which are not required by N.J.A.C. 7:14A-10.5(a) to obtain an individual NJPDES permit and which are authorized by the DTW pursuant to N.J.A.C. 7:14A-13.4(a) shall be deemed to possess a NJPDES permit-by-rule and must comply with the standards specified in (c) below.

(b) Termination of eligibility for a permit-by-rule.

1. Based upon non-compliance with (c) below, the Department may terminate the eligibility of any indirect discharger for a permit-by-rule. Where eligibility for a permit-by-rule has been terminated by the Department, the indirect discharger shall apply for and is required to obtain a NJPDES/SIU permit in accordance with N.J.A.C. 7:14A-10.5(c).

2. Whenever a DTW's-Pretreatment Program approval has been withdrawn based upon the criteria set forth in N.J.A.C. 7:14A-13.8, all SIUs discharging to the DTW will lose their eligibility for a permit-by-rule and will be required to obtain an individual NJPDES/SIU permit in accordance with N.J.A.C. 7:14A-10.1(h).

(c) Standards for NJPDES/SIU Permit-by-Rule. All indirect dischargers shall comply with the following:

1. Standards for prohibited discharges, see N.J.A.C. 7:14A-13.3(a)1;

2. Categorical pretreatment standards, see N.J.A.C. 7:14A-13.3(a)2;

3. DTW ordinances, rules and regulations which have been approved by the Department, see N.J.A.C. 7:14A-13.3(a)4;

4. Water quality violations, see N.J.A.C. 7:14A-13.6;

5. Sludge quality violations, see N.J.A.C. 7:14A-13.7; and

6. Any other standards promulgated by the Department under the Pretreatment Act or State Act.

WQM216:vk

REFERENCE NO. 10

STATE OF NEW JERSEY
DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT

DIVISION OF WATER POLICY
AND SUPPLY

# SPECIAL REPORT NO. 28

# GROUND-WATER RESOURCES OF ESSEX COUNTY, NEW JERSEY

Prepared in cooperation with
United States Department of the Interior
Geological Survey

1968

# GROUND-WATER RESOURCES OF ESSEX COUNTY, NEW JERSEY

By William D. Nichols

## ABSTRACT

Ground water in Essex County occurs in joints and fractures in consolidated rocks and in the voids of unconsolidated statified drift deposits. Wells in sandstone and shale of the Brunswick Formation of Triassic age yield from 35 to 820 gpm; the most productive water-bearing zones are commonly between depths of 300 to 400 feet. Drawdown due to pumping is greatest in the direction of strike of the formation (about N 30° E in Essex County) and least in the direction perpendicular to strike. Wells in the Watchung basalt, which is intercalated with rocks of the Brunswick Formation commonly yield small to moderate supplies but may occasionally yield up to 400 gpm. Large yields, ranging from 410 to 1,593 gpm, are common from wells tapping the stratified drift deposits in the western part of the county.

Quality of ground water is acceptable for most uses throughout the county. However, heavy pumpage in the Newark area has lowered water levels to more than 100 feet below sea level. The low water levels have reversed the natural gradient and induced the flow of salt water into the bedrock aquifer, seriously impairing ground-water quality there. Recent analyses of ground-water samples from Newark indicate that the chloride concentration in the aquifer has increased since the preliminary study of the problem by Herpers and Barksdale in 1951.

Highly productive stratified drift deposits are found primarily in that part of the county west of Second Watchung Mountain. They occur as valley-fill material in stream valleys cut into the underlying bedrock before the last glaciation. These deposits in Essex County are part of an extensive valley-fill aquifer system underlying the eastern Morris-western Essex County area. Water levels in these deposits in western Millburn Township have declined 36 feet since 1950, probably as a result of below normal rainfall for most of the period 1953 to 1966 together with constantly increasing pumpage throughout the area.

Withdrawals of ground water from all aquifers in Essex County for public supply averaged about 26 mgd (million gallons per day) in 1966. Pumpage for public supply from aquifers in unconsolidated sediments averaged 20.9 mgd, about 81 percent of the total from all aquifers.

Most of the productive aquifers in Essex County are currently being developed. Although the optimum potential of the stratified drift aquifers

*Population of Essex County 1900-60*

| | |
|---|---|
| 1900 | 359,053 |
| 1910 | 512,886 |
| 1920 | 652,089 |
| 1930 | 833,513 |
| 1940 | 837,340 |
| 1950 | 905,949 |
| 1960 | 923,545 |

Nearly 90 percent of the county's population is located in the 71.5 square miles (55.6 percent of total area) east of the Watchung Mountains.

The economy of Essex County is primarily industrial. The principal manufactured products include food products, electrical goods and machinery, chemicals, machinery (excluding electrical machinery), fabricated metal products, and apparel. In 1960, only about 5 percent of the total land area of the county was utilized as farmland.



# GEOLOGY

## INTRODUCTION

The Brunswick Formation and Watchung Basalt of the Newark Group of Late Triassic age underlie all of Essex County. The Brunswick Formation is dominantly shale and sandstone, but also includes minor amounts of conglomerate. The Watchung Basalt consists of three extensive sequences of lava flows intercalated with the shale and sandstone of the Brunswick Formation. The generalized bedrock geologic map (fig. 2) shows the areal extent of the rocks of Triassic age underlying Essex County. Overlying the rocks of the Newark Group are unconsolidated clay, sand, and gravel deposited during the Pleistocene and Recent Epochs. Pleistocene deposits are the most widespread and are found throughout the county. Deposits of Recent age are confined to the present-day stream valleys. Figure 3 shows the general distribution of the unconsolidated Pleistocene deposits.

Parts of Fairfield and Millburn Townships and Newark are underlain by valleys cut (fig. 3) in bedrock by streams that drained the area before the last glaciation. The valley were subsequently filled in and buried by glacial debris and have little present-day surface expression.

## DISTRIBUTION AND LITHOLOGY OF ROCK UNITS

### Consolidated Rocks

Rocks of the Brunswick Formation, the uppermost unit of the Newark Group, underlie most of Essex County. The formation consists dominantly of interbedded brown, reddish-brown, and gray shale, sandy shale, sandstone, and some conglomerate. Three sheets of gray to black basalt are intercalated with sandstone and shale beds of the Brunswick Formation. The total thickness of the Brunswick Formation is not known, but probably exceeds 6,000 feet (Kümmel 1940, p. 102).

In the southern part of the county east of the Watchung Mountains, the Brunswick Formation is predominantly a soft red shale. These rocks become coarser grained toward the north. In the northern part of the county the rocks are mostly sandstone and some interbedded shale; conglomerate is found in the extreme northern part of the county. This change from soft, easily weathered, shale to more resistant sandstone is reflected in the change of topography from the rather flat low-lying plain with few hills in southern Newark to hills of low relief in the northern part of the county.

Between First and Second Watchung Mountains, the Brunswick Formation is dominantly sandstone. West of Second Watchung Mountain, the formation is covered with thick deposits of unconsolidated sediments

of glacial origin and few outcrops can be found. As indicated from records of wells drilled in this area, the rocks are mainly shale and some interbedded sandstone.

Two prominent ridges, First and Second Watchung Mountains, extend from northeast to southwest across the county (fig. 2). These are the two lowest sequences of basalt flows of the Watchung Basalt. The third, uppermost, sequence of flows is represented by Ricker Hill in Livingston Township. These basalt sheets were formed by lava which was extruded at three different times during the accumulation of the sedimentary rocks of the formation. Each of these sheets is made up of several lava flows. Scoriaceous zones occur at the top of many of the individual flows. In some places, thin beds of shale occur between successive flows. The lower part of the Watchung Basalt, which comprises First Watchung Mountain, is from 600 to 650 feet thick; the Watchung Basalt in Second Watchung Mountain varies from 750 to 900 feet in thickness; the uppermost Watchung Basalt ranges from 225 to 350 feet in thickness (Darton and others, 1908, p. 10).

First and Second Watchung Mountains are parallel, and in places have double-crested ridges reflecting the presence of interbedded sedimentary rocks; the ridges generally rise between 300 and 400 feet above the adjacent country. The trend of the ridges reflect the general strike of the sedimentary rocks of the Brunswick Formation. The beds dip about 10 degrees toward the northwest.

## Pleistocene and Recent Deposits

Unconsolidated sediments deposited by glaciers or by glacial meltwater during the Pleistocene Epoch cover most areas of Essex County. These deposits can be divided roughly into several types. Unstratified drift called till or ground moraine is a heterogeneous mixture of clay, silt, sand, gravel, cobbles, and boulders which was deposited by the ice. Unstratified drift that has accumulated in a ridgelike deposit along the margin of a glacier is called an end moraine. Stratified drift is deposited by glacial meltwater in streams (glaciofluvial deposits) and lakes (glaciolacustrine deposits). Glaciofluvial deposits are generally stratified sand, and sand and gravel, and glaciolacustrine deposits are usually bedded or laminated silt and clay. Figure 3 is a map showing the generalized distribution of the Pleistocene deposits in Essex County.

Streams and rivers draining the Essex County area before the last glaciation cut deep valleys into the Triassic rocks (fig. 3). These valleys were subsequently buried by glacial debris, and the thickness of the glacial deposits is largely controlled by the underlying bedrock topography. The



altitude of the floor of the buried bedrock valley under the Newark area is as much as 280 feet below sea level (fig. 4), and the glacial drift is as much as 300 feet thick. In the southwestern corner of Essex County in Millburn Township, the altitude of the valley floor is 17 feet above sea level and the drift averages 150 feet in thickness. In the northwestern part of the county in Fairfield Township, the floor of the valley is as much as 35 feet below sea level and the drift has a maximum thickness of about 200 feet. In the areas between the valleys, where the bedrock surface is high, the drift ranges from 0 to 70 feet thick.

East of the Watchung Mountains and west of the buried valley under the Newark area, the glacial deposits consist dominantly of till. The valley under the Newark area, however, is filled largely with stratified drift and interbedded lenses of till. In the central and southern part of Newark the main valley (fig. 4) is filled with as much as 200 feet of lacustrine clay and sandy clay, which is overlain by 50 to 100 feet of other stratified or unstratified glacial drift. In the northern part of Newark, where the valley (fig. 4) parallels the Passaic River, the valley contains several deposits of sand and gravel interbedded with clay and till. The sand and gravel ranges from 1 to 19 feet in thickness and is encountered mostly at depths of less than 50 feet and depths of more than 220 feet below land surface.

The present-day valley between First and Second Watchung Mountains is underlain by approximately 100 feet of stratified drift in both Cedar Grove in the north and Millburn Township in the south. These deposits consist mostly of stratified sand and gravel. Their maximum thickness appears to occur under that part of the valley west of the Rahway and Peckman Rivers; east of the rivers, the bedrock surface is shallow (30 to 50 feet below the valley floor), and the unconsolidated deposits are thin. There are not enough data to define the thickness and character of the subsurface glacial deposits in the valley in Verona and most of West Orange.

West of Second Watchung Mountain, the stratigraphy of the glacial deposits is moderately complex, especially in the buried valleys. The drift in the main buried valley in Livingston and Millburn Townships (fig. 3) has a maximum thickness of about 170 feet and consists of interbedded sand, sand and gravel, clay and till. Thicknesses of sand and gravel outwash range from 20 to 80 feet. Farther north, in north-western Fairfield, the main buried valley (fig. 3) is filled with as much as 200 feet of drift consisting almost exclusively of 140 to 170 feet of laminated silt and clay underlain by 10 to 30 feet of till. Deposits of fine- to medium-grained sand ranging in thickness from 0 to 20 feet occur on the surface.

The tributary buried valleys in Fairfield Township (fig. 3) contain from 30 to 50 feet of silty sand, sand, and gravel overlain by clay and till near the confluence with the main buried valley. Where the bedrock surface is high, between buried valleys, the glacial deposits consist dominantly of till. However, some stratified sand and gravel are found in the subsurface in eastern Roseland and Essex Fells which do not occur as valley-fill deposits.

Unconsolidated sediments of Recent age are confined to areas adjacent to present-day streams. These deposits consist of clay, silt, and fine sand with gravel. (Rogers and others, 1957, p. 7).



# GROUND-WATER HYDROLOGY

## INTRODUCTION

Ground water is derived from that part of precipitation that does not run off the surface of the land to streams or return to the atmosphere through evaporation and transpiration. Factors which determine the amount of water that infiltrates to the ground-water reservoir include (1) the porosity and permeability of the surficial material, (2) the slope of the land, (3) the amount and kind of natural and artificial cover, and (4) the intensity and amount of precipitation.

The permeability of a rock, or its ability to transmit water, depends on its porosity, that is, on the number and size of the interstices and on the extent to which the interstices are interconnected. The porosity of a rock, in turn, depends largely on: "the shape and arrangement of its constituent particles, the degree of assortment of its particles, the cementation and compacting to which it has been subjected since its deposition, the removal of mineral matter through solution by percolating waters, and the fracturing of the rock, resulting in joints and other openings" (Meinzer, 1923, p. 3). Porosity is expressed quantitatively as the ratio between the volume of void to the total volume of the rock, that is, as the percentage of the total volume of rock occupied by interstices.

On the basis of the type of openings in which ground water may occur, the geologic formations in Essex County may be divided into two groups: (1) consolidated rocks of Triassic age, and (2) unconsolidated sediments of Pleistocene age.

The primary pore spaces in consolidated rocks of the Brunswick Formation in Essex County are commonly so small that an insignificant quantity of water, if any, moves through them under the natural hydraulic gradients or those established by pumping. However, a joint and fracture system that has developed in the consolidated rocks provides secondary porosity and it is largely in and through these openings that the storage and movement of ground water takes place. In addition, vesicles and scoriaceous zones in the basalt add to the porosity in these rocks. Limited interconnected void space occurs in sandstone beds where cementing material is lacking. The volume of all of these openings constitute only a very small percentage of the total volume of the Brunswick Formation and, consequently, their capacity to store and transmit water is limited.

In unconsolidated sediments, water occurs in the pore spaces between the constituent grains. The capacity of unconsolidated sand and gravel deposits to store and transmit water is commonly much greater than that of the consolidated rocks. The reason for this is that the ratio of the

volume of void to the total volume of unconsolidated sediment is considerably greater than the ratio of the volume of fracture openings to the total volume of rock. The interstitial openings in clays and silts are so small, however, that they restrict the movement of water, even though the percentage of void space may be great.

## WATER-BEARING PROPERTIES OF MAJOR GEOLOGIC UNITS

### Consolidated Rocks

Rocks of the Brunswick Formation are the main source of ground water in Essex County. The shales and sandstones are generally capable of sustaining moderate to large yields to wells. The Watchung basalt commonly is capable of yielding only small to moderate quantities of water.

Water in these rocks occurs under both unconfined and confined conditions. Unconfined ground water occurs mainly in the upland areas where overlying unconsolidated deposits are thin or absent. Confined and semiconfined ground water conditions exist in lowland areas in Newark, parts of Fairfield, and along the Passaic River where clay beds in the unconsolidated Quaternary deposits mantle the underlying rocks. Wherever such confinement occurs, water beneath the relatively impermeable confining layers is commonly under artesian pressure. In many areas, such as parts of Fairfield and in the northern part of the county, water in wells tapping the confined aquifers will rise above the top of the aquifer and sometimes near or above land surface. In areas subjected to heavy pumping, such as the Newark area and western Millburn Township, the artesian pressure may be considerably reduced. Parts of the confined aquifer may even become dewatered as has happened in part of Newark, in which case the water remaining in the aquifer is no longer confined.

Confined ground water is also encountered in the shales and sandstone directly beneath the basalt flows in the western part of the county downdip from the outcrop area. Confined or semiconfined ground-water conditions may occur in some areas because of differences in permeability within the rock layers resulting from variations in fracturing or weathering or a combination of both.

Some of the various systems of joints and fractures in the consolidated rocks intersect so that water can move vertically as well as horizontally and zones of high secondary porosity are then interconnected. Most wells tapping these rocks draw water from more than one water-bearing zone. However, these zones in the Brunswick Formation have not yet been accurately defined. They are certainly within the first 600 feet below land surface, and for most practical purposes are probably within the first 400 feet. The best producing wells in the Brunswick Formation in



Essex County are for the most part between 300 and 400 feet deep. Nevertheless, the lack of any precise known boundaries makes it difficult to determine the optimum depth to which a well should be drilled in any given location. Also it is impossible to predict the yield of a proposed well except in very general terms based on the average yield of other wells in the area.

Two pumping tests, both at the same locality, were conducted by the U. S. Geological Survey in January 1949 on wells tapping the Brunswick Formation in Essex County. The wells (owned by P. Ballantine and Sons, Newark), shown on figure 5, were selected to provide the best possible spread of observation wells in as many directions as possible. As the results of the tests have been reported by Herpers and Barksdale (1951, p. 28-31) they will be only summarized here.

In the first test, the centrally located well I-1 was pumped and water levels were observed in the seven surrounding wells indicated on figure 5. Well II-9 was pumped during the second test and the same wells were used to observe water levels. In both tests, observation wells lying along the strike of the Brunswick Formation with respect to the pumping well showed the greatest drawdown. When well I-1 was pumped, there was a prompt and distinct decline of the water level in observation well II-8. When well II-9 was pumped, the water level in observation well II-10 responded promptly and distinctly. No significant response was seen in observation wells aligned in directions other than along the strike during either test.

In these tests, as well as in several others conducted, it is invariably noted that aquifers in the sedimentary rocks of Triassic age of northern New Jersey are anisotropic, that is, they do not transmit water equally in all directions (Vecchioli, 1967). The greatest drawdowns are observed in those wells aligned along the strike of the sedimentary layers with respect to the pumping well. The least amount of drawdown is observed in observation wells that are located transverse to the strike. These observations have been interpreted to indicate that water moves more readily along joints and fractures which strike parallel to the strike of the bedding than along joints and fractures which strike in other directions. It is useful, when planning future well locations, to know the direction in which wells will interfere most with each other and with existing wells. In general, wells should be spaced far apart along the direction of strike (approximately N 30° E for most of Essex County) because it is in this direction that the greatest interference occurs. They may be placed closer together perpendicular to the strike since interference is less in that direction.

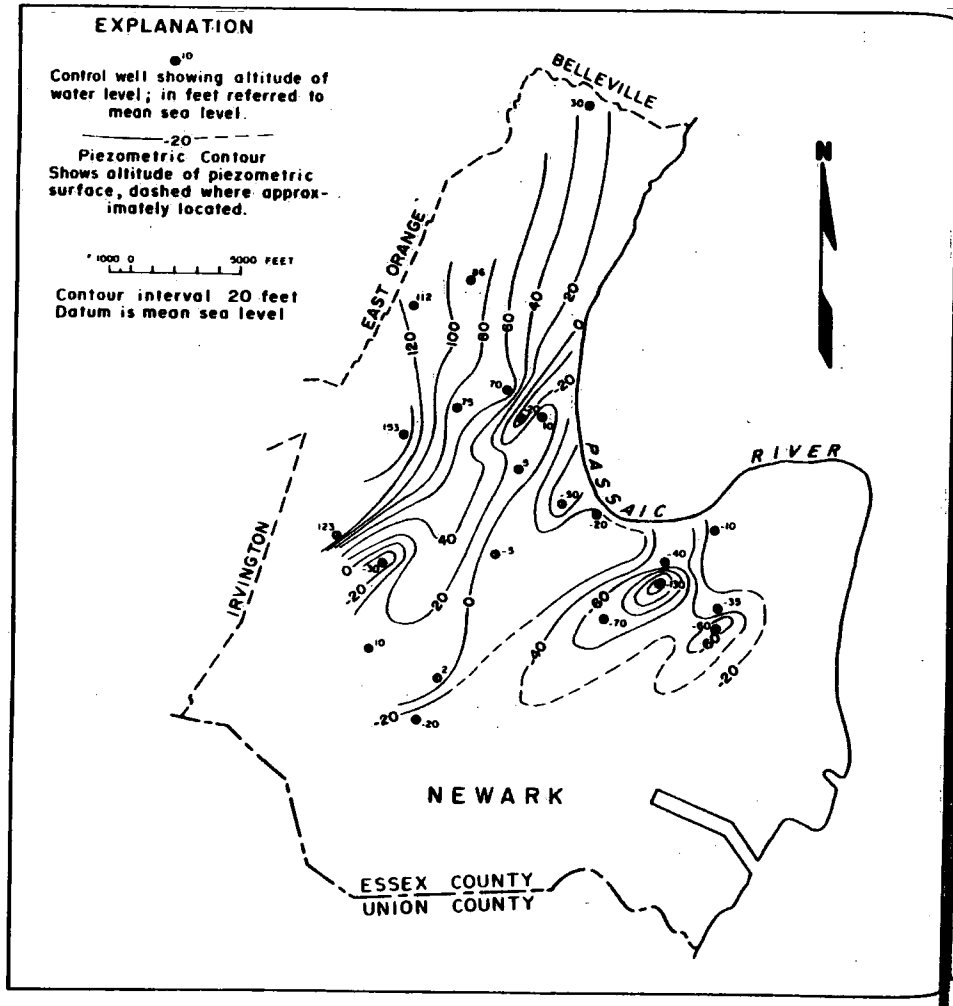


*Figure 9.—Generalized piezometric contours for the Brunswick Formation in the Newark area based on water levels in wells drilled between 1890 and 1900.*



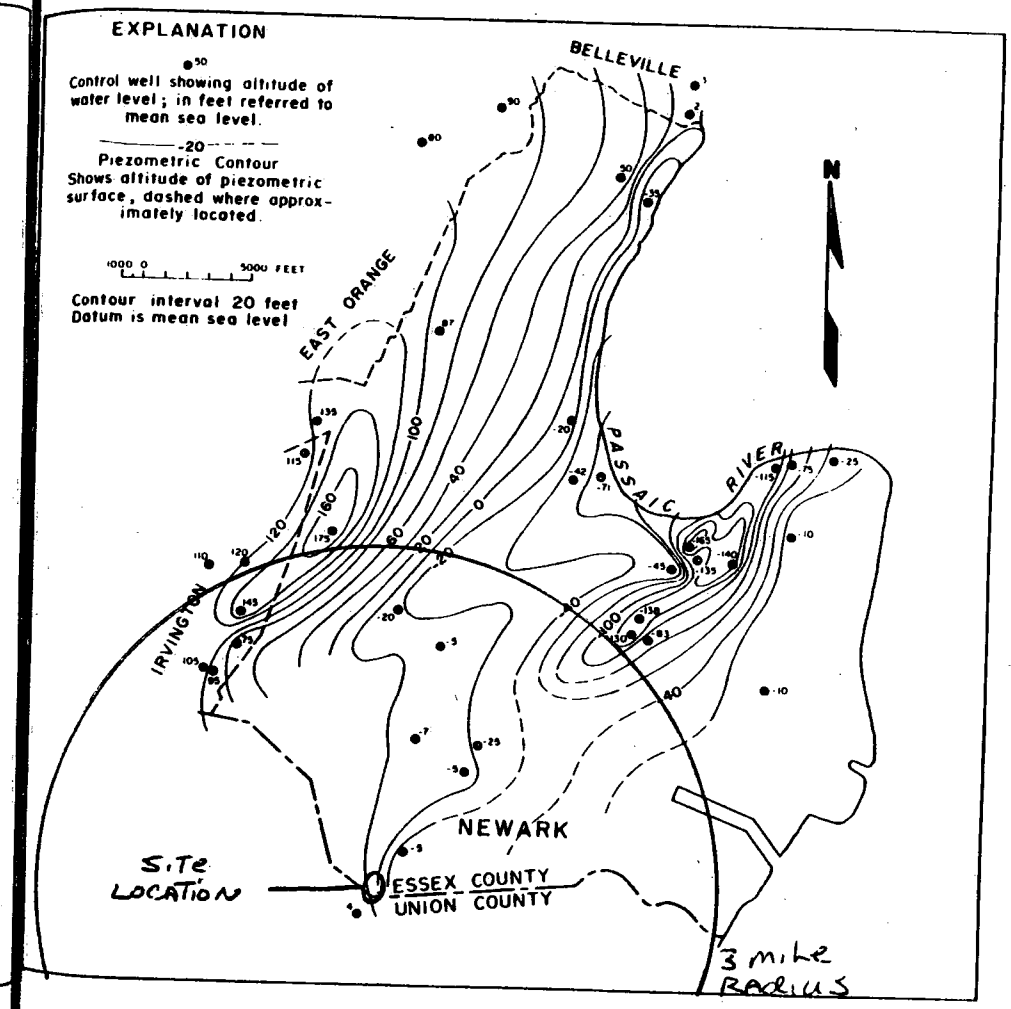


*Figure 10.—Generalized piezometric contours for the Brunswick Formation in the Newark area based on water levels in wells drilled between 1950 and 1960.*

Salt-water contamination of the Brunswick Formation in the Newark area has been investigated by Herpers and Barksdale (1951). Their study was based on analyses of water samples collected in 1942 by the city of Newark. More recent analyses suggest there has been additional encroachment of saline water since 1942 throughout the problem area. In 1942, water from the Wilbur Driver Company's well No. 2 along the Passaic River in northern Newark contained 72 ppm chloride. In 1961, water from this same well contained 330 ppm chloride. Water from a well drilled by Mutual Benefit Life Insurance Company, 520 Broad Street, in 1965 contained 1,145 ppm chloride. Samples collected from other wells in this area contained less than 500 ppm chloride in 1942.

## Pleistocene Deposits

Unconsolidated sediments of Pleistocene age mantle the bedrock throughout much of Essex County (fig. 3). They consist of clay, silt, sand, gravel, and boulders and can be divided into two general categories—stratified drift and unstratified drift. Only sand and gravel aquifers in stratified drift deposits contain sufficient quantities of water to warrant discussion of their water-bearing properties.

Water in the stratified drift occurs under both unconfined (water table) and confined (artesian) conditions. Unconfined ground water occurs where sand and gravel deposits are not covered by clay, silt, or glacial till and are exposed at the surface. The distribution of these deposits is shown on figure 3. For the most part however, these sand and gravel deposits do not yield large quantities of water as they are commonly less than 20 feet thick and are not areally extensive. The unconfined aquifers are recharged directly from precipitation on the outcrop area. Confined and semiconfined ground water occurs where sand and gravel deposits have been covered by lake clay or silt, or by glacial till. These deposits are largely confined to the buried valley so they are not visible on the surface and their regional extent and distribution are therefore not readily apparent. The confined and semiconfined aquifers are recharged by leakage through overlying confining beds and by precipitation falling on outcrop areas outside Essex County. Some recharge may also be derived from the underlying and adjacent Brunswick Formation.

The most productive artesian and semi-artesian aquifers in the stratified drift in Essex County occur as valley fill in stream valleys that were cut in the bedrock before the last glaciation. Consequently the size, shape, and distribution of the aquifers conform to the size, shape, and distribution of the bedrock valleys. The bedrock valley underlying the Newark area (shown on fig. 4) is filled with till and clay, and contains only minor amounts of water-bearing sand. Extensive subsurface exploration in western

Aquifer name:
Qsd, Stratified drift
TRb, Brunswick Formation
TRwb, Watchung Basalt

## TABLE 2.—RECORDS OF SELECTED WELLS IN ESSEX COUNTY, N. J.—Continued

Remarks:
O.W., Owners well number

| Well | Owner or Tenant | Driller | Date Drilled | Altitude above mean sea level (ft) | Total depth drilled below land surface (ft) | Diameter of well (inches) | Depth to which well is cased (ft) | Screen setting (ft) | Aquifer | Static level below land surface (feet) | Yield (gpm) | Drawdown (ft) | Specific capacity (gpm/ft) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | FAIRFIELD BOROUGH | | | | | | | | | |
| 1 | Fairfield Borough | W. Beatty | 1962 | --- | 90 | 8 | 79 | 79-90 | Qsd | --- | 350 | --- | -- | |
| 2 | Republic Tool & Mfg. Co. | Algeier Bros. | 7-30-52 | 170 | 53 | 6 | 53 | --- | Qsd | 2 | 40 | 8 | 5.00 | |
| 3 | Curtiss Wright Corp. | Artesian Well & Equip. Co. | 1941 | 170 | 560 | 10 | --- | none | TRwb | 11 | 155 | 136 | 1.14 | O.W.4 |
| 4 | Fairfield Borough | H. A. Kieffer | 12-26-53 | 170 | 185 | 6 | 83 | none | TRb | 20 | 36 | 20 | 1.80 | O.W.1 |
| 5 | Fairfield Borough | Burrows Well Drilling Co. | 7- 9-64 | 167 | 350 | 10 | 85 | none | TRb | --4 | 500 | 64 | 7.35 | |
| 6 | De Witt Rubber Mfg. Co. | Algeier Bros. | 7-16-54 | 170 | 142 | 6 | 86 | none | TRb | 2 | 25 | 13 | 1.92 | |
| 7 | Curtiss Wright Corp. | Artesian Well & Equip. Co. | 4- 5-43 | 175 | 490 | 10 | --- | none | TRwb | 32 | 275 | 85 | 3.24 | O.W.6 |
| 8 | Industry Publications | Algeier Bros. | 9-15-54 | 180 | 100 | 6 | 57 | none | TRwb | 15 | 15 | 10 | 1.5 | |
| 9 | Williamson & Co., Inc. | H. A. Kieffer | 5-15-53 | 190 | 510 | 6 | 74 | none | TRwb | 13 | 25 | 55 | .45 | |
| 10 | Green Brook Country Club | H. A. Kieffer | 1958 | --- | 300 | 8 | 53 | none | TRb & TRwb | 20 | 335 | 28 | 11.96 | O.W.4 |
| | | | | | GLEN RIDGE BOROUGH | | | | | | | | | |
| 1 | S. Mendelsohn | Wm. Stothoff Co., Inc. | 1-12-51 | 240 | 166 | 6 | 22 | none | TRb | 45 | 30 | 3 | 10.00 | |
| 2 | Chicle Products Co. | ---------- | 1920 | --- | 757 | 6 | 110 | none | TRb | 18 | 50 | 52 | .96 | |
| | | | | | IRVINGTON (TOWN) | | | | | | | | | |
| 1 | Fezem Memorial Home | Wm. Stothoff Co., Inc. | 5-19-52 | 185 | 304 | 8 | 66 | none | TRb | 75 | 78 | 25 | 3.1 | |
| 2 | Kles Diner, Inc. | Parkhurst Well & Pump Co. | 3-10-55 | --- | 250 | 8 | 47 | none | TRb | 31 | 65 | 69 | .94 | |
| 3 | American Stores | Parkhurst Well & Pump Co. | 7-17-51 | 160 | 402 | 8 | 45 | none | TRb | 40 | 126 | 80 | 1.57 | O.W.1 |
| 4 | Olympic Park | A. J. Connally, Inc. | 1928 | 158 | 300 | 10 | --- | none | TRb | 52 | 420 | 78 | 5.38 | |
| 5 | Irvington Smelting & Refining Works | Wm. Stothoff Co., Inc. | 3-25-53 | --- | 304 | 10 | 62 | none | TRb | 40 | 300 | 22 | 13.6 | |
| 6 | Jersey Plastic & Die Casting Co. | Wm. Stothoff Co., Inc. | 3-26-54 | 155 | 400 | 10 | 38 | none | TRb | 94 | 183 | 106 | 1.74 | |
| 7 | Gallo Asphalt Co. | F. J. Bott | 6- 9-61 | 150 | 201 | 6 | 107 | none | TRb | 46 | 200 | 24 | 8.3 | |
| 8 | Palnut Co. | Parkhurst Well & Pump Co. | 1-27-50 | 170 | 229 | 8 | 80 | none | TRb | 45 | 60 | 6 | 10.0 | |

Aquifer name:
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TABLE 2.—RECORDS OF SELECTED WELLS IN ESSEX COUNTY, N. J.—Continued

Remarks:
O.W., Owners well number

| Well | Owner or Tenant | Driller | Date Drilled | Altitude above mean sea level (ft) | Total depth drilled below land surface (ft) | Diameter of well (inches) | Depth to which well is cased (ft) | Screen setting (ft) | Aquifer | Static level below land surface (feet) | Yield (gpm) | Drawdown (ft) | Specific capacity (gpm/ft) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MONTCLAIR (TOWN) | | | | | | | | | |
| 1 | Rapt & Ruden | Parkhurst Well & Pump Co. | 4-29-48 | 360 | 250 | 10 | 23 | none | TRb | 5 | 145 | 180 | .81 | |
| 2 | Bond's Ice Cream, Inc. | Parkhurst Well & Pump Co. | 3-10-50 | 510 | 157 | 8 | 21 | none | TRb | 15 | 150 | 55 | 2.73 | |
| 3 | Town of Montclair | ---------- | 1966 | --- | 300 | 10 | 41 | none | TRb | 24 | 950 | 51 | 18.62 | |
| 4 | Hahne & Co. | Parkhurst Well & Pump Co. | 8- 9-49 | 280 | 350 | 8 | 31 | none | TRb | 18 | 350 | 182 | 1.92 | O.W.2 |
| 5 | M. Quadrel | Burrows Well Drilling Co. | June, 1955 | 260 | 151 | 6 | 18 | none | TRb | 33 | 75 | --- | ---- | |
| 6 | Montclair Auto Minit Man | Rinbrand Well Drilling Co. | 1-10-50 | --- | 200 | 6 | 16 | none | TRb | 40 | 60 | --- | ---- | |
| | | | | | NEWARK (CITY) | | | | | | | | | |
| 1 | Aluminum Finishing Co. | J. Foster | 7-20-53 | 50 | 150 | 6 | 55 | none | TRb | 30 | 100 | 30 | 3.33 | |
| 2 | Wilbur B. Driver Co. | Rinbrand Well Drilling Co. | 7- 2-53 | 15 | 400 | 10 | 93 | none | TRb | 45 | 240 | 155 | 1.55 | O.W.5 |
| 3 | Pittsburgh Plate Glass Co. | Lauman & Co. | 1940 | 12 | --- | 12 | 90 | none | TRb | 9 | 390 | --- | ---- | |
| 4 | Mc Evoy Court Apartments | Parkhurst Well & Pump Co. | Oct. 1939 | 200 | 206 | 6 | 35 | none | TRb | 84 | 60 | 106 | .57 | |
| 5 | Columbia Theaters, Inc. | Wm. Stothoff Co., Inc. | 6- 9-53 | --- | 312 | 8 | 26 | none | TRb | 20 | 140 | 32 | 4.38 | |
| 6 | Pabst Brewing Co., Inc. | Artesian Well & Equip. Co. | 3-14-49 | 190 | 685 | 14 | 39 | none | TRb | 59 | 557 | 67 | 8.31 | O.W.4 |
| 7 | Pabst Brewing Co., Inc. | Artesian Well & Equip. Co. | 7-17-50 | 185 | 687 | 14 | 55 | none | TRb | 108 | 240 | 120 | 2.00 | O.W.5 |
| 8 | Newark Milk & Cream Co. | Rinbrand Well Drilling Co. | Feb. 1949 | 25 | 700 | 10 | 80 | none | TRb | 60 | 75 | 190 | .39 | |
| 9 | Continental Ins. Co. | S. P. D'Alessio | July 1965 | --- | 300 | 8 | 58 | none | TRb | 77 | 85 | 72 | 1.18 | |
| 10 | Newark Center Corp. | Garden State Artesian Well & Pump Co. | 2-18-55 | --- | 700 | 10-6 | 150 | none | TRb | 81 | 89 | 144 | .62 | O.W.1 |
| 11 | Kolker Chemical Works | Wm. Stothoff Co., Inc. | 12-11-51 | 12 | 802 | 12 | 127 | none | TRb | 117 | 600 | 43 | 13.95 | O.W.2 |
| 12 | Kolker Chemical Works | Wm. Stothoff Co., Inc. | 4-27-49 | 8 | 359 | 10 | 98 | none | TRb | 76 | 300 | 22 | 13.63 | O.W.1 |
| 13 | Eureka Construction Co. | Rinbrand Well Drilling Co. | 1-23-59 | 10 | 500 | 8 | 90 | none | TRb | 25 | 75 | 225 | .33 | |
| 14 | P. Ballentine & Sons | ---------- | 1937 | 12 | 875 | 16 | 95 | none | TRb | 227 | 375 | 153 | 1.79 | O.W.8, Plant #2 |

Aquifer name:
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## TABLE 2.—RECORDS OF SELECTED WELLS IN ESSEX COUNTY, N. J.—Continued

Remarks:
O.W., Owners well number

| Well | Owner or Tenant | Driller | Date Drilled | Altitude above mean sea level (ft) | Total depth drilled below land surface (ft) | Diameter of well (inches) | Depth to which well is cased (ft) | Screen setting (ft) | Aquifer | Static level below land surface (feet) | Yield (gpm) | Drawdown (ft) | Specific capacity (gpm/ft) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | NEWARK (CITY) - Continued | | | | | | | | | |
| 15 | Celanese Corp. of Amer. | P. H. & J. Colan | 1924 | 12 | 805 | 16-10 | 95 | none | TRb | 176 | 400 | 28 | 14.29 | O.W. 26 |
| 16 | Celanese Corp. of Amer. | Layne-New York Co. | 5-16-47 | 14 | 856 | 16-10 | 75 | none | TRb | 147 | 778 | 40 | 19.45 | O.W. 27 |
| 17 | J. Hensler Brewing Co. | P. Chaffitelli | 12-14-49 | 12 | 700 | 10-8 | 57 | none | TRb | 60 | 450 | 240 | 1.79 | O.W. 4 |
| 18 | Synthetic Plastics Co. | Industrial Well & Pump Co. | 1-15-63 | 14 | 600 | 8 | 145 | none | TRb | 150 | 300 | 110 | 2.73 | O.W. 1 |
| 19 | Ablon Finishes, Inc. | Frank Bott | 7-12-60 | 15 | 500 | 8 | 86 | none | TRb | 30 | 360 | 70 | 5.14 | |
| 20 | Cotan Corporation | ------- | 1930 | 10 | 290 | 8 | --- | none | TRb | 140 | 160 | 95 | 1.59 | |
| 21 | Universal Grain Co. | Wm. Stothoff Co., Inc. | 10-18-51 | 10 | 303 | 8 | 79 | none | TRb | 143 | 200 | 53 | 3.77 | |
| 22 | Mother's Food Products, Inc. | --------- | 1959 | 11 | 400 | 8 | 107 | none | TRb | 94 | 125 | 8 | 15.62 | |
| 23 | Kar Auto Service Co. | P. Chaffitelli | 2- 8-50 | 208 | 300 | 6 | 35 | none | TRb | 23 | 60 | 104 | .58 | |
| 24 | Food Fair Stores | Burrows Well Drilling Co. | April, 1955 | 100 | 298 | 8 | 35 | none | TRb | 105 | 250 | 45 | 5.56 | |
| 25 | S. & S. Super Service Corp. | Rinbrand Well Drilling Co. | 2-18-50 | 50 | 190 | 6 | 94 | none | TRb | 45 | 20 | --- | ---- | |
| 26 | Rutherford & Delaney Holding Co. | Garden State Artesian Well & Pump Co. | 7-31-56 | --- | 220 | 8-6 | 42 | none | TRb | 22 | 100 | 73 | 1.37 | O.W. 1 |
| 27 | Linde Air Products Co. | Artesian Well & Equip. Co. | July, 1954 | 10 | 500 | 12 | 44 | none | TRb | 17 | 124 | 190 | .65 | |
| 28 | C-O Two Fire Equipment Co. | Parkhurst Well & Pump Co. | 4-27-50 | 10 | 603 | 10 | 127 | none | TRb | 35 | 89 | 215 | .41 | |
| 29 | Suburban Motor Lodge, Inc. | Rinbrand Well Drilling Co. | June, 1950 | 10 | 555 | 8 | 126 | none | TRb | 15 | 20 | 235 | .08 | |
| 30 | S. B. Penick & Co. | Wm. Stothoff Co., Inc. | 6- 7-61 | --- | 400 | 10 | 75 | none | TRb | 60 | 644 | 23 | 28.00 | O.W. 2 |
| | | | | | NORTH CALDWELL BOROUGH | | | | | | | | | |
| 1 | Green Brook Country Club | H. A. Kieffer | July, 1951 | 310 | 300 | 8 | 33 | none | TRwb | 2 | 25 | 81 | .31 | O.W. 3 |
| 2 | Green Brook Country Club | H. A. Kieffer | March, 1925 | 290 | 301 | 8 | --- | none | TRb & TRwb | flowing 25 gpm | 60 | --- | ---- | O.W. 1. Redrilled 1962 |
| 3 | A. Struss | H. A. Kieffer | 8-16-55 | --- | 182 | 6 | 42 | none | TRwb | 65 | 25 | 5 | 5.00 | |
| 4 | A. F. Leitner | Algeier Bros. | 5-24-58 | --- | 195 | 6 | 25 | none | TRwb | 25 | 7 | 125 | .05 | |

Aquifer name:
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## TABLE 3.—CHEMICAL ANALYSES OF WATER FROM SELECTED WELLS IN ESSEX COUNTY

(Results in parts per million except as indicated)

(1) I, industrial
P.S., public suppl.

| Location no. on map | Owner and well number | Water-bearing formation | Date of collection | Temperature (°F) | Silica ($SiO_2$) | Iron (Fe) | Manganese (Mn) | Calcium (Ca) | Magnesium (Mg) | Sodium (Na) | Potassium (K) | Bicarbonate ($HCO_3$) | Sulfate ($SO_4$) | Chloride (Cl) | Fluoride (F) | Nitrate ($NO_3$) | Dissolved solids | Hardness as $CaCO_3$: Calcium, magnesium | Hardness as $CaCO_3$: Noncarbonate | Specific conductance (micromhos at 25°C) | pH | Color | Source of analysis | Use |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ESSEX FELLS BOROUGH | | | | | | | | | | | | | |
| 1 | Boro. of Essex Fells, No. 8 | TRwb | 9- 1-66 | 53 | 25 | .09 | .00 | 32 | 6.9 | 14 | .3 | 84 | 36 | 19 | .0 | 6.3 | 192 | 109 | 40 | 281 | 7.6 | 2 | U.S.G.S. | P.S. |
| 4 | Boro. of Essex Fells, No. 1 | Qsd | 9- 1-66 | 52 | 27 | .02 | .00 | 42 | 16 | 7.2 | .5 | 122 | 40 | 28 | .0 | 6.4 | 265 | 171 | 71 | 358 | 8.1 | 3 | U.S.G.S. | P.S. |
| | | | | | | | | | | | LIVINGSTON TOWNSHIP | | | | | | | | | | | | | |
| 5 | Livingston Twp. No. 1 | TRb | 2-25-59 | --- | --- | --- | --- | --- | --- | 6.7 | --- | 127 | 26 | 8.5 | --- | 9.6 | --- | 104 | 32 | 299 | 7.8 | 2 | U.S.G.S. | P.S. |
| 15 | Livingston Twp. No. 4 | TRb | 8-31-66 | 55 | 23 | .00 | .00 | 32 | 14 | 8.7 | .7 | 124 | 31 | 13 | .0 | 8.4 | 220 | 138 | 36 | 306 | 7.8 | 2 | U.S.G.S. | P.S. |
| 18 | City of East Orange | Qsd | 8-18-66 | --- | 19 | .14 | .00 | 52 | 20 | 13 | .8 | 166 | 7.8 | 9.4 | .1 | 6.1 | 309 | 212 | 76 | 433 | 7.5 | 2 | U.S.G.S. | P.S. |
| 22 | City of East Orange | TRb | 8-18-66 | --- | 24 | .10 | .00 | 34 | 13 | 8.7 | .7 | 140 | 25 | 6.7 | .0 | 3.8 | 191 | 139 | 24 | 288 | 7.4 | --- | U.S.G.S. | P.S. |
| | | | | | | | | | | | MILLBURN TOWNSHIP | | | | | | | | | | | | | |
| 3 | Commonwealth Wtr. Co. No. 49 | Qsd | 8-19-66 | 53 | 20 | .00 | .00 | 53 | 14 | 13 | .8 | 155 | 67 | 13 | .0 | 6.1 | 298 | 190 | 63 | 407 | 8.1 | 2 | U.S.G.S. | P.S. |
| 9 | Commonwealth Wtr. Co. No. 5 | Qsd | 8-19-66 | 54 | 21 | .10 | .00 | 44 | 15 | 12 | .8 | 164 | 40 | 10 | .0 | 1.1 | 240 | 172 | 37 | 368 | 7.6 | 2 | U.S.G.S. | P.S. |
| 11 | Commonwealth Wtr. Co., E | Qsd | 2-24-59 | 53 | 22 | .00 | .00 | 40 | 13 | 19 | .8 | 124 | 77 | 7.7 | .0 | 1.2 | 256 | 104 | 52 | 242 | 7.9 | 3 | U.S.G.S. | P.S. |
| 13 | Commonwealth Wtr. Co. No. 46 | Qsd | 8-19-66 | 53 | 20 | .04 | .10 | 40 | 10 | 23 | .4 | 158 | 47 | 11 | .1 | 0.6 | 240 | 141 | 12 | 306 | 7.6 | 3 | U.S.G.S. | P.S. |
| 19 | City of East Orange | Qsd | 8-18-66 | --- | 25 | .03 | .00 | 50 | 13 | 3.6 | 1.8 | 158 | 32 | 15 | .0 | 2.5 | 256 | 179 | 49 | 447 | 8.0 | 2 | U.S.G.S. | P.S. |
| 26 | City of Orange, No. 1 | Qsd | 2-24-59 | --- | --- | --- | --- | -- | --- | 5.2 | | 55 | 33 | 11 | --- | 1.1 | --- | 45 | 39 | 203 | 7.9 | 2 | U.S.G.S. | P.S. |
| | | | | | | | | | | | NEWARK (CITY) | | | | | | | | | | | | | |
| 14 | P. Ballentine & Sons | TRb | 1- 9-48 | 59 | 31 | .15 | --- | 865 | 173 | 447 | 7.0 | 210 | 911 | 1900 | .0 | 6.2 | 4780 | -- | | 6960 | 7.4 | 0 | U.S.G.S. | I |
| 17 | Heinler Brewing Co. | TRb | 10-18-37 | -- | -- | --- | --- | 152 | 31 | --- | --- | 162 | 240 | 12 | --- | --- | --- | --- | -- | - | - | - | U.S.G.S. | I |
| | | | | | | | | | | | SOUTH ORANGE (VILLAGE) | | | | | | | | | | | | | |
| 2 | City of South Orange, No. 2 | TRb | 2-24-59 | --- | 19 | .06 | .00 | 80 | 7.4 | 23 | 2.0 | 198 | 76 | 35 | .0 | 8.6 | 343 | 162 | 68 | 486 | 7.9 | 1 | U.S.G.S. | P.S. |
| 3 | City of South Orange, No. 3 | TRb | 9- 2-66 | 54 | 17 | .08 | .00 | 93 | 10 | 40 | 2.6 | 204 | 51 | 92 | .0 | 4.9 | 459 | 274 | 106 | 705 | 7.9 | - | U.S.G.S. | P.S. |

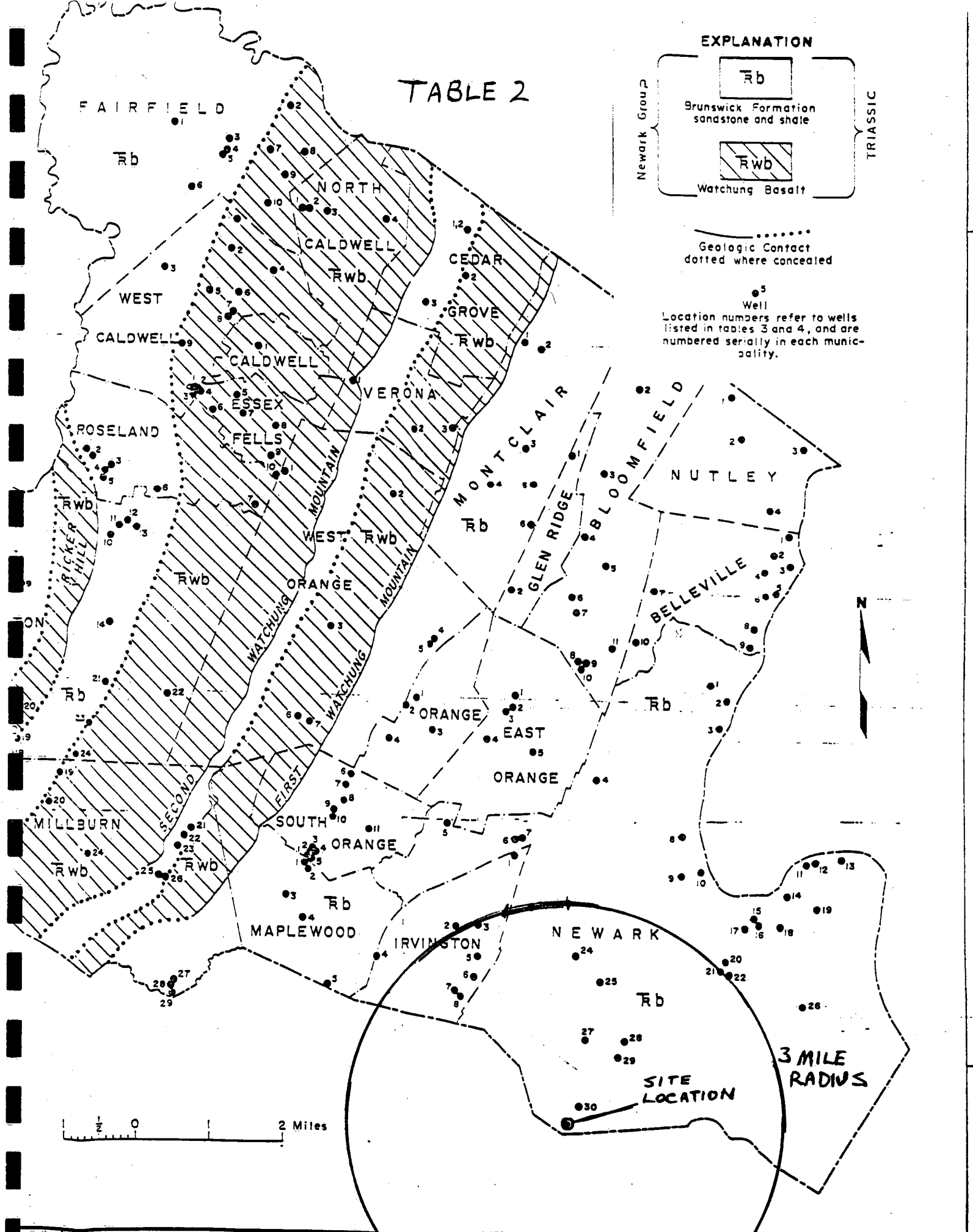



*Figure 2.—Generalized bedrock geologic map of Essex County, N. J. showing locations of selected wells.*

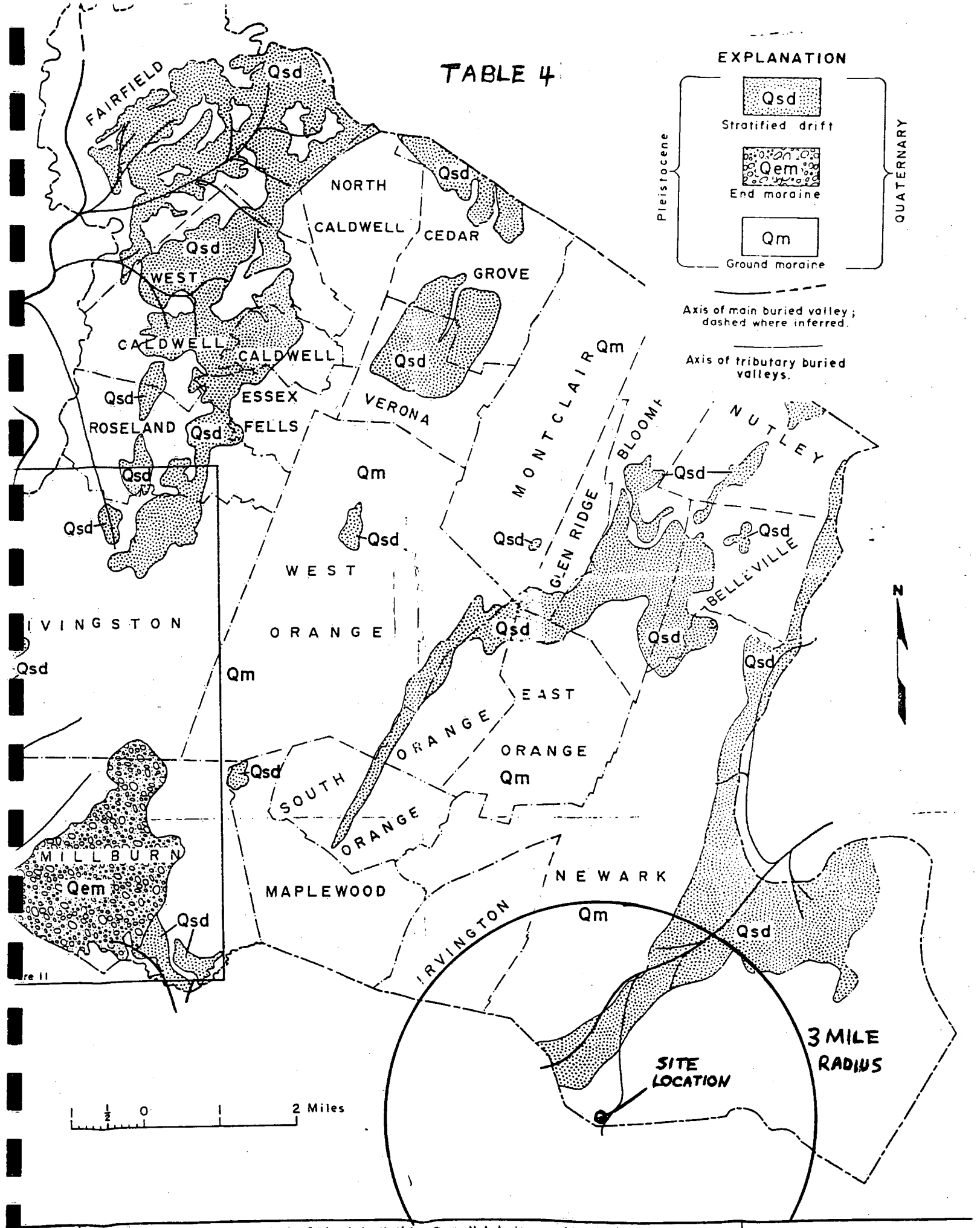



Figure 3.—Generalized surficial geologic map of Essex County, N. J. showing axes of buried valleys.

REFERENCE NO. 11

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

# BEDROCK TOPOGRAPHY AND THICKNESS OF PLEISTOCENE DEPOSITS IN UNION COUNTY AND ADJACENT AREAS, NEW JERSEY

By Bronius Nemickas

SCALE 1:24 000

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVALS 10 AND 20 FEET

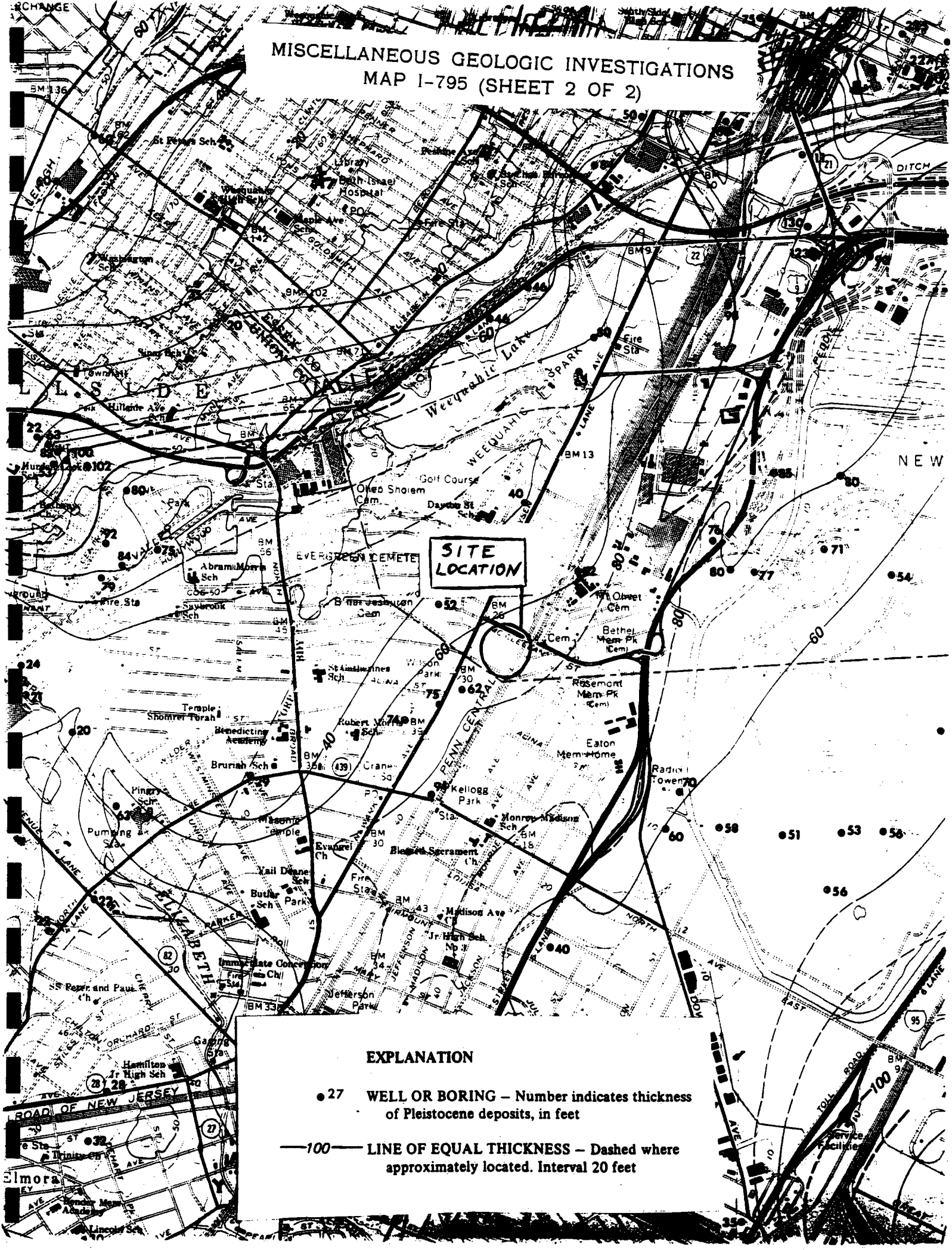
DEPTH CURVE AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER

SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER

THE MEAN RANGE OF TIDE IS APPROXIMATELY 5.3 FEET

MISCELLANEOUS GEOLOGIC INVESTIGATIONS MAP
Published by the U.S. Geological Survey, 1974
Washington, D.C. 20244

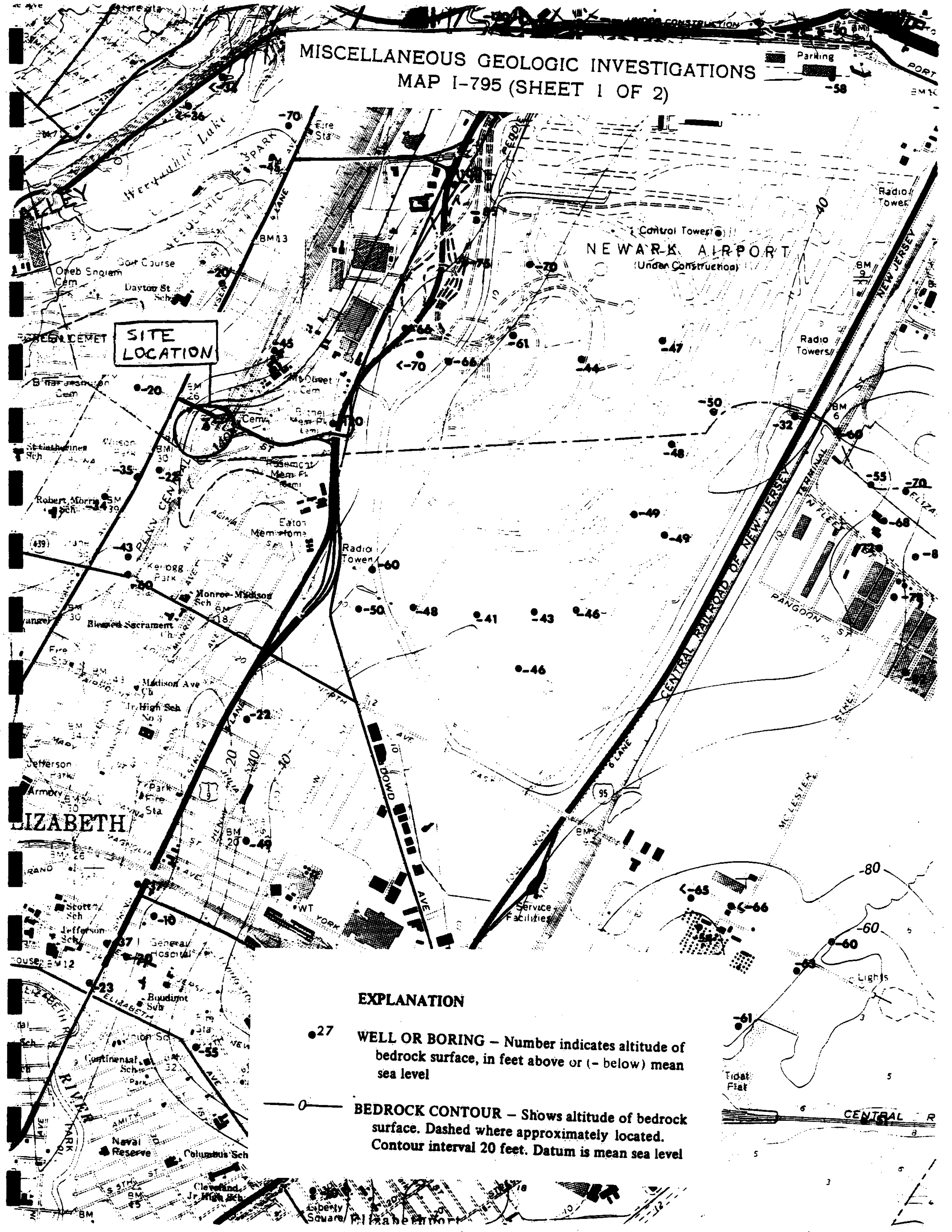
# MISCELLANEOUS GEOLOGIC INVESTIGATIONS MAP I-795 (SHEET 2 OF 2)




**EXPLANATION**

●27 **WELL OR BORING** – Number indicates thickness of Pleistocene deposits, in feet

—100— **LINE OF EQUAL THICKNESS** – Dashed where approximately located. Interval 20 feet



MISCELLANEOUS GEOLOGIC INVESTIGATIONS
MAP I-795 (SHEET 1 OF 2)
SITE LOCATION
NEWARK AIRPORT
(Under Construction)
Control Tower
Radio Tower
Radio Towers
CENTRAL RAILROAD OF NEW JERSEY
NEW JERSEY
ELIZABETH
Weequahic Lake
Golf Course
Parking
Service Facilities
Tidal Flat
PANGOON ST
MC LESTER
EXPLANATION
27
WELL OR BORING – Number indicates altitude of bedrock surface, in feet above or (– below) mean sea level
0
BEDROCK CONTOUR – Shows altitude of bedrock surface. Dashed where approximately located. Contour interval 20 feet. Datum is mean sea level

REFERENCE NO. 12

**NUS CORPORATION** TELECON NOTE

| CONTROL NO: | DATE: | TIME: |
|---|---|---|
| 02-8905-06 | 6/12/89 | 1102 |

DISTRIBUTION:

ORBIS PRODUCTS

| BETWEEN: | OF: | PHONE: |
|---|---|---|
| DREW BARIS | EPA REGION 2 - OFFICE OF GROUNDWATER MANAGEMENT | (212) 264 5635 |

AND: PAUL BAUER (NUS)

DISCUSSION:

MR. BARIS TOLD ME THERE IS NO ~~A~~ PE SOLE SOURCE AQUIFERS WITHIN 3 miles OF THE TOWN OF ELIZABETH, N.J., OR THE NEWARK AIRPORT.

Paul Bauer

ACTION ITEMS:

NUS 067 REVISED 0581

REFERENCE NO. 13

**NUS CORPORATION** TELECON NOTE

| CONTROL NO: | DATE: | TIME: |
|---|---|---|
| 02-8904-27 | 5-15-89 | 1126 |

DISTRIBUTION:
TO FILE - CELLOFILM CORPORATION

| BETWEEN: | OF: | PHONE: |
|---|---|---|
| DREW BARIS | EPA REGION 2 - OFFICE OF GROUNDWATER MGMT. | (212) 264-5635 |

AND:
EDMUND KNYFD JR. (NUS)

DISCUSSION:
I asked Drew if there is a current or pending sole source aquifer designation for Newark. He said there is no current or pending sole source aquifer designation for Newark.

Edmund Knyfd Jr. 5-15-89

ACTION ITEMS:

NUS 067 REVISED 0581

REFERENCE NO. 14

# Uncontrolled Hazardous Waste Site Ranking System

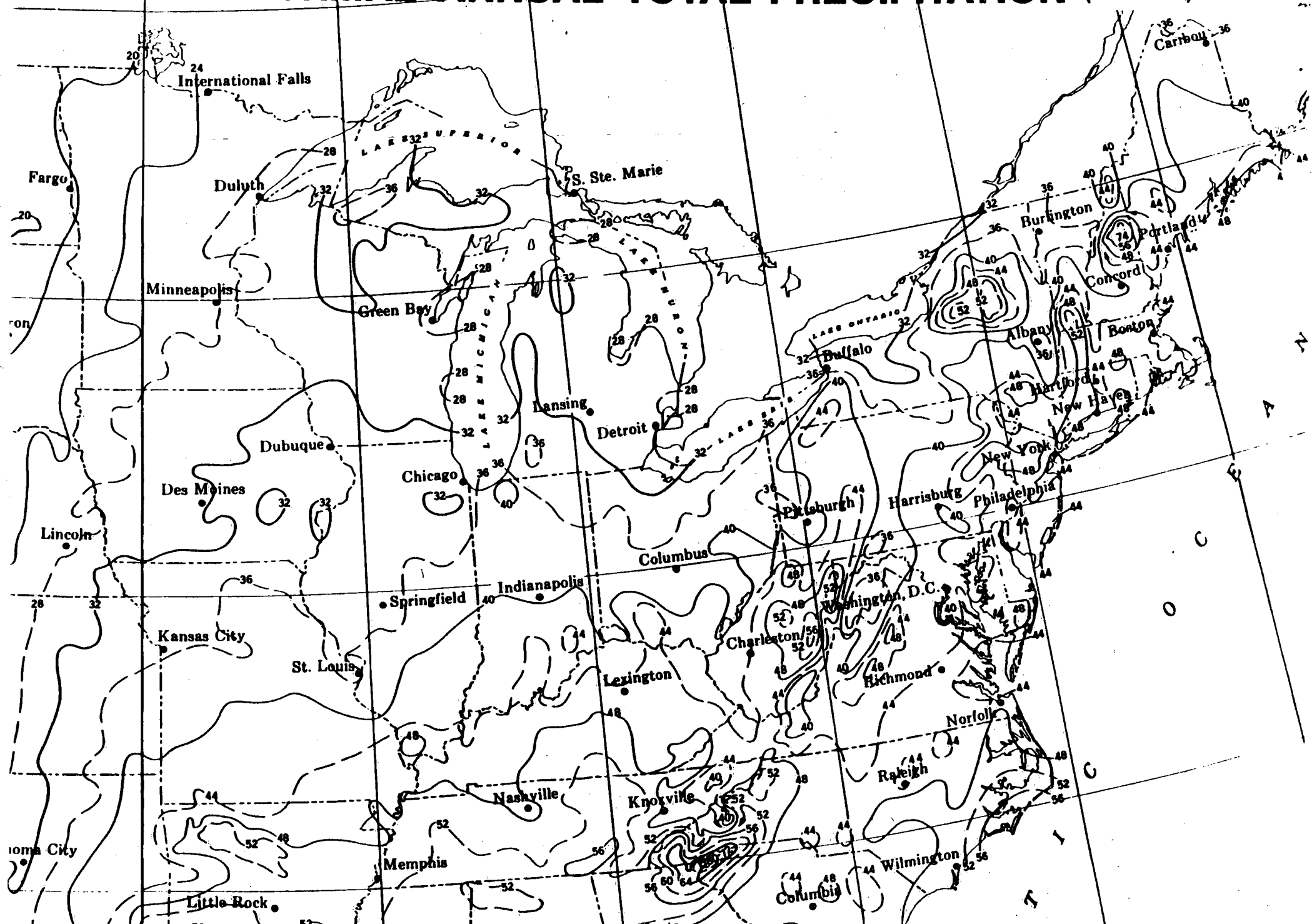
## A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

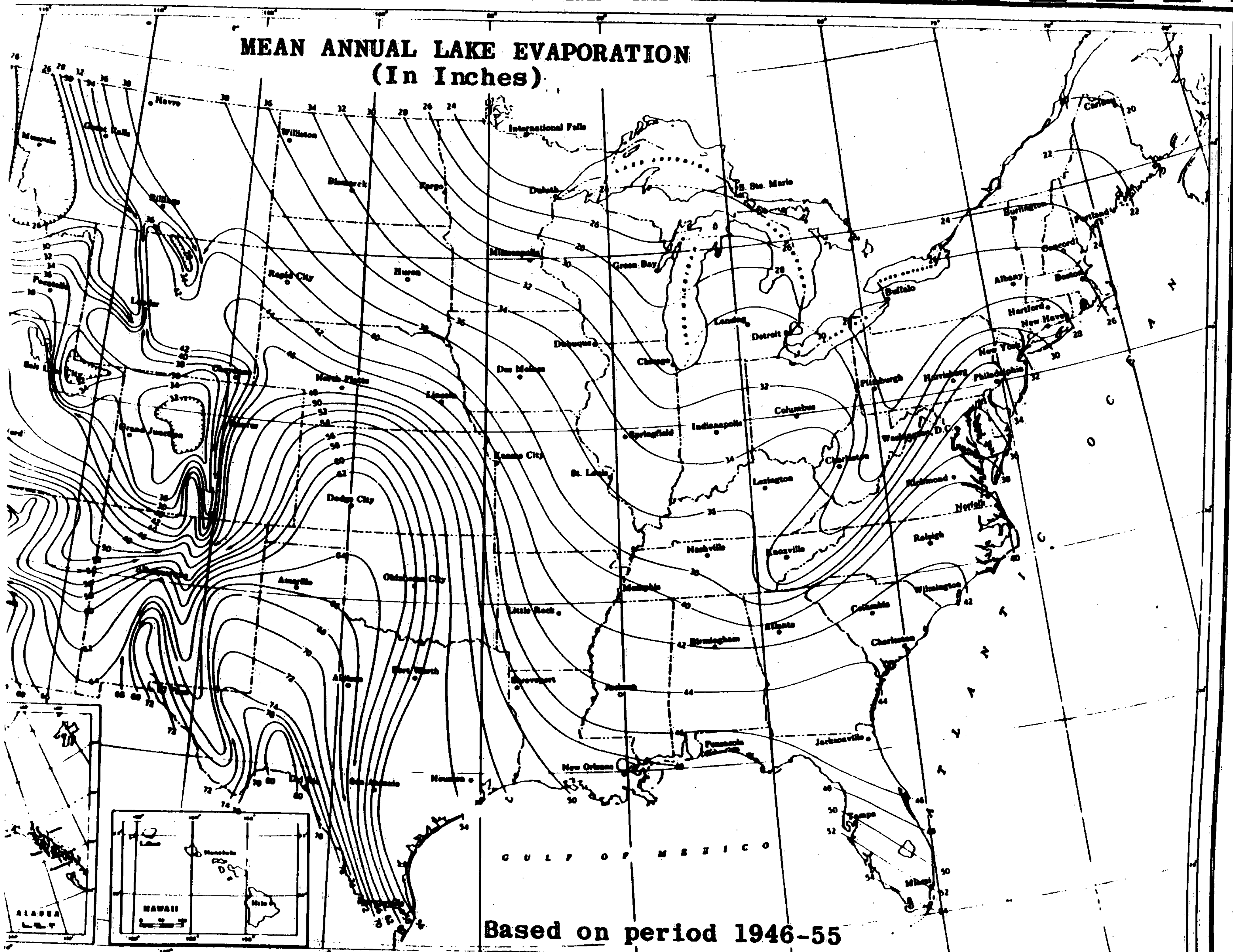
United States
Environmental Protection
Agency

1984

# NORMAL ANNUAL TOTAL PRECIPITATION (Inches)



# MEAN ANNUAL LAKE EVAPORATION (In Inches)




Based on period 1946-55

# 1 YEAR 24-HOUR RAINFALL (inches)

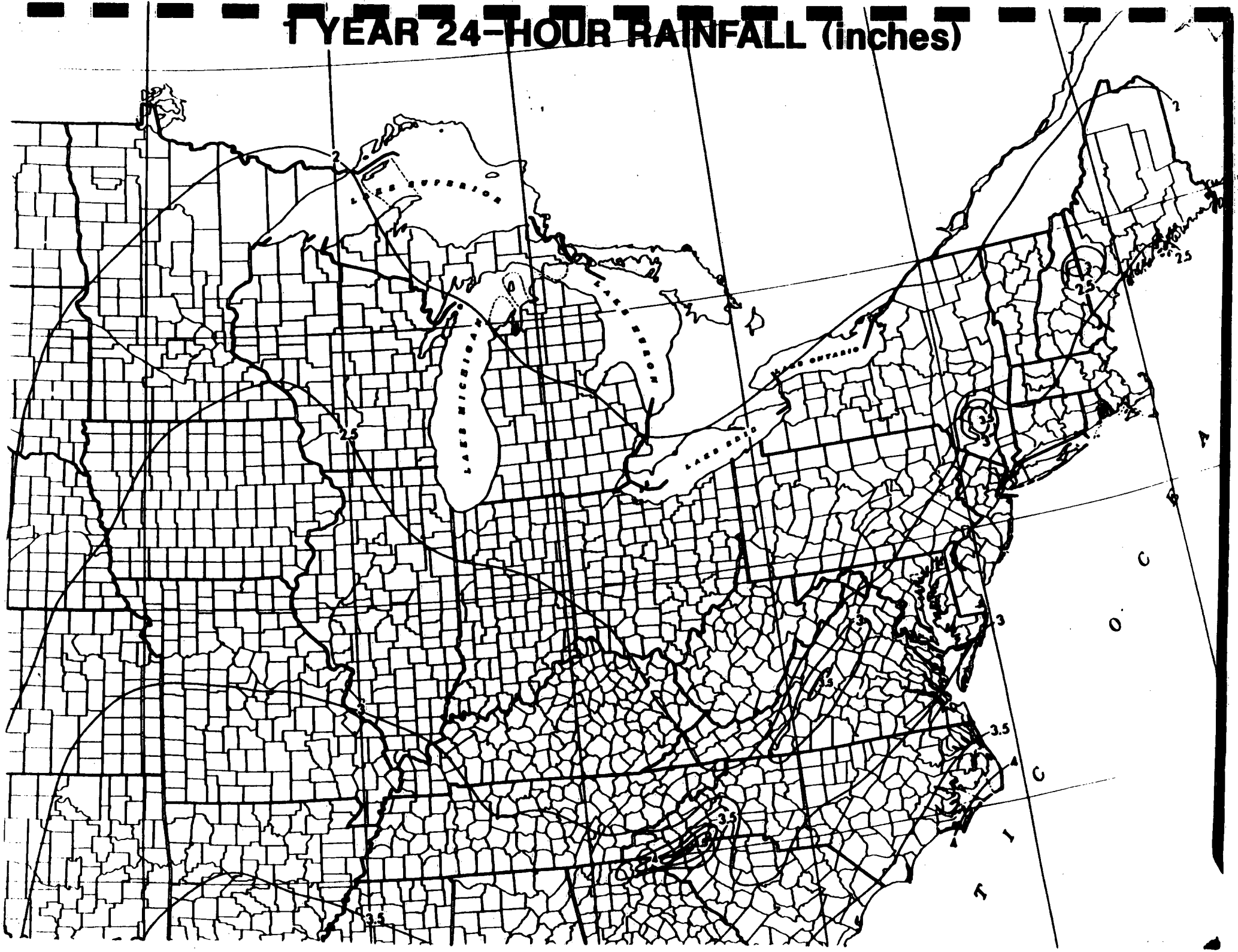


TABLE 2

PERMEABILITY OF GEOLOGIC MATERIALS*

| Type of Material | Approximate Range of Hydraulic Conductivity | Assigned Value |
|---|---|---|
| Clay, compact till, shale; unfractured metamorphic and igneous rocks | $<10^{-7}$ cm/sec | 0 |
| Silt, loess, silty clays, silty loams, clay loams; less permeable limestone, dolomites, and sandstone; moderately permeable till | $10^{-5} - 10^{-7}$ cm/sec | 1 |
| Fine sand and silty sand; sandy loams; loamy sands; moderately permeable limestone, dolomites, and sandstone (no karst); moderately fractured igneous and metamorphic rocks, some coarse till | $10^{-3} - 10^{-5}$ cm/sec | 2 |
| Gravel, sand; highly fractured igneous and metamorphic rocks; permeable basalt and lavas; karst limestone and dolomite | $>10^{-3}$ cm/sec | 3 |

*Derived from:

Davis, S. N., Porosity and Permeability of Natural Materials in Flow-Through Porous Media, R.J.M. DeWest ed., Academic Press, New York, 1969

Freeze, R.A. and J.A. Cherry, Groundwater, Prentice-Hall, Inc., New York, 1979

REFERENCE NO. 15

**NUS CORPORATION AND SUBSIDIARIES** — **TELECON NOTE**

| CONTROL NO: | DATE: | TIME: |
|---|---|---|
| 02-8904-24 | 4-17-89 | 1435 |

**DISTRIBUTION:**
Groundwater usage in the City of Newark
Anheuser-Busch Inc.

| BETWEEN: | OF: | PHONE: |
|---|---|---|
| Ms. James | Newark City Water Dept | (201) 256-4965 |

**AND:**
John Harrison (NUS Corp)

**DISCUSSION:**

City of Newark draws its drinking water from the Pequannock watershed which is a system of five reservoirs. Where Anheuser-Busch Inc is located, it is served by the Wanaque Reservoir. All of these reservoirs are located in Northern Passaic County. All water usage in the city of Newark is strictly industrial. JC 4-17-89

**ACTION ITEMS:**

NUS 067 REVISED 0685

REFERENCE NO. 16

NUS CORPORATION AND SUBSIDIARIES

TELECON NOTE

| CONTROL NO: | DATE: | TIME: |
|---|---|---|
| 02-8801-01 | 01-20-88 | 1400 |

DISTRIBUTION:

SCP

| BETWEEN: | OF: | PHONE: |
|---|---|---|
| Mr Melito | Essex Dept of Public Work - Engineer | (201) 2268500 |

AND:

Richard Pagano

DISCUSSION:

Mr Melito informed me that to his knowledge there are no drinking water wells in the whole city of Newark

ACTION ITEMS:

NUS 067 REVISED 0685

REFERENCE NO. 17

**NUS CORPORATION AND SUBSIDIARIES** — **TELECON NOTE**

| CONTROL NO: | DATE: | TIME: |
|---|---|---|
| 02-8904-24 | 4-18-89 | 1130 |

**DISTRIBUTION:** Anheuser-Busch Inc.

| BETWEEN: | OF: | PHONE: |
|---|---|---|
| Engineering Dept. | Elizabeth Water Company | (201) 272-0610 |

**AND:** John Harrison (NUS Corp)

**DISCUSSION:**

I spoke with a ~~Eng~~ Company Engineer, and he informed me that there are no public supply wells in the area of the Newark/Union Co. border. Elizabethtown Water Company's service extends from Northwestern Newark to Southwestern Elizabeth. A large portion of Union County is serviced by them. Anheuser-Busch Inc. is located approx 1 mile from Elizabethtown's Water Company's service.

JH 4-18-89

**ACTION ITEMS:**

NUS 067 REVISED 0685

REFERENCE NO. 18

**NUS CORPORATION**
**SUPERFUND DIVISION**

**PROJECT NOTES**

TO: ORBIS PRODUCTS

DATE: 6/19/89

FROM: PAUL BAUER

COPIES:

SUBJECT: LOCATION of Ref. 18

REFERENCE: REPORT No 02-8905-06-PA

Reference 18, The 3 mile Vicinity MAP, is LOCATED in THE BACK of THIS REPORT

Paul Bauer

NUS 443A 58 1182

REFERENCE NO. 19

# PRELIMINARY ASSESSMENT
# OFF SITE RECONNAISSANCE
# INFORMATION REPORTING FORM

Date: May 11, 1989

Site Name: Orbis Products Corp TDD: 02-8905-06

Site Address: 55 Virginia Street
Street, Box, etc.

Newark, ~~NJ~~
Town

Essex
County

New Jersey
State

NUS Personnel:

| Name | Discipline |
|---|---|
| Dennis Foerter | Environmental Analyst |
| Richard Hubner | Biologist |
| | |

Weather Conditions (clear, cloudy, rain, snow, etc.):
Rainy - 45° to 50° wind ~~0-5~~

Estimated wind direction and wind speed: 0-5 mph

Estimated temperature: 45 to 50°

Signature: Dennis G. Foerter Date: 5/11/89

Countersigned: [illegible] Date: 5/11/89

# PRELIMINARY ASSESSMENT

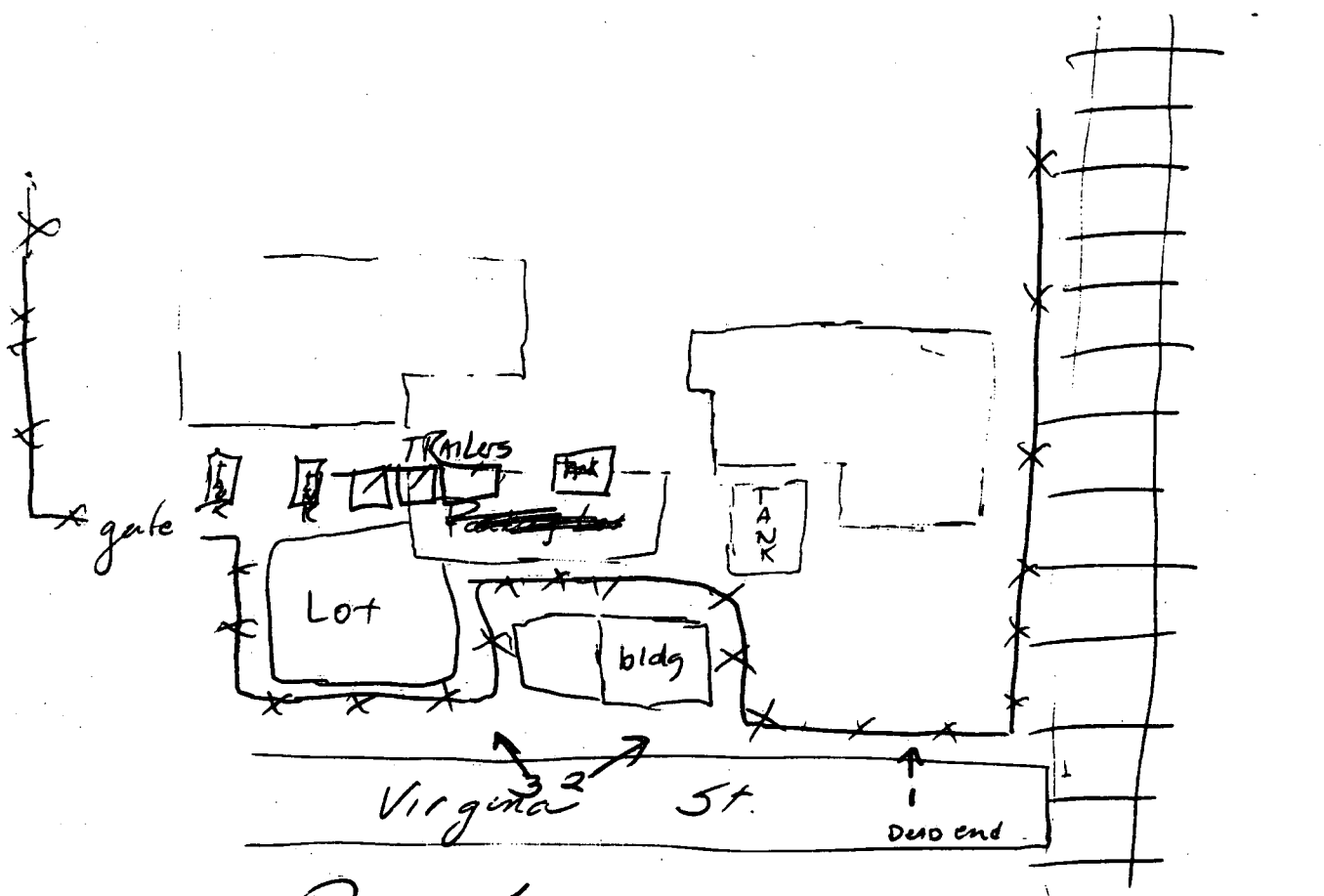
## INFORMATION REPORTING FORM

Date: May 11, 1984

Site Name: Orbis Products Corp TDD: 02-8905-06

Site Sketch:

Indicate relative landmark locations (streets, buildings, streams, etc.). Provide locations from which photos are taken.




Signature: [signature] Date: 5/11/84

Countersigned: [signature] Date: 5/11/84

**PRELIMINARY ASSESSMENT**

**INFORMATION REPORTING FORM**

Date: May 11, 1989

Site Name: Orbis Products Corp TDD: 02-8905-06

Notes (Periodically indicate time of entries in military time):

10:02 arrived on site

Site is run-down and enclosed with a falling fence and bordered by Virginia Ave and a Railroad track. Site is fairly level and site looks active. Numerous tanks visible and also some trailers w/ may be for storage. limited site access so visibility is poor.

10:15 left site.

Signature: Dennis J Trentz Date: 5/11/89

Countersignature: [illegible] Date: 5/11/89

# PRELIMINARY ASSESSMENT

## INFORMATION REPORTING FORM

Date: _____

Site Name: Orbis Products Corp TDD: 02-8905-06

Notes (Cont'd):

Attach additional sheets if necessary. Provide site name, TDD number, signature, and countersignature on each.

Signature: _____ Date: _____

Countersignature: _____ Date: _____

# PRELIMINARY ASSESSMENT

## INFORMATION REPORTING FORM

Date: May 11, 1989

Site Name: Orbis Products Corp TDD: 02-8905-06

Photolog:

| Frame/Photo Number | Date | Time | Photographer | Description |
|---|---|---|---|---|
| 1 S,P | 5/11/89 | 10:07 | D. Foerter | edge of bldg by Railroad Track |
| 2 S,P | 5/11/89 | 10:11 | ↓ | bldg by Tanks Looking east |
| 3 S,P | 5/11/89 | 10:11 | ↓ | Main bldg w/ tanks and trailers |

Attach additional sheets if necessary. Provide site name, TDD number, signature, and countersignature on each.

Signature: Dennis G. Foerter Date: 5/11/89

Countersignature: [illegible] Date: 5/11/89

REFERENCE NO. 20

**NUS CORPORATION AND SUBSIDIARIES** — **TELECON NOTE**

| CONTROL NO: | DATE: | TIME: |
|---|---|---|
| 02-8904-24-PA | 5/15/89 | 1000 |

**DISTRIBUTION:** Weequahic Lake (uses)

| BETWEEN: | OF: | PHONE: |
|---|---|---|
| Mr Peoples | Newark Water Dept (Engineering Dept) | (201) 733-3654 |

**AND:** John Harrison

**DISCUSSION:**

Mr Peoples informed me that Weequahic Lake has no apparent uses. However in the event of a drought emergency water is drawn from other water depts and reservoirs not the Weequahic Lake. The lake would only be used for industrial purposes during a drought situation. DJO 5/15/89

**ACTION ITEMS:**

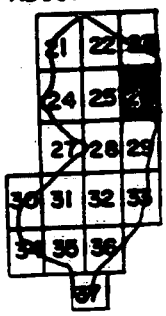
NUS 067 REVISED 0685

REFERENCE NO. 21

# STATE OF NEW JERSEY
# DEPARTMENT OF ENVIRONMENTAL PROTECTION

DAVID J. BARDIN, COMMISSIONER

KEY TO ADJOINING SHEETS




## LEGEND

**URBAN AND BUILT-UP LAND**

11 RESIDENTIAL
12 COMMERCIAL & SERVICES
13 INDUSTRIAL
14 TRANSPORTATION, COMMUNICATION & UTILITIES
15 INDUSTRIAL & COMMERCIAL COMPLEXES
16 MIXED URBAN & BUILT-UP LAND
17 OTHER URBAN OR BUILT-UP LAND

**AGRICULTURAL LAND**

21 CROPLAND & PASTURE
22 ORCHARDS & HORTICULTURAL AREAS

**FOREST LAND**

41 DECIDUOUS
42 EVERGREEN
43 MIXED

**WATER**

51 STREAMS & CANALS
52 LAKES
53 RESERVOIRS
54 BAYS & ESTUARIES

**WETLAND**

61 FORESTED WETLAND
62 NONFORESTED WETLAND

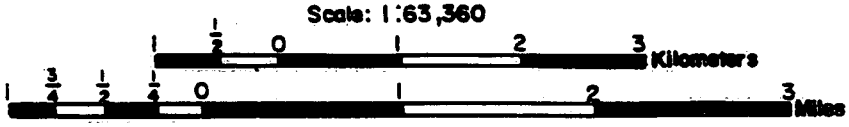
**BARREN LAND**

72 BEACHES
73 SAND OTHER THAN BEACHES
74 BARE EXPOSED ROCK
75 STRIP MINES, QUARRIES, & GRAVEL PITS

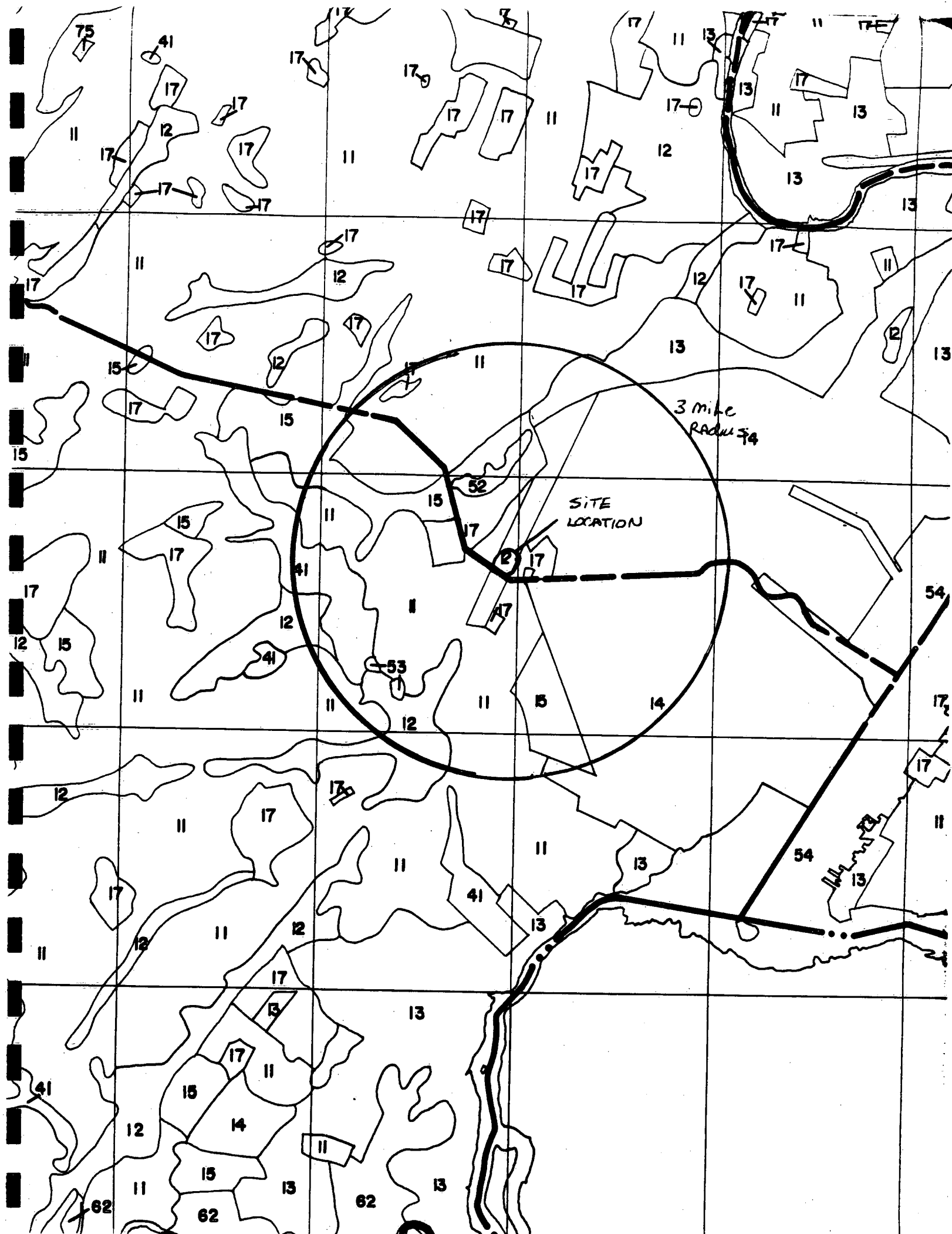
# LAND USE OVERLAY
# SHEET 26

BUREAU OF GEOLOGY AND TOPOGRAPHY
KEMBLE WIDMER, STATE GEOLOGIST
1976

Scale: 1:63,360




SUPERVISED BY GEORGE J. HALASI-KUN, TOPOGRAPHIC ENGINEER
DRAFTED BY JOHN E OLSCHEWSKI


3 mile
RADIUS
SITE
LOCATION

REFERENCE NO. 22

# Newark

## N. J.–N. Y.–PA.

## LAND USE–LAND COVER SYMBOLS

Study area (coastal zone boundary to three-mile limit) .....

Special land use areas, including refuges and wildlife management areas, parks and seashores; may be used in lieu of habitat boundary .....

Subdivision of a special land use area into more than one designation .....

Swamp .....

Marsh .....

Beach/Dunes .....

Seagrass .....

Reef .....

## POINT AND AREA FEATURE SYMBOLS

(shown in RED for species with special status; shown in BLUE for aquatic organisms; and shown in BROWN for terrestrial organisms)

Localized concentration of species ..... 800m

General habitat boundary for indicated species; may be superceded by special land use boundary ..... 1000

## 1:250 000-scale map of

# Atlantic Coast Ecological Inventory

Produced by
U. S. FISH AND WILDLIFE SERVICE
1980

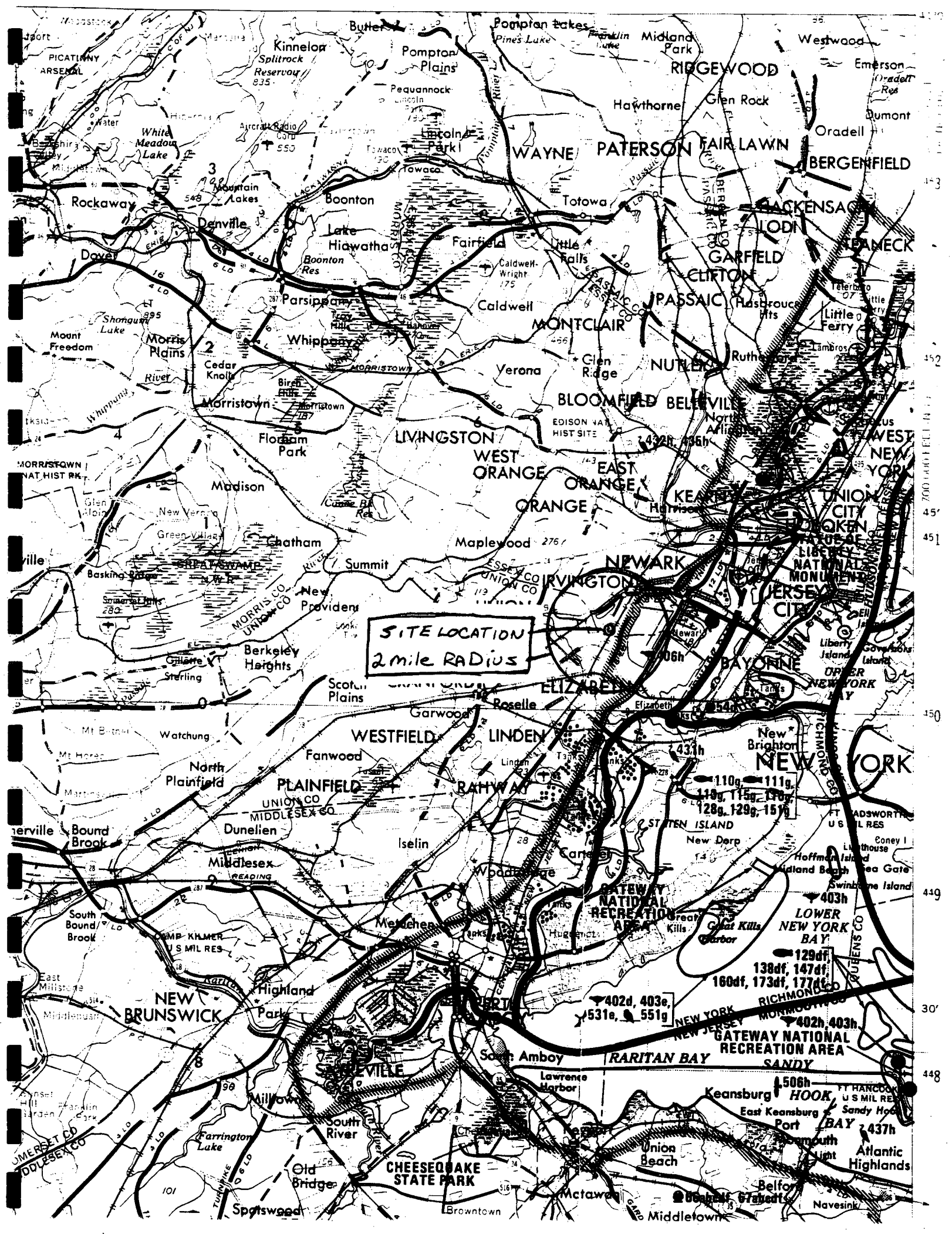
Scale 1:250,000

5 0 5 10 15 20 Statute Miles

5 0 5 10 15 20 25 30 Kilometers

5 0 5 10 15 Nautical Miles

TRANSVERSE MERCATOR PROJECTION


SITE LOCATION
2 mile RADIUS
Pompton Lakes
Midland Park
Westwood
Emerson
RIDGEWOOD
Glen Rock
Hawthorne
Dumont
Oradell
Kinnelon
Pompton Plains
Pequannock
Lincoln Park
WAYNE
PATERSON
FAIR LAWN
BERGENFIELD
Rockaway
Mountain Lakes
Boonton
Totowa
HACKENSACK
LODI
TEANECK
Denville
Lake Hiawatha
Fairfield
Little Falls
GARFIELD
CLIFTON
Dover
Parsippany
Caldwell
PASSAIC
Hasbrouck Hts
Little Ferry
MONTCLAIR
Morris Plains
Whippany
Cedar Knolls
Verona
Glen Ridge
NUTLEY
Rutherford
Morristown
BLOOMFIELD
BELLEVILLE
Florham Park
LIVINGSTON
WEST ORANGE
EAST ORANGE
ORANGE
KEARNY
UNION CITY
HOBOKEN
WEST NEW YORK
Madison
Chatham
Maplewood
Summit
NEWARK
IRVINGTON
JERSEY CITY
STATUE OF LIBERTY NATIONAL MONUMENT
Basking Ridge
New Providence
Berkeley Heights
Sterling
Scotch Plains
ELIZABETH
BAYONNE
UPPER NEW YORK BAY
Roselle
Garwood
WESTFIELD
LINDEN
Watchung
Fanwood
North Plainfield
PLAINFIELD
RAHWAY
New Brighton
NEW YORK
Bound Brook
Dunellen
Iselin
Middlesex
Woodbridge
STATEN ISLAND
New Dorp
Coney I
Sea Gate
GATEWAY NATIONAL RECREATION AREA
Great Kills
Great Kills Harbor
LOWER NEW YORK BAY
South Bound Brook
Metuchen
Highland Park
NEW BRUNSWICK
South Amboy
RARITAN BAY
SANDY HOOK BAY
Keansburg
East Keansburg
Port Monmouth
Atlantic Highlands
Millstone
South River
Farrington Lake
Old Bridge
CHEESEQUAKE STATE PARK
Spotswood
Browntown
Union Beach
Belford
Navesink
Middletown
110g, 111g, 119g, 115g, 116g, 128g, 129g, 151g
431h
406h
402d, 403e, 531e, 551g
402h, 403h
403h
129df, 138df, 147df, 160df, 173df, 177df
506h
437h
432h, 436h
45'
30'

REFERENCE NO. 23

# Surface Water Classifications

## Surface Water Quality Standards
## N.J.A.C. 7:9-4

### Index D-
### Surface Water Classifications of the Passaic, Hackensack and N.Y. Harbor Complex Basin

July 1985

State of New Jersey Department of Environmental Protection/Division of Water Resources

| | |
|---|---|
| (Stockholm) - Brook between Hamburg Turnpike and Williamsville-Stockholm Rd. to its confluence with Lake Stockholm Brook, north of Rt. 23 | FW1 [tm] |
| LITTLE POND BROOK (Oakland) - Entire length | FW2-TP(C1) |
| LOANTAKA BROOK | |
| (Green Village) - Entire length, except segment described below | FW2-NT |
| (Great Swamp) - Brook and all tributaries within the boundaries of Great Swamp National Wildlife Refuge | FW2-NT(C1) |
| LUD-DAY BROOK | |
| (Camp Garfield) - Source to confluence with a tributary from Camp Garfield | FW1 |
| MACOPIN RIVER | |
| (Newfoundland) - Source to Echo Lake dam | FW2-NT |
| (Newfoundland) - Echo Lake dam to Pequannock River | FW2-TM |
| MEADOW BROOK (Wanaque) - Skyline Lake to Wanaque River | FW2-NT |
| MILL BROOK | |
| (Randolph) - Source to Rt. 10 bridge | FW2-TP(C1) |
| (Randolph) - Rt. 10 bridge to Rockaway River | FW2-NT |
| MORSES CREEK - Entire length | FW2-NT/SE3 |
| MOSSMAN'S BROOK - See CLINTON BROOK | |
| MT. TABOR BROOK (Morris Plains) - Entire length | FW2-NT |
| NEWARK BAY (Newark) - North of an east-west line connecting Elizabethport with Bergen Pt., Bayonne up to the mouths of the Passaic and Hackensack Rivers | SE3 |
| NOSENZO POND (Upper Macopin) | FW2-NT(C1) |
| OAK RIDGE RESERVOIR (Oak Ridge) | FW2-TM |
| OAK RIDGE RESERVOIR (Oak Ridge) - Northwestern tributary to Reservoir | FW1 [tm] |
| OVERPECK CREEK (Palisades Park) - Entire length | FW2-NT/SE2 |
| PECKMAN RIVER (Verona) - Entire length | FW2-NT |
| PACACK BROOK | |
| (Stockholm) - Source to Pequannock River, excluding Canistear Reservoir, except segments described separately below | FW2-NT |
| (Canistear) - Brook and tributaries upstream of Canistear Reservoir located entirely within the boundaries of the Newark Watershed | FW1 |
| PASSAIC RIVER | |
| (Mendham) - Source to Rt. 202 bridge (Van Doren's Mill), except tributaries described separately below | FW2-TM |
| (Paterson) - Rt. 202 bridge to Dundee Lake dam | FW2-NT |
| (Little Falls) - Dundee Lake dam to confluence with Second River | FW2-NT/SE2 |
| (Newark) - Confluence with Second River to mouth | SE3 |

| | |
|---|---|
| WANAQUE RIVER | |
| MAIN STEM | |
| (Hewitt) - Greenwood Lake outlet, through Wanaque Wildlife Management Area to the boundary of the State Park and Forest land at Monks, except tributary described separately below | FW2-TM(C1) |
| (Hewitt) - Entire length of tributary south of Jennings Creek | FW2-TP(C1) |
| (Monks) - Parkland boundary to Wanaque Reservoir | FW2-TM |
| (Pompton Lakes) - Wanaque Reservoir dam to Pompton River | FW2-NT |
| WEST BROOK (W. Milford) - Entire length | FW2-TP(C1) |
| WEST POND (Hewitt) | FW1 |
| WEYBLE POND (Ringwood) | FW2-NT(C1) |
| WHIPPANY RIVER | |
| (Brookside) - Source to Whitehead Rd. bridge | FW2-TP(C1) |
| (Morristown) - Whitehead Rd. bridge to Passaic River | FW2-NT |
| WONDER LAKE (West Milford) | FW2-NT(C1) |
| WOODBRIDGE RIVER - Entire length | FW2-NT/SE3 |

REFERENCE NO. 24

GSC-TR8645

# GRAPHICAL EXPOSURE MODELING SYSTEM

# (GEMS)

# USER'S GUIDE

# VOLUME 2. MODELING

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION
Task No. 3-2
Contract No. 68023970
Project Officer: Russell Kinerson
Task Manager: Loren Hall

Prepared by:

GENERAL SCIENCES CORPORATION
8401 Corporate Drive
Landover, Maryland 20785

Submitted: December 1, 1986

GEMS> I

ORBIS PRODUCTS
LATITUDE 40:41:18 LONGITUDE 74:12:10 1980 POPULATION

| KM | 0.00-.400 | .400-.810 | .810-1.60 | 1.60-3.20 | 3.20-4.80 | 4.80-6.40 | SECTOR TOTALS |
|---|---|---|---|---|---|---|---|
| S 1 | 5305 | 3028 | 18345 | 73734 | 163139 | 194323 | 457874 |
| RING TOTALS | 5305 | 3028 | 18345 | 73734 | 163139 | 194323 | 457874 |

GEMS> I

ORBIS PRODUCTS
LATITUDE 40:41:18 LONGITUDE 74:12:10 1980 HOUSING

| KM | 0.00-.400 | .400-.810 | .810-1.60 | 1.60-3.20 | 3.20-4.80 | 4.80-6.40 | SECTOR TOTALS |
|---|---|---|---|---|---|---|---|
| S 1 | 2207 | 1079 | 7629 | 24984 | 57047 | 69535 | 162481 |
| RING TOTALS | 2207 | 1079 | 7629 | 24984 | 57047 | 69535 | 162481 |

| Distance | Population | Housing |
|---|---|---|
| 1/4 | 5305 | 2207 |
| 1/2 | 8333 | 3286 |
| 1 | 26,678 | 10,915 |
| 2 | 100,412 | 35,899 |
| 3 | 263,551 | 92,946 |
| 4 | 457,874 | 162,481 |

REFERENCE NO. 25

**Elson T. Killam Associates, Inc.**

27 Bleeker Street, P.O. Box 1008, Millburn, NJ 07041
Tel. 201/379-3400 Telex 642-057 Telecopier 201/376-1072

Environmental and Hydraulic Engineers

# ANALYTICAL DATA REPORT

**ORBIS PRODUCTS CORP.**

**NEWARK, NEW JERSEY**

**U.G. STORAGE TANK AREA**

**PROJECT NUMBER:** P87-304

**LABORATORY REFERENCE NUMBER:** 2033-6007

**DATE AND TIME COLLECTED:** 8/7/87 11:20

Nancy J. Potak
LABORATORY DIRECTOR

SEPTEMBER 24, 1987

N.J. LABORATORY
CERTIFICATION NO.: 07059

Elson T. Killam Associates, Inc.

# LABORATORY CHRONICLE

**LABORATORY SAMPLE NO.:** 2033-6007

**RECEIVED:** 8/7/87

**ORGANICS:**

**EXTRACTION:**

**ANALYSES:**

1. **VOLATILE COMPOUNDS:** 8/20/87
2. **ACID EXTRACTABLES:**
3. **BASE/NEUTRALS:**
4. **PESTICIDES/PCBs:**

**METALS:**

**DIGESTION:**

**ANALYSES:**

| OTHER ANALYSES: | EXTRACTED: | ANALYSES: |
|---|---|---|
| PHC | 8/13/87 | 8/14/87 |

**QUALITY CONTROL SUPERVISOR**
**REVIEW AND APPROVAL:** [illegible]

# METHODOLOGY SUMMARY

**Purgeable Organics**

USEPA METHOD 624

**Acid Extractables**

**Base/Neutral Extractables**

**PESTICIDE EXTRACTABLES**

**Metals**

**Total Cyanide**

**Total Phenol**

**Other** PHC - USEPA METHOD 418.1 (Modified for soil)

# PETROLEUM HYDROCARBONS DATA

LABORATORY SAMPLE NO.: 2033-6007

| | CONCENTRATION DRY WEIGHT (mg/Kg) | DETECTION LIMIT (mg/Kg) |
|---|---|---|
| PETROLEUM HYDROCARBONS | 3,630 | 156 |

BDL = BELOW DETECTION LIMIT

## PETROLEUM HYDROCARBONS
## MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

**LAB REFERENCE ID NO.:** 2033-6007 **QUALITY ASSURANCE SAMPLE:** 2033-6006

| LAB SAMPLE NO. | CONC. SPIKE ADDED | SAMPLE CONC. | CONC. MS | % REC | CONC. MSD | % REC | RPD |
|---|---|---|---|---|---|---|---|
| 2033-6006..... | 610 | <30 | 612 | 100 | 632 | 104 | 4 |

Concentration - mg/kg
RPD - relative percent difference

## DATA QUALIFIERS

The following four qualifiers are used in the analytical report package. They are equivalent to those issued by EPA - Contract Laboratory Program:

U - Indicates that the compound was analyzed for but not detected. All sample detection limits reported have been corrected for dilution and per cent moisture. No adjustements for blank contamination have been made.

J - Refers to an estimated value. This is used when the mass spectral data indicates the presence of a compound that meets the identification criteria, yet has a concentration less than the contract required detection limit. All estimated values reported have been adjusted for both dilution and per cent moisture, but no corrections have been made for possible blank contamination.

B - This flag is used to note that the compound was found to be present in the laboratory blank as well as in the sample. It indicates that the possibility of laboratory contamination exists.

The EPA has issued certain quidelines to aid in the evaluation of data when common laboratory artifacts occur. Blank contribution is considered to be negligable if it is ten times less than the concentration present in the sample. If the concentrations of the compounds found in both the sample and the blank are comparable (i.e. sample concentration is less than twice that of the blank), the occurance of the compound in the sample is considered to be suspect.

Up to 25 ppb of methylene chloride is permitted to be present in the blanks of volatile organic analyses.

C - Applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ul in the final extract are confirmed by GC/MS.

The next qualifier is also used in referencing the analytical results:

X - This flag indicates the presence of a compound which is often found as a common laboratory or field contaminant.

# VOLATILE COMPOUNDS DATA

**LABORATORY SAMPLE NO.:** 2033-6007( 1/10 DIL ) **DATA FILE NO.:** VOA5802

**% SOLIDS:** 76.7

| | CONCENTRATION (ug/Kg) | | SCAN | DETECTION LIMIT (ug/Kg) |
|---|---|---|---|---|
| ACROLEIN | | U | | 1300. |
| ACRYLONITRILE | | U | | 1300. |
| BENZENE | 9200 | | 606 | 65. |
| BROMOFORM | | U | | 65. |
| BROMOMETHANE | | U | | 130. |
| CARBON TETRACHLORIDE | | U | | 65. |
| CHLOROBENZENE | 220 | | 830 | 65. |
| DIBROMOCHLOROMETHANE | | U | | 65. |
| CHLOROETHANE | | U | | 130. |
| 2-CHLORO ETHYL VINYL ETHER | | U | | 130. |
| CHLOROFORM | 22 | J | 441 | 65. |
| CHLOROMETHANE | | U | | 65. |
| BROMODICHLOROMETHANE | | U | | 65. |
| 1,1-DICHLOROETHANE | | U | | 65. |
| 1,2-DICHLOROETHANE | | U | | 65. |
| 1,1-DICHLOROETHENE | | U | | 65. |
| TRANS-1,2-DICHLOROETHENE | | U | | 65. |
| 1,2-DICHLOROPROPANE | | U | | 65. |
| CIS-1,3-DICHLOROPROPENE | | U | | 65. |
| TRANS-1,3-DICHLOROPROPENE | | U | | 65. |
| ETHYLBENZENE | 290 | | 893 | 65. |
| METHYLENE CHLORIDE | 61 | JB | 282 | 65. |
| 1,1,2,2-TETRACHLOROETHANE | | U | | 65. |
| TETRACHLOROETHENE | | U | | 65. |
| TOLUENE | 4300 | | 796 | 65. |
| 1,1,1-TRICHLOROETHANE | | U | | 65. |
| 1,1,2-TRICHLOROETHANE | | U | | 65. |
| TRICHLOROETHENE | | U | | 65. |
| VINYL CHLORIDE | | U | | 130. |
| ACETONE - HSL | 1500 | | 299 | 130. |
| CARBON DISULFIDE - HSL | | U | | 65. |
| 2-HEXANONE - HSL | 240 | | 754 | 130. |
| 2-BUTANONE | | U | | 130. |
| 4-METHYL-2-PENTANONE -HSL | 88 | J | 704 | 130. |
| STYRENE - HSL | | U | | 65. |
| TOTAL XYLENES - HSL | 714 | | 1018,1050 | 65. |

Laboratory Name E.T. Killam Assoc.

Case No

| Sample Number |
|---|
| 2033-6007 |

## Organics Analysis Data Sheet
(Page 4)

### Tentatively Identified Compounds

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. 110-82-7 | CyclohexaneDOT | VOA | 516 | 1,100 |
| 2. 96-37-7 | Cyclopentane, Methyl | VOA | 535 | 1,700 |
| 3. 79-29-8 | Butane, 2,3-Dimethyl | VOA | 570 | 180 |
| 4. 628-16-0 | 1,5-HexaDiyne | VOA | 594 | 4,500 |
| 5. 96-14-0 | Pentane, 3-Methyl | VOA | 648 | 4,100 |
| 6. 589-34-4 | Hexane, 3-Methyl | VOA | 741 | 84 |
| 7. 586-63-0 | Cyclohexene, 3-Methyl-6- | | | |
| 8. | (Methylethylidene) | VOA | 877 | 380 |
| 9. 18172-67-3 | Bicyclo[3.1.1] Heptane, 6,6- | | | |
| 10. | Dimethyl-2-Methylene-, (1S) | VOA | 903 | 380 |
| 11. 470-82-6 | 2 OxaBicyclo[2.2.2] Octane 1,3,3- | | | |
| 12. | Trimethyl | VOA | 955 | 660 |
| 13. 2867-05-2 | Bicyclo[3.1.0] Hex-2-ene, 2-Methyl- | | | |
| 14. | 5-(1-Methylethyl) | VOA | 987 | 180 |
| 15. 7622-2 | Bicyclo[2.2.1] Heptan-2-one, | | | |
| 16. | 1,7,7-Trimethyl | VOA | 1029 | 459 |
| 17. 106-43-4 | Benzene, 1-Chloro-4-Methyl | VOA | 1097 | 960 |
| 18. | | | | |
| 19. | | | | |
| 20. | | | | |
| 21. | | | | |
| 22. | | | | |
| 23. | | | | |
| 24. | | | | |
| 25. | | | | |
| 26. | | | | |
| 27. | | | | |
| 28. | | | | |
| 29. | | | | |
| 30. | | | | |

# METHOD PERFORMANCE DATA

## SOILS SURROGATE PERCENT RECOVERY

LABORATORY SAMPLE NO.: 2033-6007

| COMPOUND | RECOVERY | EPA CONTROL LIMITS | SCAN # |
|---|---|---|---|
| **VOLATILE FRACTION** | | | |
| TOLUENE - D8 | 36* | 81-117 | 781 |
| BROMOFLUOROBENZENE | 84 | 74-121 | 970 |
| 1,2-DICHLOROETHANE | 104 | 70-121 | 459 |
| **SEMI-VOLATILE FRACTION** | | | |
| NITROBENZENE-D5 | - | 23-120 | - |
| 2-FLUOROBIPHENYL | - | 30-116 | - |
| TERPHENYL-D14 | - | 18-137 | - |
| PHENOL-D5 | - | 24-113 | - |
| 2-FLUOROPHENOL | - | 26-121 | - |
| 2,4,6-TRIBROMOPHENOL | - | 19-122 | - |
| **PESTICIDE** | | | |
| DIBUTYL CHLORENDATE | - | 20-150** | - |

*LOW SURROGATE RECOVERY DUE TO MATRIX EFFECT OF HIGH CONCENTRATION OF TOLUENE IN THE SAMPLE.
**ADVISORY LIMITS ONLY

# INTERNAL STANDARD SCAN LIST
## (RETENTION TIME)

LABORATORY SAMPLE NO.: 2033-6007

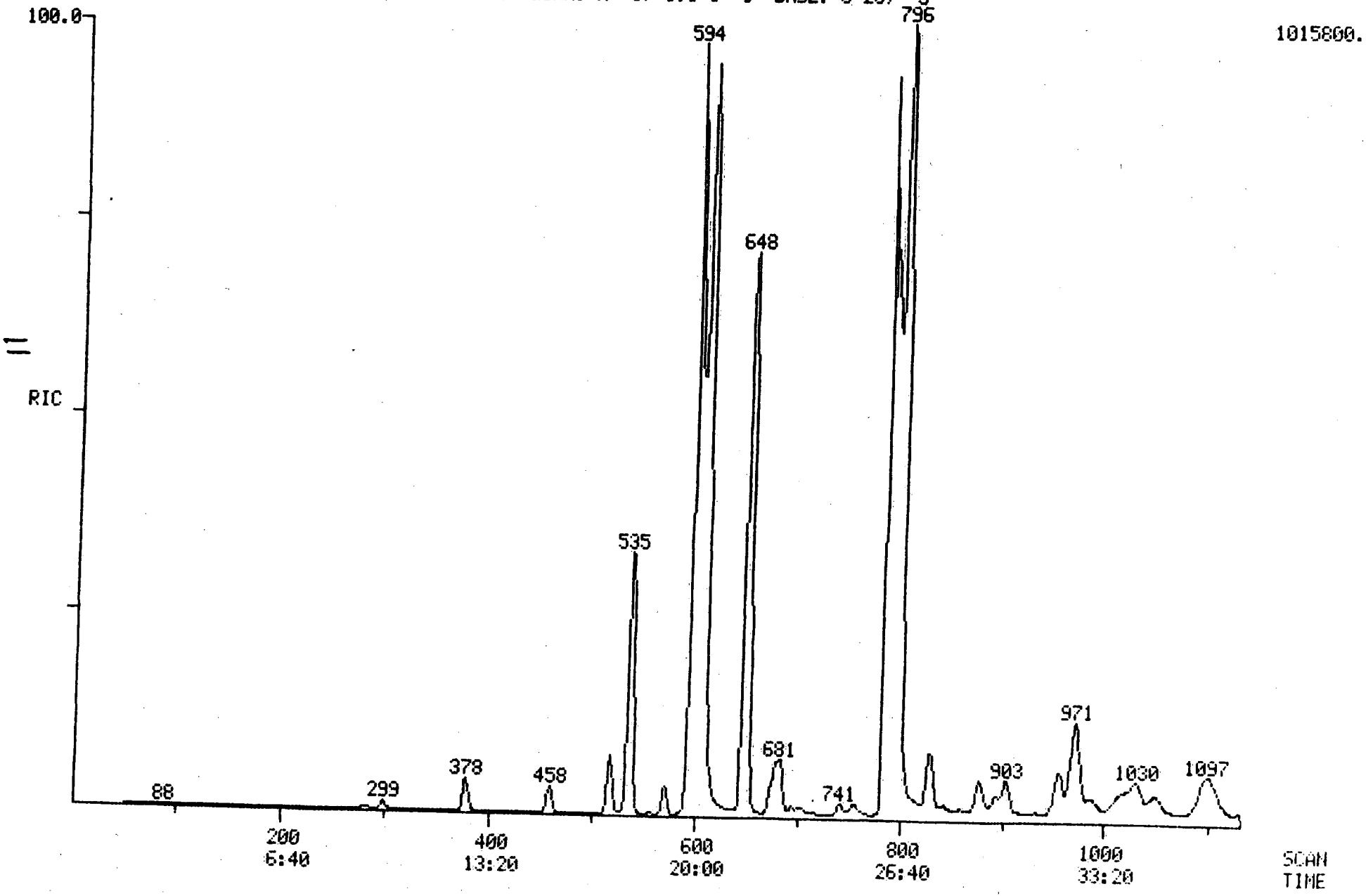
| INTERNAL STANDARD | SCAN # |
|---|---|
| **VOLATILE FRACTION** | |
| BROMOCHLOROMETHANE | 378 |
| 1,4-DIFLUOROBENZENE | 677 |
| CHLOROBENZENE-D5 | 827 |

| SEMI-VOLATILE FRACTION | SCAN # |
|---|---|
| 1,4-DICHLOROBENZENE-D4 | - |
| NAPTHALENE-D8 | - |
| ACENAPTHENE-D10 | - |
| PHENANTHRENE-D10 | - |
| CHRYSENE-D12 | - |
| PERYLENE-D12 | - |

MIDRIC
08/20/87 6:09:00
SAMPLE: GC/MS#1, 2033-6007 (1/10 DILUTION)
CONDS.: 624
RANGE: G 1,1130 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: VOA5802 #1
CALI: VOA5802 #2

SCANS 1 TO 1130



# SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Low Level X Medium Level _____

| FRACTION | COMPOUND | CONC. SPIKE ADDED (ug/Kg) | SAMPLE RESULT | CONC. MS | % REC | CONC. MSD | % REC | RPD | QC LIMITS * RPD | QC LIMITS * RECOVERY |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA SMO SAMPLE NO. 2033 6004 | 1,1-Dicholorethene | 50 | 0 | 38 | 76 | 47 | 94 | 10 | 22 | 59-172 |
| | Trichloroethene | 50 | 0 | 40 | 80 | 46 | 92 | 7 | 24 | 62-137 |
| | Chlorobenzene | 50 | 0 | 46 | 92 | 53 | 106 | 7 | 21 | 60-133 |
| | Toluene | 50 | 7 | 43 | 86 | 54 | 108 | 11 | 21 | 59-139 |
| | Benzene | 50 | 3 | 47 | 94 | 53 | 106 | 6 | 21 | 66-142 |
| B/N SMO SAMPLE NO. | 1,2,4-Trichlorobenzene | | | | | | | | 23 | 38-107 |
| | Acenaphthene | | | | | | | | 19 | 31-137 |
| | 2,4 Dinitrotoluene | | | | | | | | 47 | 28-89 |
| | Di-n-Butylphthalate | | | | | | | | 47 | 29-135 |
| | Pyrene | | | | | | | | 36 | 35-142 |
| | N-Nitrosodi-n-Propylamine | | | | | | | | 38 | 41-126 |
| | 1,4-Dichlorobenzene | | | | | | | | 27 | 28-104 |
| ACID SMO SAMPLE NO. | Pentachlorophenol | | | | | | | | 47 | 17-109 |
| | Phenol | | | | | | | | 35 | 26-90 |
| | 2-Chlorophenol | | | | | | | | 50 | 25-102 |
| | 4-Chloro-3-Methylphenol | | | | | | | | 33 | 26-103 |
| | 4-Nitrophenol | | | | | | | | 50 | 11-114 |
| PEST SMO SAMPLE NO. | Lindane | | | | | | | | 50 | 46-127 |
| | Heptachlor | | | | | | | | 31 | 35-130 |
| | Aldrin | | | | | | | | 43 | 34-132 |
| | Dieldrin | | | | | | | | 38 | 31-134 |
| | Endrin | | | | | | | | 45 | 42-139 |
| | 4,4'-DDT | | | | | | | | 50 | 23-134 |

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 0 out of 5 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

RECOVERY: VOAs 0 out of 10 : outside QC limits
B/N _____ out of _____ : outside QC limits
ACID _____ out of _____ : outside QC limits
PEST _____ out of _____ : outside QC limits

Comments: _____



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# GC/MS TUNING AND MASS CALIBRATION

## Bromofluorobenzene (BFB)

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Instrument ID 5100 Date 8/20/87 Time 5:21 + 32:20

Lab ID VOA 5801 Data Release Authorized By: JEF

| m/e | ION ABUNDANCE CRITERIA | %RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of the base peak | 18.11 |
| 75 | 30.0 - 60.0% of the base peak | 40.94 |
| 95 | Base peak, 100% relative abundance | 100.00 |
| 96 | 5.0 - 9.0% of the base peak | 5.76 |
| 173 | Less than 1.0% of the base peak | <1 |
| 174 | Greater than 50.0% of the base peak | 72.58 |
| 175 | 5.0 - 9.0% of mass 174 | 5.20 (7.16)[1] |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 70.66 (97.4)[1] |
| 177 | 5.0 - 9.0% of mass 176 | 4.48 (6.34)[2] |

[1] Value in parenthesis is % mass 174.
[2] Value in parenthesis is % mass 176.

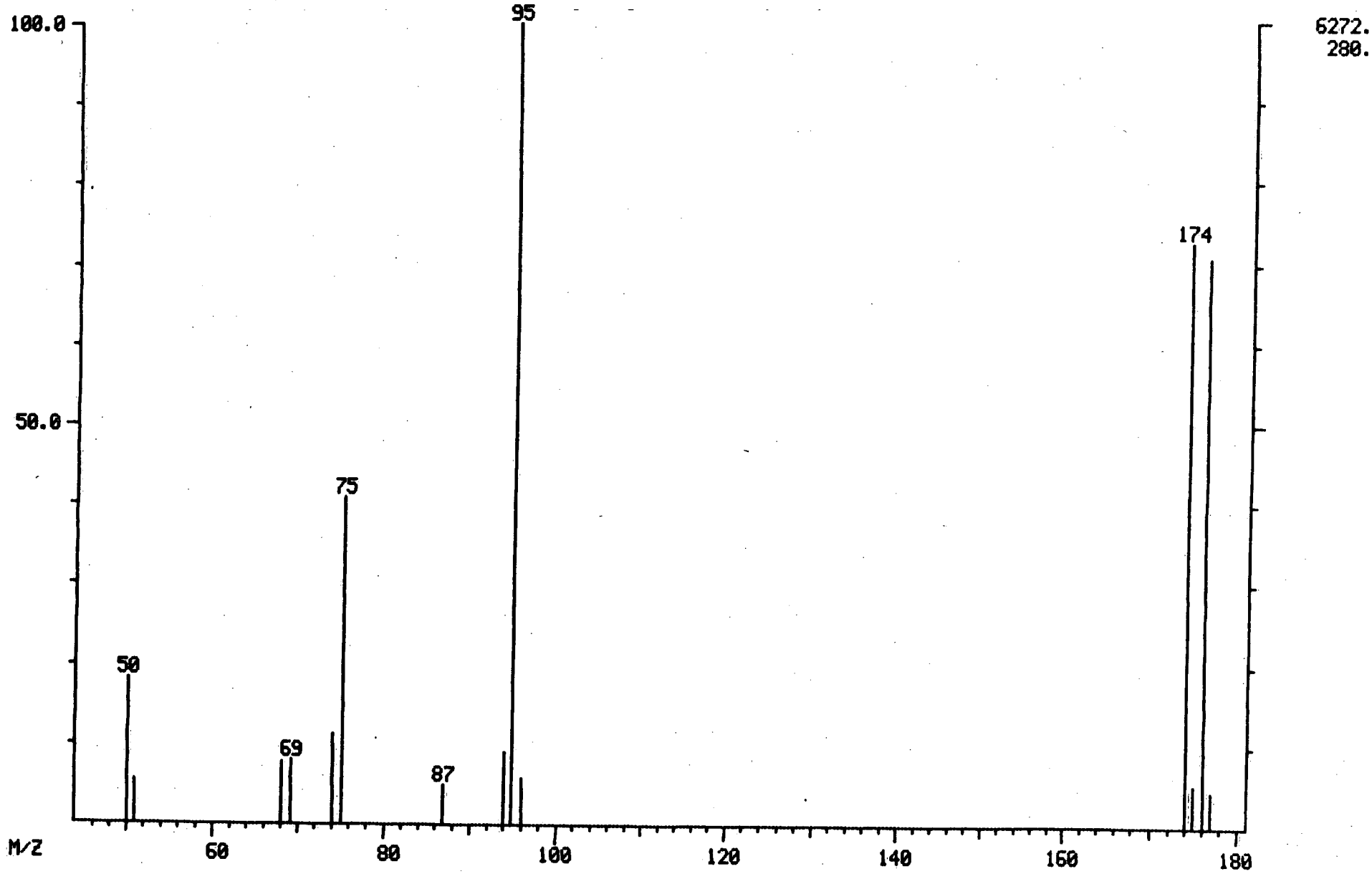
THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

| SAMPLE ID | LAB ID | DATE OF ANALYSIS | TIME OF ANALYSIS |
|---|---|---|---|
| 50 ug/L VOA HSL STD | VOA 5801 | 8/20/87 | 5:21 |
| 2033-6007 (1/10 D.L.) | VOA 5802 | " | 6:09 |
| BLANK | VOA 5803 | " | 6:56 |
| 2033-6010 (1/10 D.L.) | VOA 5804 | " | 7:44 |
| BLANK | VOA 5805 | " | 8:32 |
| 2033-6009 (1/10 D.L.) | VOA 5806 | " | 9:20 |
| BLANK | VOA 5807 | " | 10:07 |
| 2033-6008 (1/10 D.L.) | VOA 5808 | " | 10:55 |
| N/A | VOA 5809 | " | N/A |
| BLANK | VOA 5810 | " | 12:30 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

MID MASS SPECTRUM
08/20/87 5:21:00 + 32:20
SAMPLE: GC/MS#1, @ 50 UG/L VOAHSL STD.
CONDS.: 624
GC TEMP: 239 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: VOA5801 #970
CALI: VOA5801 #2

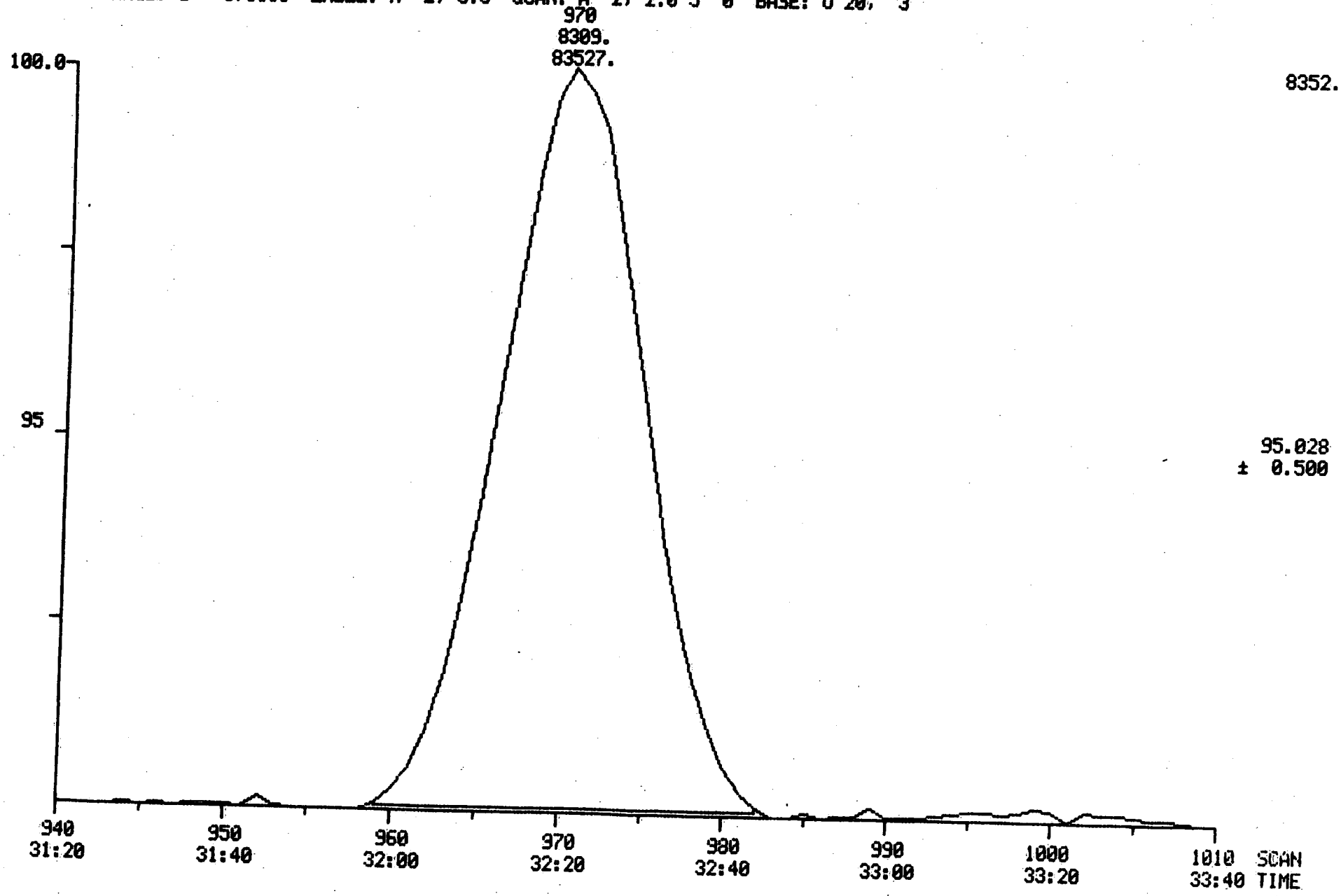
BASE M/Z: 95
RIC: 27424.



MIDMASS CHROMATOGRAM
08/20/87 5:21:00
SAMPLE: GC/MS#1, @ 50 UG/L VOAHSL STD.
CONDS.: 624
RANGE: G 1,1130 LABEL: N 2, 3.0 QUAN: A 2, 2.0 J 0 BASE: U 20, 3

DATA: VOA5801 #970
CALI: VOA5801 #2

SCANS 940 TO 1010



# MASS SPECTRAL DATA

# FOR

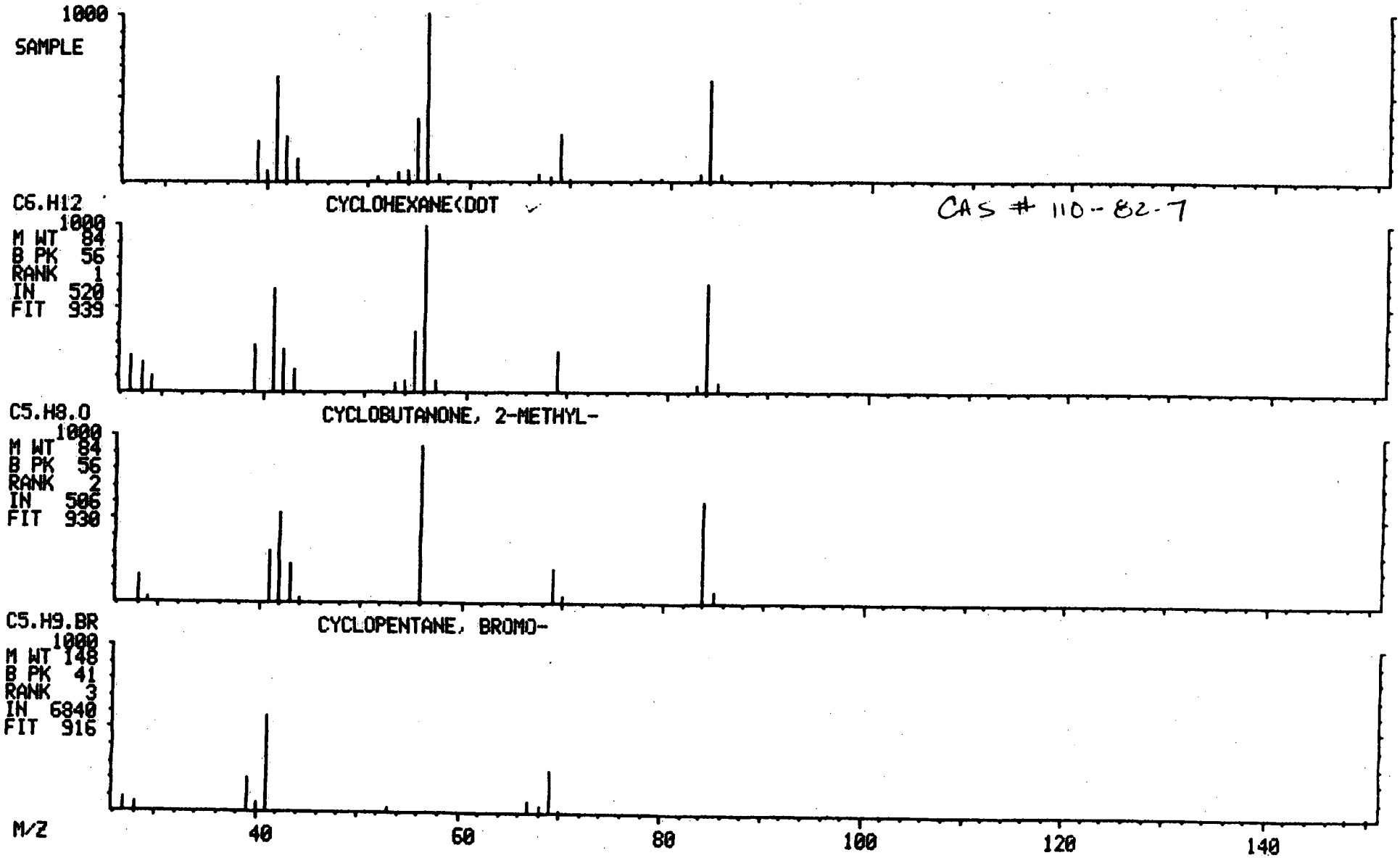
# TENTATIVELY IDENTIFIED COMPOUNDS

For each tentatively identified compound, a mass spectrum of the detected compound is provided with the mass spectrums of the three best matches from the NBS Library search. When the library search does not produce an adequate match, the detected compound is labelled as "unknown".

MID LIBRARY SEARCH
08/20/87 6:09:00 + 17:12
SAMPLE: GC/M531, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 516
CALI: VOA5802 # 2

BASE M/Z: 56
RIC: 68607.

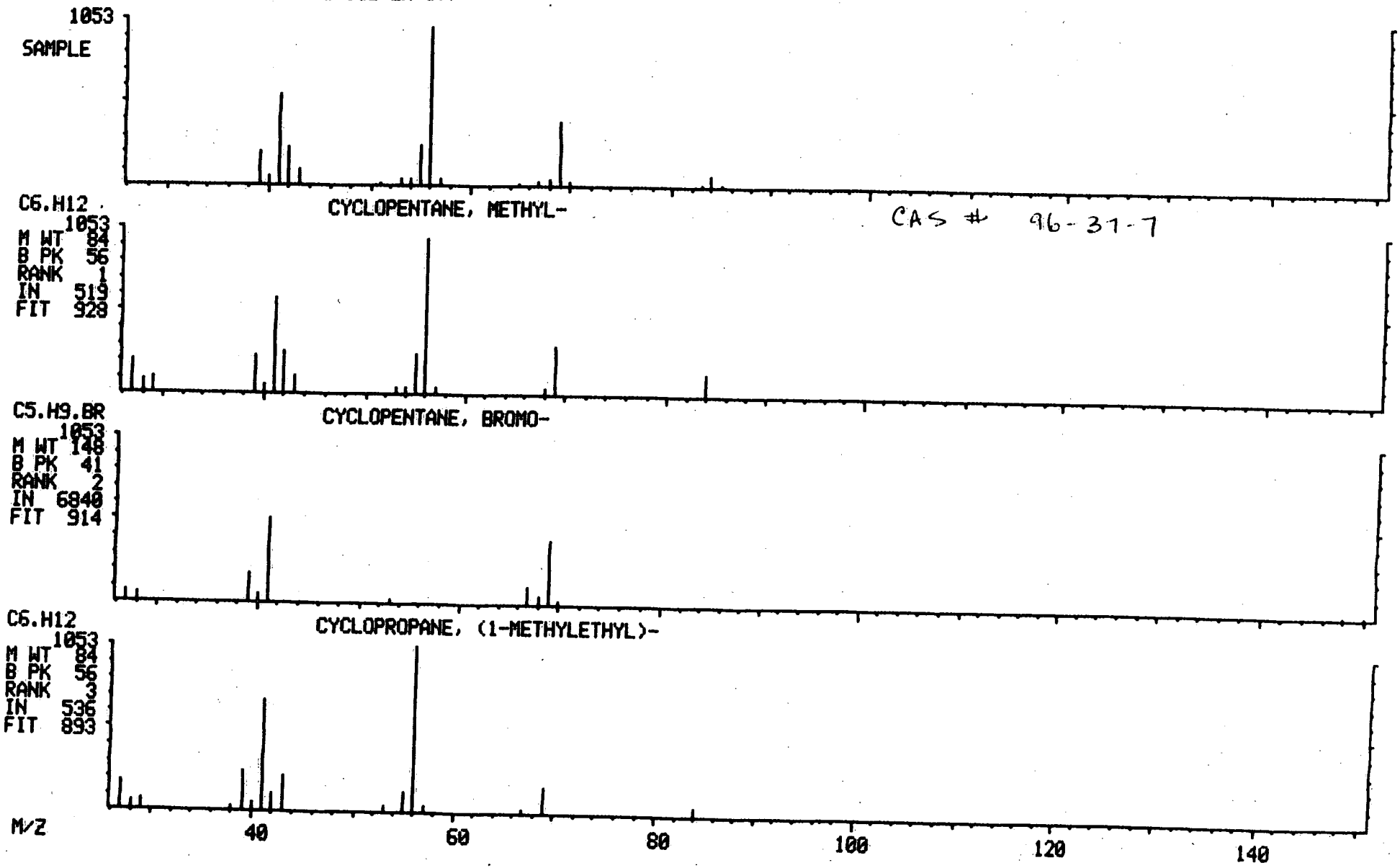



17

MID LIBRARY SEARCH
08/20/87 6:09:00 + 17:50
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 535
CALI: VOA5802 # 2

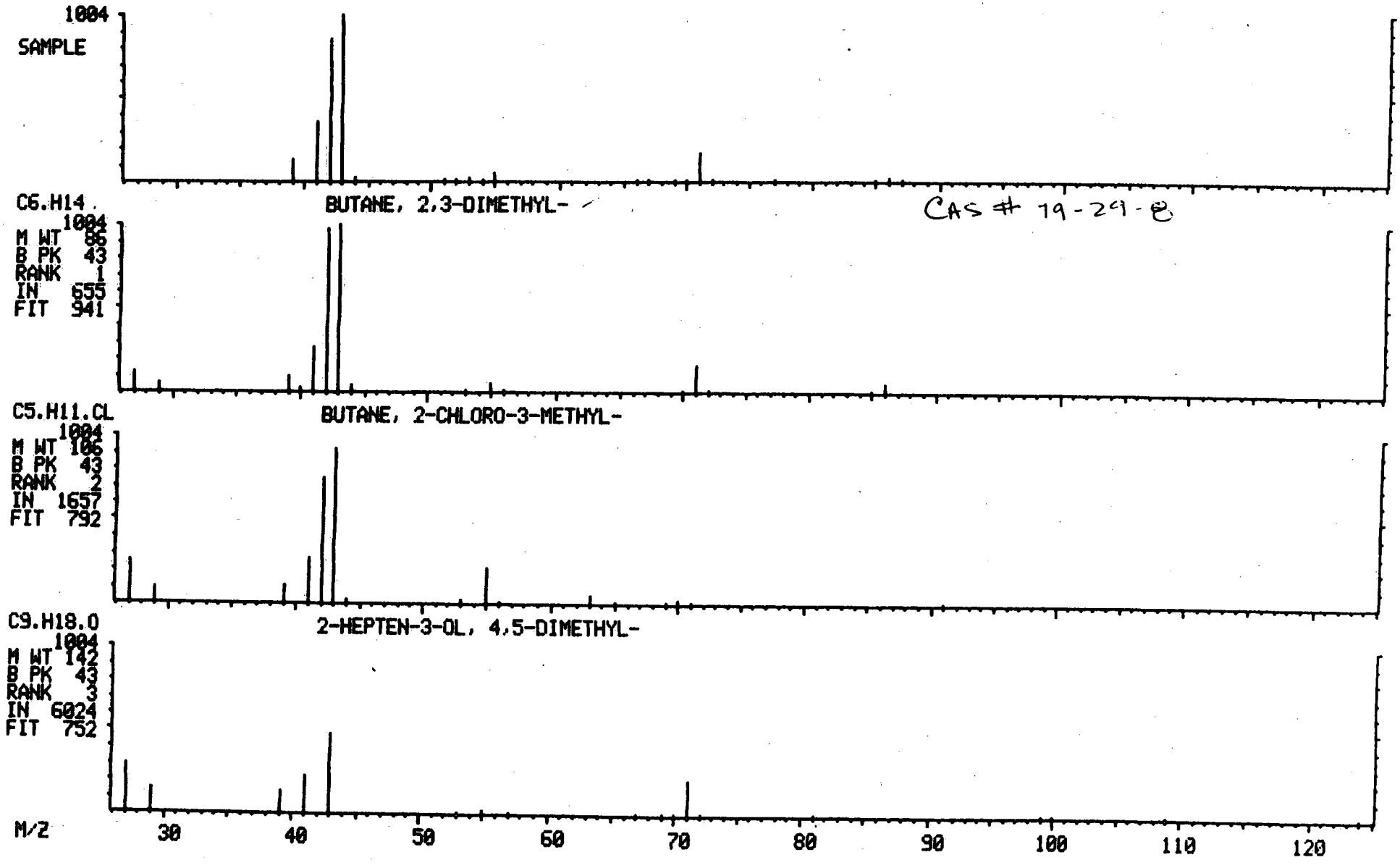
BASE M/Z: 56
RIC: 316927.



MID LIBRARY SEARCH
08/20/87 6:09:00 + 19:00
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 570
CALI: VOA5802 # 2

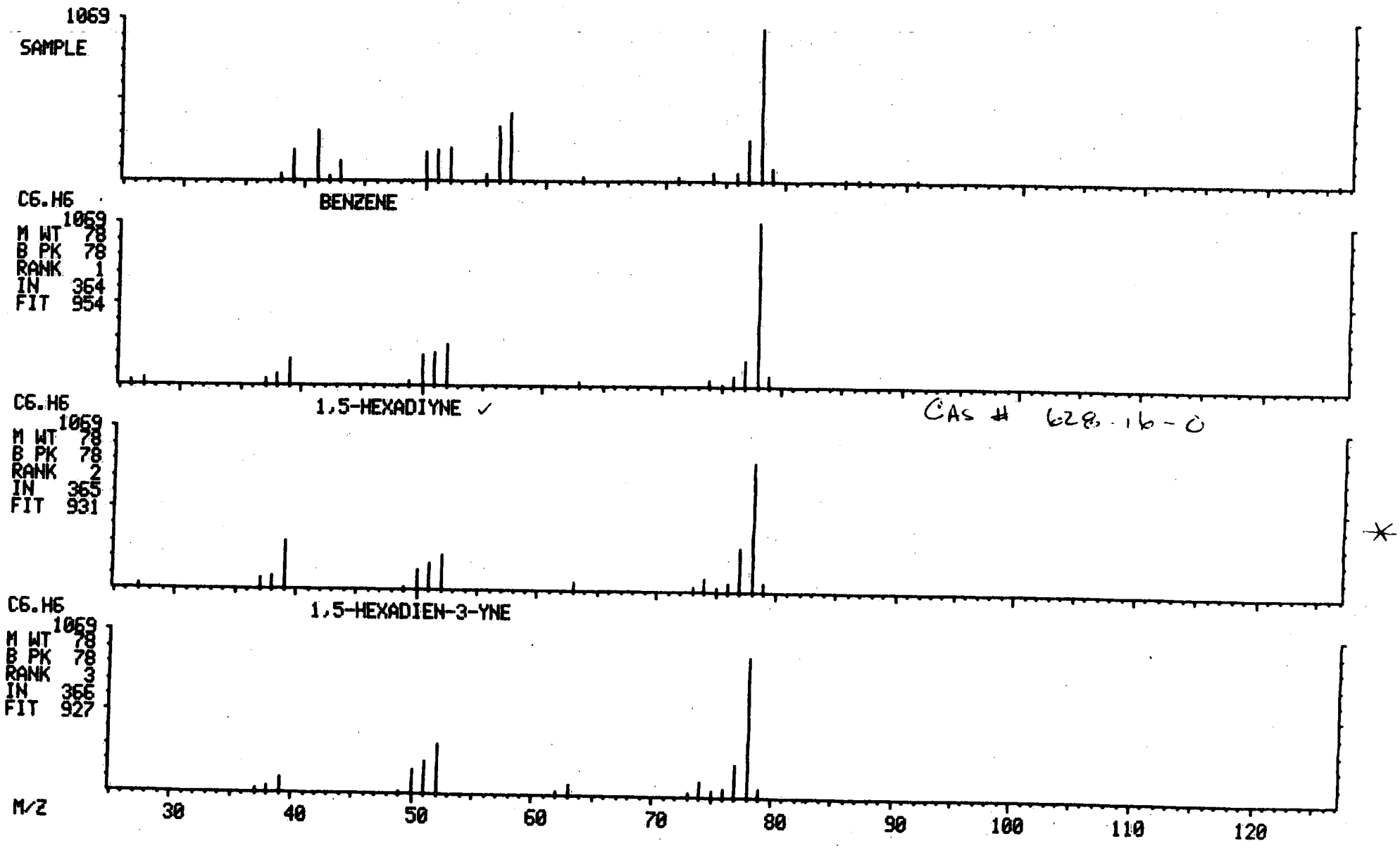
BASE M/Z: 43
RIC: 33215.



MID LIBRARY SEARCH
08/20/87 6:09:00 + 19:48
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 594
CALI: VOA5802 # 2

BASE M/Z: 78
RIC: 505855.

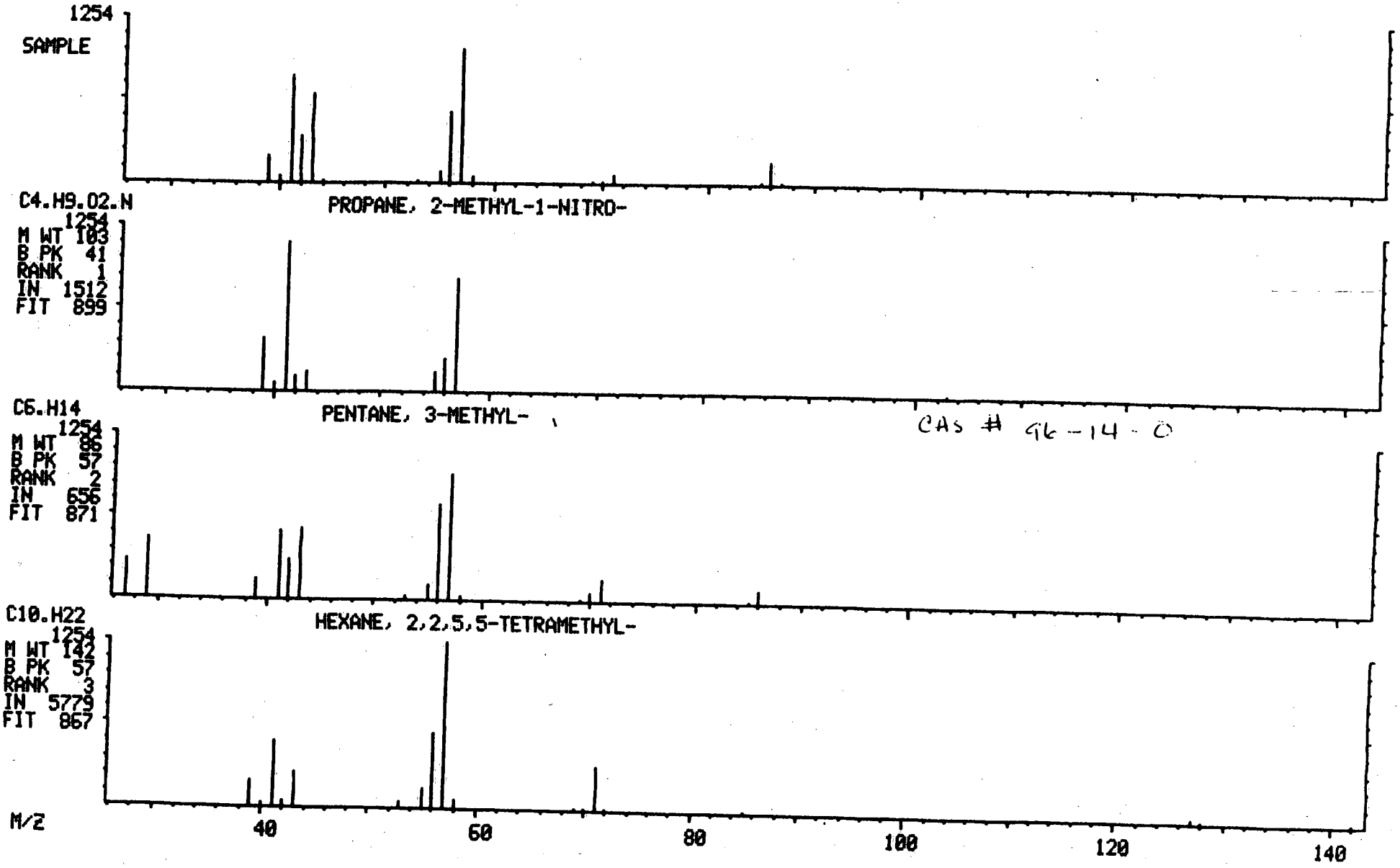



20

MID LIBRARY SEARCH
08/20/87 6:09:00 + 21:36
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (5 15B 2N 0T)

DATA: VOA5802 # 648
CALI: VOA5802 # 2

BASE M/Z: 57
RIC: 688127.



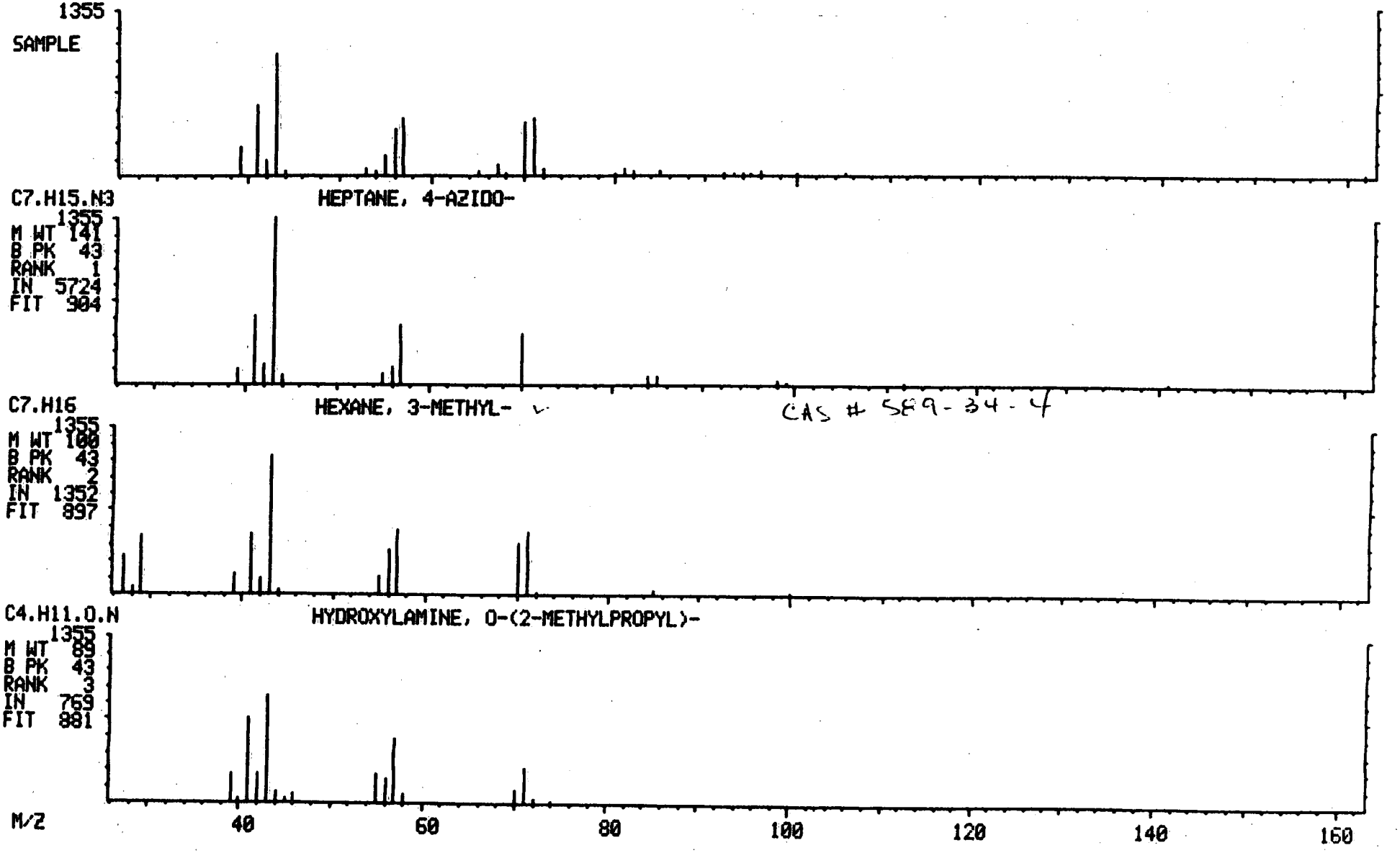

CAS # 96-14-0

21

MID LIBRARY SEARCH
08/20/87 6:09:00 + 24:42
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 741
CALI: VOA5802 # 2

BASE M/Z: 43
RIC: 11423.

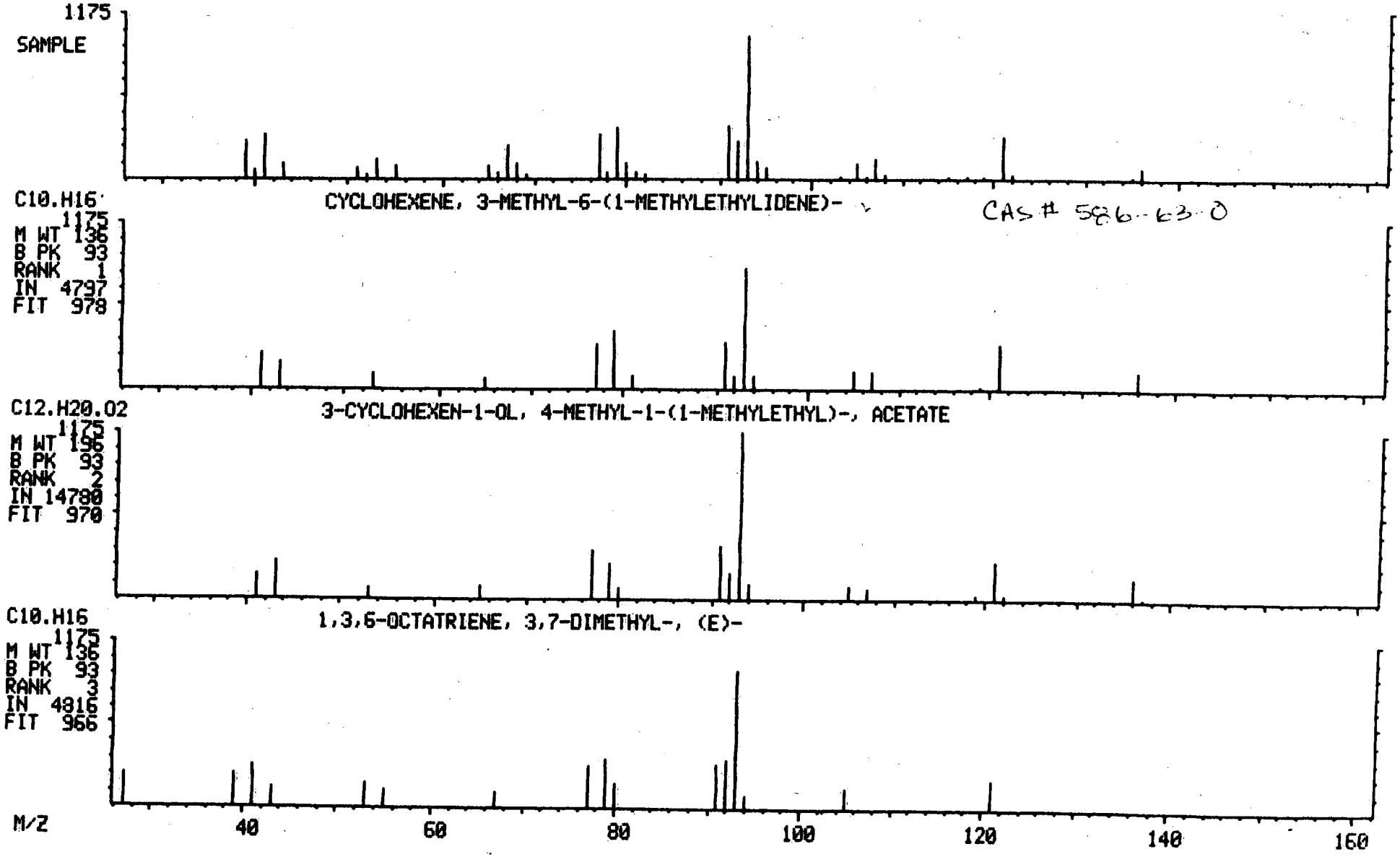



22

MID LIBRARY SEARCH
08/20/87 6:09:00 + 29:14
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 877
CALI: VOA5802 # 2

BASE M/Z: 93
RIC: 31167.

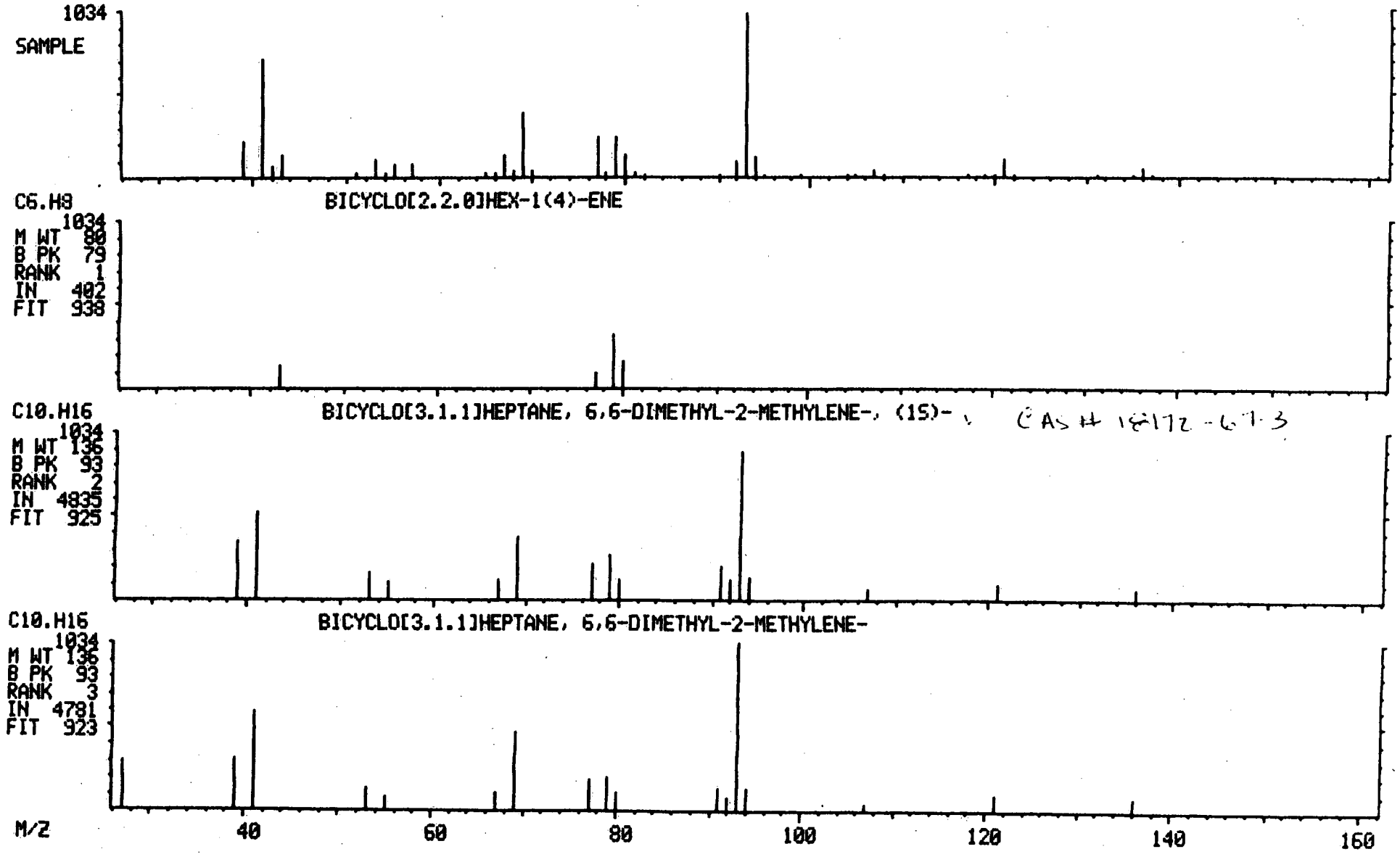



23

MID LIBRARY SEARCH
08/20/87 6:09:00 + 30:06
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 903
CALI: VOA5802 # 2

BASE M/Z: 93
RIC: 29759.



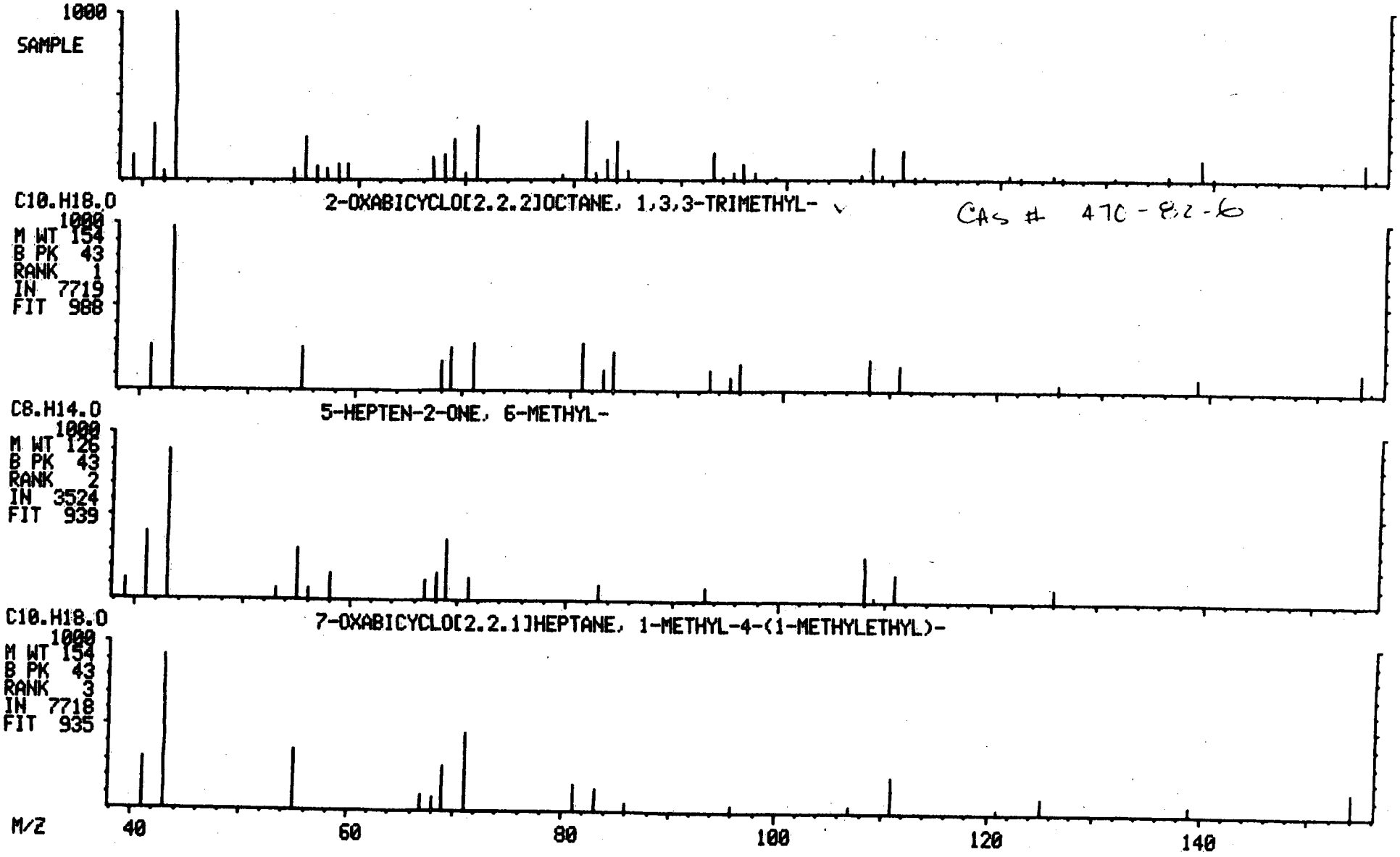

CAS # 18172-67-3

24

MID LIBRARY SEARCH
08/20/87 6:09:00 + 31:50
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 955
CALI: VOA5802 # 2

BASE M/Z: 43
RIC: 36543.

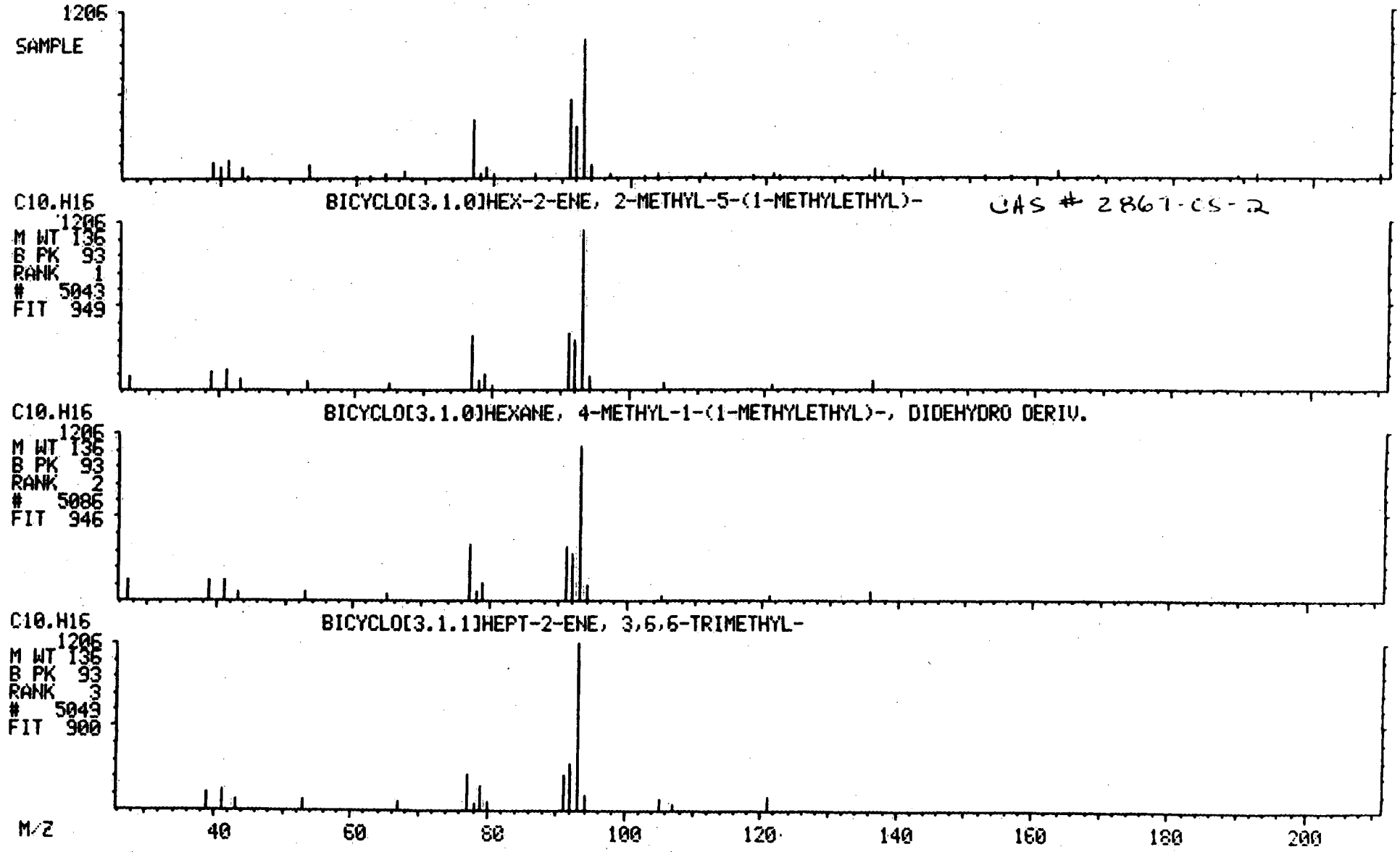



25

MID LIBRARY SEARCH
08/20/87 6:09:00 + 32:54
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 # 987
CALI: VOA5802 # 2

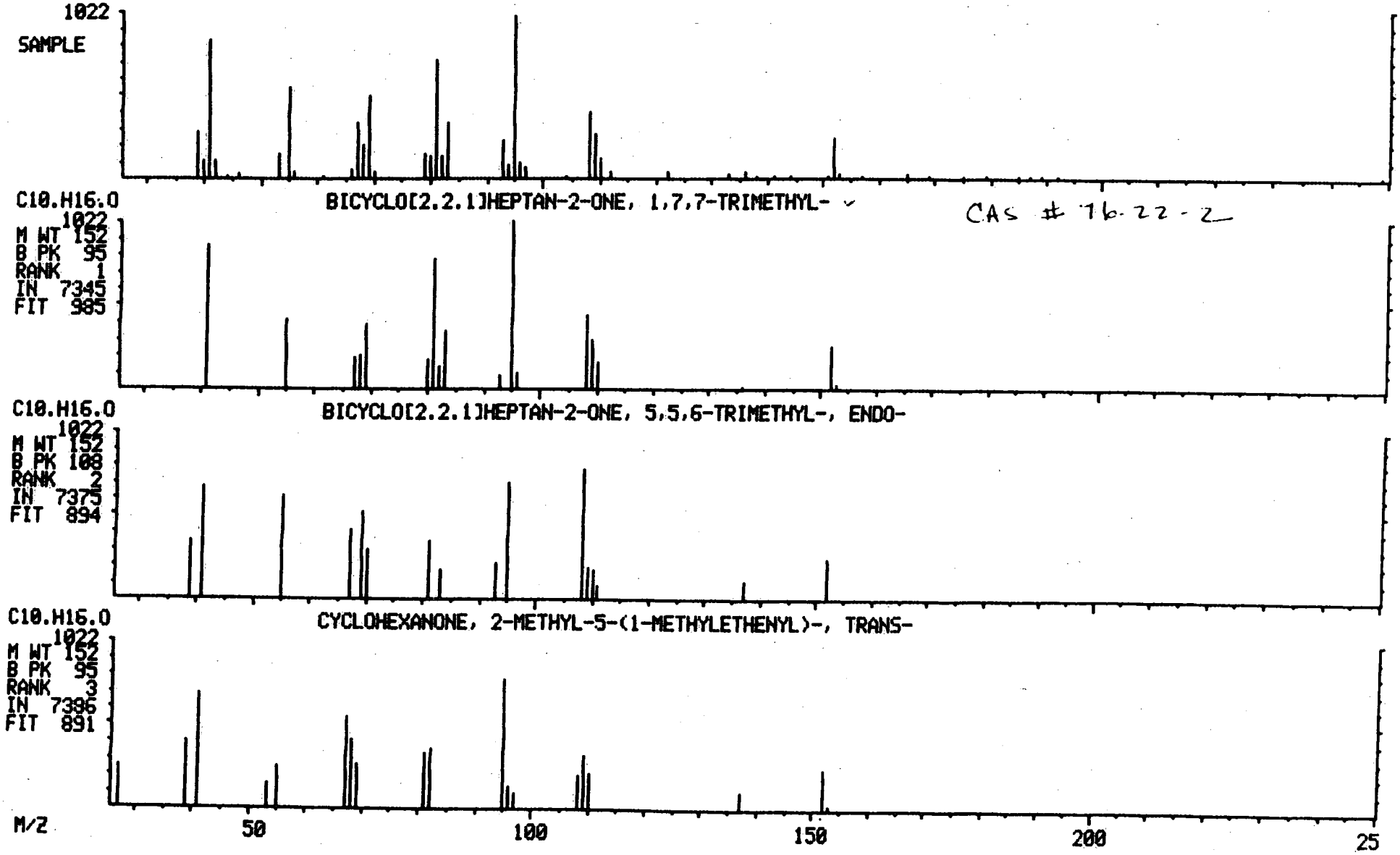
BASE M/Z: 93
RIC: 8119.



MID LIBRARY SEARCH
08/20/87 6:09:00 + 34:18
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 #1029
CALI: VOA5802 # 2

BASE M/Z: 95
RIC: 18015.

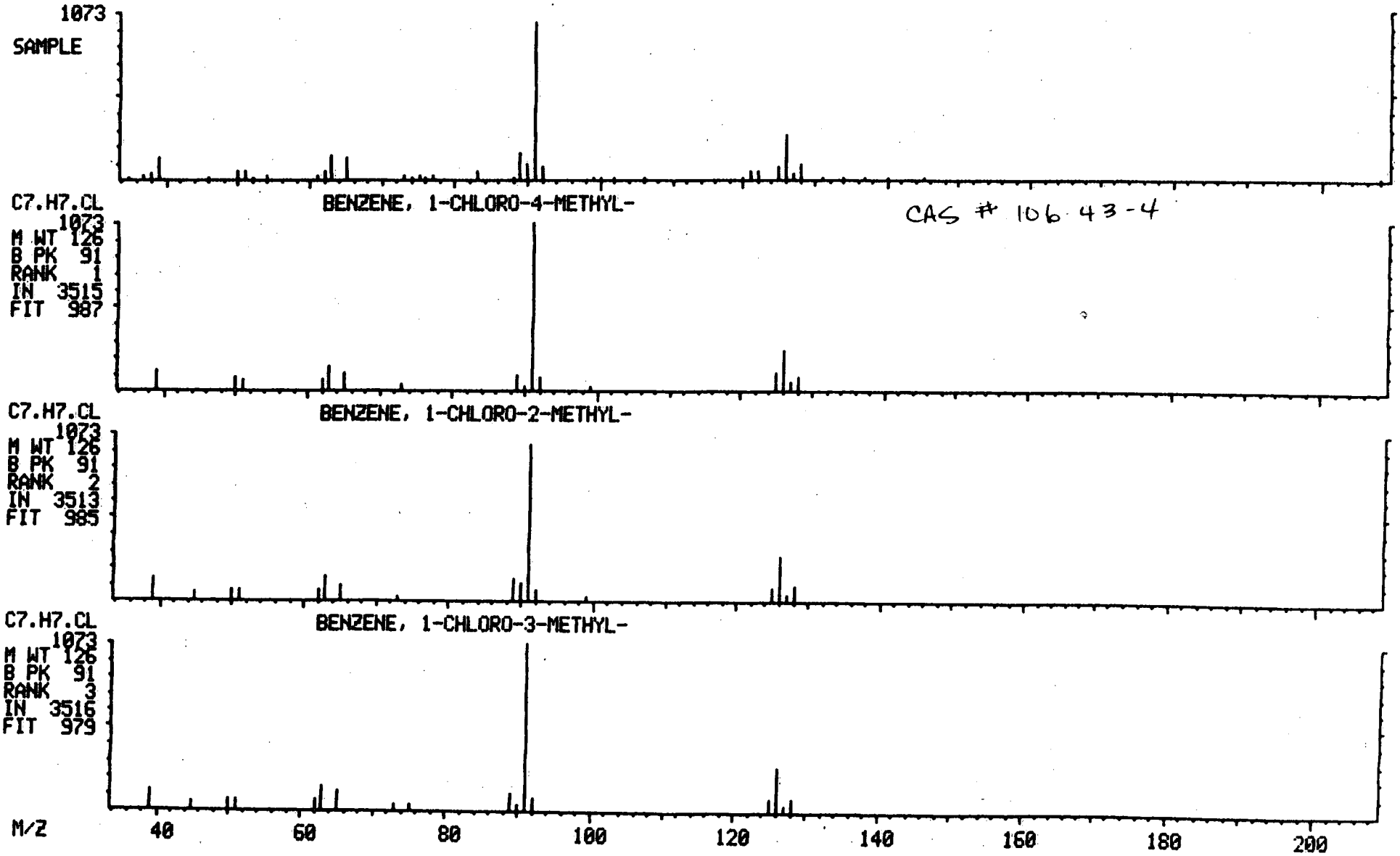



27

MID LIBRARY SEARCH
08/20/87 6:09:00 + 36:34
SAMPLE: GC/MS31, 2033-6007 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5802 #1097
CALI: VOA5802 # 2

BASE M/Z: 91
RIC: 15359.

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# REAGENT BLANK SUMMARY

Case No. _____ Contractor E.T. Killam Assoc Contract No. _____

| FILE ID | DATE OF ANALYSIS | FRACTION | MATRIX | CONC. LEVEL | DIST. ID | CAS NUMBER | COMPOUND (HSL, TIC OR UNKNOWN) | CONC. | UNITS | CRQL |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA 5810 | 8/20/87 | VOA | WATER | Low | 5100 | N/A | Methylene Chloride | 4J | ug/L | 5 |

Comments:

FORM IV



29

# CHAIN OF CUSTODY RECORD

Log Book Pg. No. 10/11

Project Name/Number ORBIS P87-304 | Sample Date: 8-7-87

— See options below

| ETK Lab # Sample # | Sub | Field Sample No. A | B | Time | Sample Location | Sample Depth | Sample Type | No. of Containers | Section / Option: Metals A B C D | GC/MS Organics A B C D | Other Organics A B C D | Nutrients A B C D | S.D.W.A. | Solids | Bacty | TC/FC | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | P304 | 6007 | 11:20 | OB-4 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | ALL SAMPLES |
| | | P304 | 6008 | 11:35 | OB-7 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | OBTAINED FROM |
| | | P304 | 6009 | 11:50 | OB-8 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | TEST PITS IN |
| | | P304 | 6010 | 12:00 | OB-5 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | U.G. STORAGE |
| | | | | | | | | | | | | | | | | | TANK (REMOVED) AREA |

| Metals -M- | GC/MS Organics -G- | Organics (Other) -Q- | Nutrients - Minerals -N- | S.D.W.A. Conven. Analysis -S- | Solid Series / pH Conductivity |
|---|---|---|---|---|---|
| **"A" Priority Metals**<br>As Sb Be Cd<br>Cr Cu Pb Hg<br>Ni Se Ag Tl<br>Zn | **"A" P.P. + 40**<br>VOAs + 15<br>A/BNs + 25<br>Pesticides & PCBs | **"A" PHC**<br>Petroleum Hydrocarbons | **"A" Nutrients**<br>Ammonia<br>Nitrate<br>Nitrite<br>Total Phosphorus<br>TKN | **Primary:**<br>$Fl^-$ Turb. $NO_3$-N<br>**Secondary:**<br>pH TDS Alk.<br>Hardness L.I. $SO_4$<br>$Cl^-$ $F^-$ M.B.A.S. | TS TDS<br>TSS TVDS<br>pH TVSS<br>Conductivity |
| **"B" S.D.W.A.**<br>**Primary:**<br>As Ba Cd Cr<br>Pb Na Hg Se Ag<br>**Secondary:**<br>Cu Fe Mn Zn | **"B" P.P. — No Searches**<br>VOAs<br>A/BNs<br>Pesticides & PCBs | **"B" O & G**<br>Oil & Grease | **"B" Minerals**<br>Alk. $Cl^-$<br>pH $F^-$<br>Hard. $SO_4$<br>L.I. Turb. | | |
| **"C" Misc. Metals**<br>Cr+6 Fe Mn<br>Na Ba K<br>Ca Mg | **"C" VOAs only**<br>A. Searches<br>B. No Searches<br>C. Specific: _____ | **"C" Total Phenols**<br>Total Phenols | **"C" Oxygen Demand**<br>B.O.D. C.O.D.<br>A. Total<br>B. Soluable | | |
| **"D" List (others)** | **"D" A-280**<br>A-280 Parameters<br>S.D.W.A. | **"D" Cyanide**<br>Cyanide | **"D" Misc. List** | | |

| Bottles/Samplers Prepared by: | Date | Time |
|---|---|---|
| KAA | 8/6/87 | 1000 |
| **Sampled by:** | **Date** | **Time** |
| KE Kah | 8/7/87 | see Above |
| **Received by:** | **Date** | **Time** |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| **Lab. Received by:** | **Date** | **Time** |
| J Sanderson | 8/7/87 | 1345 |

2033

2 of 3

30

**Elson T. Killam Associates, Inc.**

27 Bleeker Street, P.O. Box 1008, Millburn, NJ 07041
Tel. 201/379-3400 Telex 642-057 Telecopier 201/376-1072

Environmental and Hydraulic Engineers

# ANALYTICAL DATA REPORT

**ORBIS PRODUCTS CORP.**

**NEWARK, NEW JERSEY**

**U.G. STORAGE TANK AREA**

**PROJECT NUMBER:** P87-304

**LABORATORY REFERENCE NUMBER:** 2033-6008

**DATE AND TIME COLLECTED:** 8/7/87 11:35

Nancy J. Potak
LABORATORY DIRECTOR

SEPTEMBER 24, 1987

N.J. LABORATORY
CERTIFICATION NO.: 07059

Elson T. Killam Associates, Inc.

# LABORATORY CHRONICLE

**LABORATORY SAMPLE NO.:** 2033-6008

**RECEIVED:** 8/7/87

**ORGANICS:**

**EXTRACTION:**

**ANALYSES:**

1. **VOLATILE COMPOUNDS:** 8/20/87
2. **ACID EXTRACTABLES:**
3. **BASE/NEUTRALS:**
4. **PESTICIDES/PCBs:**

**METALS:**

**DIGESTION:**

**ANALYSES:**

| OTHER ANALYSES: | EXTRACTED: | ANALYSES: |
|---|---|---|
| PHC | 8/13/87 | 8/14/87 |

**QUALITY CONTROL SUPERVISOR**
**REVIEW AND APPROVAL:**

# METHODOLOGY SUMMARY

**Purgeable Organics**

USEPA METHOD 624

**Acid Extractables**

**Base/Neutral Extractables**

**PESTICIDE EXTRACTABLES**

**Metals**

**Total Cyanide**

**Total Phenol**

**Other** PHC - USEPA METHOD 418.1 (Modified for soil)

# PETROLEUM HYDROCARBONS DATA

LABORATORY SAMPLE NO.: 2033-6008

| | CONCENTRATION DRY WEIGHT (mg/Kg) | DETECTION LIMIT (mg/Kg) |
|---|---|---|
| PETROLEUM HYDROCARBONS | 3,070 | 130 |

BDL = BELOW DETECTION LIMIT

## PETROLEUM HYDROCARBONS
## MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

**LAB REFERENCE ID NO.:** 2033-6008 **QUALITY ASSURANCE SAMPLE:** 2033-6006

| LAB SAMPLE NO. | CONC. SPIKE ADDED | SAMPLE CONC. | CONC. MS | % REC | CONC. MSD | % REC | RPD |
|---|---|---|---|---|---|---|---|
| 2033-6006..... | 610 | <30 | 612 | 100 | 632 | 104 | 4 |

Concentration - mg/kg
RPD - relative percent difference

## DATA QUALIFIERS

The following four qualifiers are used in the analytical report package. They are equivalent to those issued by EPA - Contract Laboratory Program:

U - Indicates that the compound was analyzed for but not detected. All sample detection limits reported have been corrected for dilution and per cent moisture. No adjustements for blank contamination have been made.

J - Refers to an estimated value. This is used when the mass spectral data indicates the presence of a compound that meets the identification criteria, yet has a concentration less than the contract required detection limit. All estimated values reported have been adjusted for both dilution and per cent moisture, but no corrections have been made for possible blank contamination.

B - This flag is used to note that the compound was found to be present in the laboratory blank as well as in the sample. It indicates that the possibility of laboratory contamination exists.

The EPA has issued certain guidelines to aid in the evaluation of data when common laboratory artifacts occur. Blank contribution is considered to be negligable if it is ten times less than the concentration present in the sample. If the concentrations of the compounds found in both the sample and the blank are comparable (i.e. sample concentration is less than twice that of the blank), the occurance of the compound in the sample is considered to be suspect.

Up to 25 ppb of methylene chloride is permitted to be present in the blanks of volatile organic analyses.

C - Applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ul in the final extract are confirmed by GC/MS.

The next qualifier is also used in referencing the analytical results:

X - This flag indicates the presence of a compound which is often found as a common laboratory or field contaminant.

# VOLATILE COMPOUNDS DATA

**LABORATORY SAMPLE NO.:** 2033-6008( 1/10 DIL ) **DATA FILE NO.:** VOA5808

**% SOLIDS:** 77.6

| | CONCENTRATION (ug/Kg) | | SCAN | DETECTION LIMIT (ug/Kg) |
|---|---|---|---|---|
| ACROLEIN | | U | | 1300. |
| ACRYLONITRILE | | U | | 1300. |
| BENZENE | 4900 | | 605 | 64. |
| BROMOFORM | | U | | 64. |
| BROMOMETHANE | | U | | 130. |
| CARBON TETRACHLORIDE | | U | | 64. |
| CHLOROBENZENE | | U | | 64. |
| DIBROMOCHLOROMETHANE | | U | | 64. |
| CHLOROETHANE | | U | | 130. |
| 2-CHLORO ETHYL VINYL ETHER | | U | | 130. |
| CHLOROFORM | | U | | 64. |
| CHLOROMETHANE | | U | | 64. |
| BROMODICHLOROMETHANE | | U | | 64. |
| 1,1-DICHLOROETHANE | | U | | 64. |
| 1,2-DICHLOROETHANE | | U | | 64. |
| 1,1-DICHLOROETHENE | | U | | 64. |
| TRANS-1,2-DICHLOROETHENE | | U | | 64. |
| 1,2-DICHLOROPROPANE | | U | | 64. |
| CIS-1,3-DICHLOROPROPENE | | U | | 64. |
| TRANS-1,3-DICHLOROPROPENE | | U | | 64. |
| ETHYLBENZENE | 78 | J | 893 | 64. |
| METHYLENE CHLORIDE | 44 | JB | 281 | 64. |
| 1,1,2,2-TETRACHLOROETHANE | | U | | 64. |
| TETRACHLOROETHENE | | U | | 64. |
| TOLUENE | 4000 | | 797 | 64. |
| 1,1,1-TRICHLOROETHANE | | U | | 64. |
| 1,1,2-TRICHLOROETHANE | | U | | 64. |
| TRICHLOROETHENE | | U | | 64. |
| VINYL CHLORIDE | | U | | 130. |
| ACETONE - HSL | 1500 | | 299 | 130. |
| CARBON DISULFIDE - HSL | | U | | 64. |
| 2-HEXANONE - HSL | | U | | 130. |
| 2-BUTANONE | | U | | 130. |
| 4-METHYL-2-PENTANONE -HSL | | U | | 130. |
| STYRENE - HSL | | U | | 64. |
| TOTAL XYLENES - HSL | 213 | | 1017,1048 | 64. |

Laboratory Name: E.T. Killam Assoc.

Case No

| Sample Number |
|---|
| 2033-6008 |

## Organics Analysis Data Sheet
(Page 4)

### Tentatively Identified Compounds

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. 110-82-7 | Cyclo Hexane < DOT | VOA | 516 | 300 |
| 2. 96-37-7 | Cyclo Pentane, Methyl | VOA | 535 | 660 |
| 3. 79-29-8 | Butane, 2,3-Dimethyl | VOA | 569 | 76 |
| 4. 16747-25-4 | Hexane, 2,2,3-Trimethyl | VOA | 593 | 600 |
| 5. 628-16-0 | 1,5-Hexadiyne | VOA | 599 | 5,100 |
| 6. 96-14-0 | Pentane, 3-Methyl- | VOA | 647 | 1,800 |
| 7. 4889-83-2 | Bicyclo [3.1.1] Hept-2-ene, | | | |
| 8. | 3,6,6-Trimethyl | VOA | 877 | 95 |
| 9. 470-82-6 | 2-Oxabicyclo [2.2.2] Octane, | | | |
| 10. | 1,3,3 Trimethyl | VOA | 954 | 280 |
| 11. 76-22-2 | Bicyclo [2.2.1] Heptan-2-one, | | | |
| 12. | 1,7,7 Trimethyl | VOA | 1030 | 370 |
| 13. 108-41-8 | Benzene, 1-Chloro-3-Methyl | VOA | 1096 | 620 |
| 14. | | | | |
| 15. | | | | |
| 16. | | | | |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. | | | | |
| 21. | | | | |
| 22. | | | | |
| 23. | | | | |
| 24. | | | | |
| 25. | | | | |
| 26. | | | | |
| 27. | | | | |
| 28. | | | | |
| 29. | | | | |
| 30. | | | | |

# METHOD PERFORMANCE DATA

## SOILS SURROGATE PERCENT RECOVERY

LABORATORY SAMPLE NO.: 2033-6008

| COMPOUND | RECOVERY | EPA CONTROL LIMITS | SCAN # |
|---|---|---|---|
| **VOLATILE FRACTION** | | | |
| TOLUENE - D8 | 60* | 81-117 | 786 |
| BROMOFLUOROBENZENE | 90 | 74-121 | 970 |
| 1,2-DICHLOROETHANE | 88 | 70-121 | 458 |
| **SEMI-VOLATILE FRACTION** | | | |
| NITROBENZENE-D5 | - | 23-120 | - |
| 2-FLUOROBIPHENYL | - | 30-116 | - |
| TERPHENYL-D14 | - | 18-137 | - |
| PHENOL-D5 | - | 24-113 | - |
| 2-FLUOROPHENOL | - | 26-121 | - |
| 2,4,6-TRIBROMOPHENOL | - | 19-122 | - |
| **PESTICIDE** | | | |
| DIBUTYL CHLORENDATE | - | 20-150** | - |

*LOW SURROGATE RECOVERY DUE TO MATRIX EFFECT OF HIGH CONCENTRATION OF TOLUENE IN THE SAMPLE.
**ADVISORY LIMITS ONLY

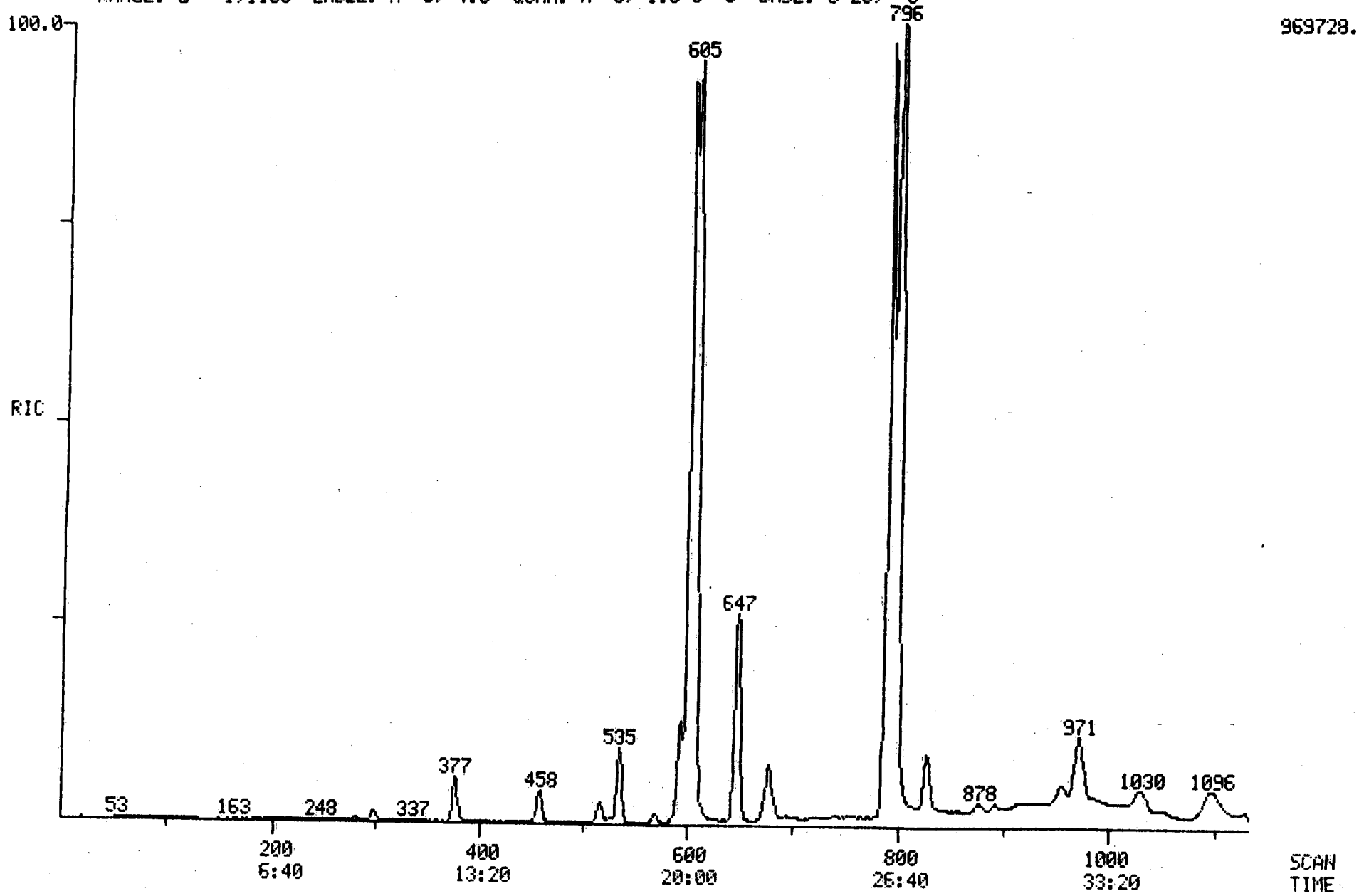
# INTERNAL STANDARD SCAN LIST
## (RETENTION TIME)

LABORATORY SAMPLE NO.: 2033-6008

| INTERNAL STANDARD | SCAN # |
|---|---|
| **VOLATILE FRACTION** | |
| BROMOCHLOROMETHANE | 377 |
| 1,4-DIFLUOROBENZENE | 677 |
| CHLOROBENZENE-D5 | 827 |

| SEMI-VOLATILE FRACTION | SCAN # |
|---|---|
| 1,4-DICHLOROBENZENE-D4 | - |
| NAPTHALENE-D8 | - |
| ACENAPTHENE-D10 | - |
| PHENANTHRENE-D10 | - |
| CHRYSENE-D12 | - |
| PERYLENE-D12 | - |

MIDRIC DATA: VOA5808 #1 SCANS 1 TO 1130
08/20/87 10:55:00 CALI: VOA5808 #2
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
RANGE: G 1,1130 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3



# SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Low Level X Medium Level _____

| FRACTION | COMPOUND | CONC. SPIKE ADDED (ug/Kg) | SAMPLE RESULT | CONC. MS | % REC | CONC. MSD | % REC | RPD | QC LIMITS* RPD | QC LIMITS* RECOVERY |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA SMO SAMPLE NO. 2033 6004 | 1,1-Dicholorethene | 50 | 0 | 38 | 76 | 47 | 94 | 10 | 22 | 59-172 |
| | Trichloroethene | 50 | 0 | 40 | 80 | 46 | 92 | 7 | 24 | 62-137 |
| | Chlorobenzene | 50 | 0 | 46 | 92 | 53 | 106 | 7 | 21 | 60-133 |
| | Toluene | 50 | 7 | 43 | 86 | 54 | 108 | 11 | 21 | 59-139 |
| | Benzene | 50 | 3 | 47 | 94 | 53 | 106 | 6 | 21 | 66-142 |
| B/N SMO SAMPLE NO. | 1,2,4-Trichlorobenzene | | | | | | | | 23 | 38-107 |
| | Acenaphthene | | | | | | | | 19 | 31-137 |
| | 2,4 Dinitrotoluene | | | | | | | | 47 | 28-89 |
| | Di-n-Butylphthalate | | | | | | | | 47 | 29-135 |
| | Pyrene | | | | | | | | 36 | 35-142 |
| | N-Nitrosodi-n-Propylamine | | | | | | | | 38 | 41-126 |
| | 1,4-Dichlorobenzene | | | | | | | | 27 | 28-104 |
| ACID SMO SAMPLE NO. | Pentachlorophenol | | | | | | | | 47 | 17-109 |
| | Phenol | | | | | | | | 35 | 26-90 |
| | 2-Chlorophenol | | | | | | | | 50 | 25-102 |
| | 4-Chloro-3-Methylphenol | | | | | | | | 33 | 26-103 |
| | 4-Nitrophenol | | | | | | | | 50 | 11-114 |
| PEST SMO SAMPLE NO. | Lindane | | | | | | | | 50 | 46-127 |
| | Heptachlor | | | | | | | | 31 | 35-130 |
| | Aldrin | | | | | | | | 43 | 34-132 |
| | Dieldrin | | | | | | | | 38 | 31-134 |
| | Endrin | | | | | | | | 45 | 42-139 |
| | 4,4'-DDT | | | | | | | | 50 | 23-134 |

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 0 out of 5 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

RECOVERY: VOAs 0 out of 10 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

Comments: _____

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# GC/MS TUNING AND MASS CALIBRATION

## Bromofluorobenzene (BFB)

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Instrument ID 5100 Date 8/20/87 Time 5:21 + 32:20

Lab ID VOA 5801 Data Release Authorized By: JEF

| m/e | ION ABUNDANCE CRITERIA | %RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of the base peak | 18.11 |
| 75 | 30.0 - 60.0% of the base peak | 40.94 |
| 95 | Base peak, 100% relative abundance | 100.00 |
| 96 | 5.0 - 9.0% of the base peak | 5.76 |
| 173 | Less than 1.0% of the base peak | <1 |
| 174 | Greater than 50.0% of the base peak | 72.58 |
| 175 | 5.0 - 9.0% of mass 174 | 5.20 (7.16)[1] |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 70.66 (97.4)[1] |
| 177 | 5.0 - 9.0% of mass 176 | 4.48 (6.34)[2] |

[1] Value in parenthesis is % mass 174.
[2] Value in parenthesis is % mass 176.

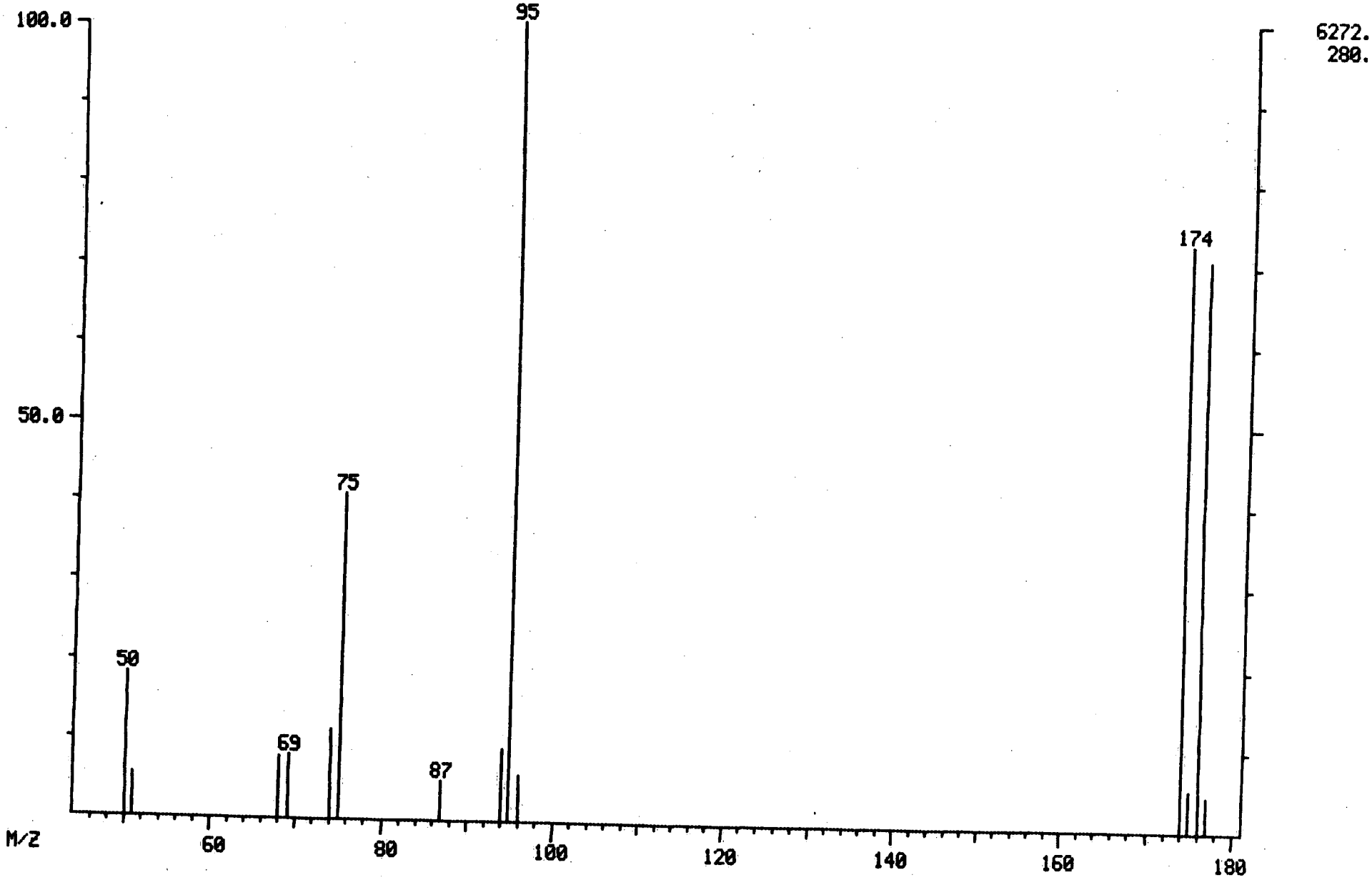
THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

| SAMPLE ID | LAB ID | DATE OF ANALYSIS | TIME OF ANALYSIS |
|---|---|---|---|
| 50 ug/L VOA HSL STD | VOA 5801 | 8/20/87 | 5:21 |
| 2033-6007 (1/10 D.L.) | VOA 5802 | " | 6:09 |
| BLANK | VOA 5803 | " | 6:56 |
| 2033-6010 (1/10 D.L.) | VOA 5804 | " | 7:44 |
| BLANK | VOA 5805 | " | 8:32 |
| 2033-6009 (1/10 D.L.) | VOA 5806 | " | 9:20 |
| BLANK | VOA 5807 | " | 10:07 |
| 2033-6008 (1/10 D.L.) | VOA 5808 | " | 10:55 |
| N/A | VOA 5809 | " | N/A |
| BLANK | VOA 5810 | " | 12:30 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

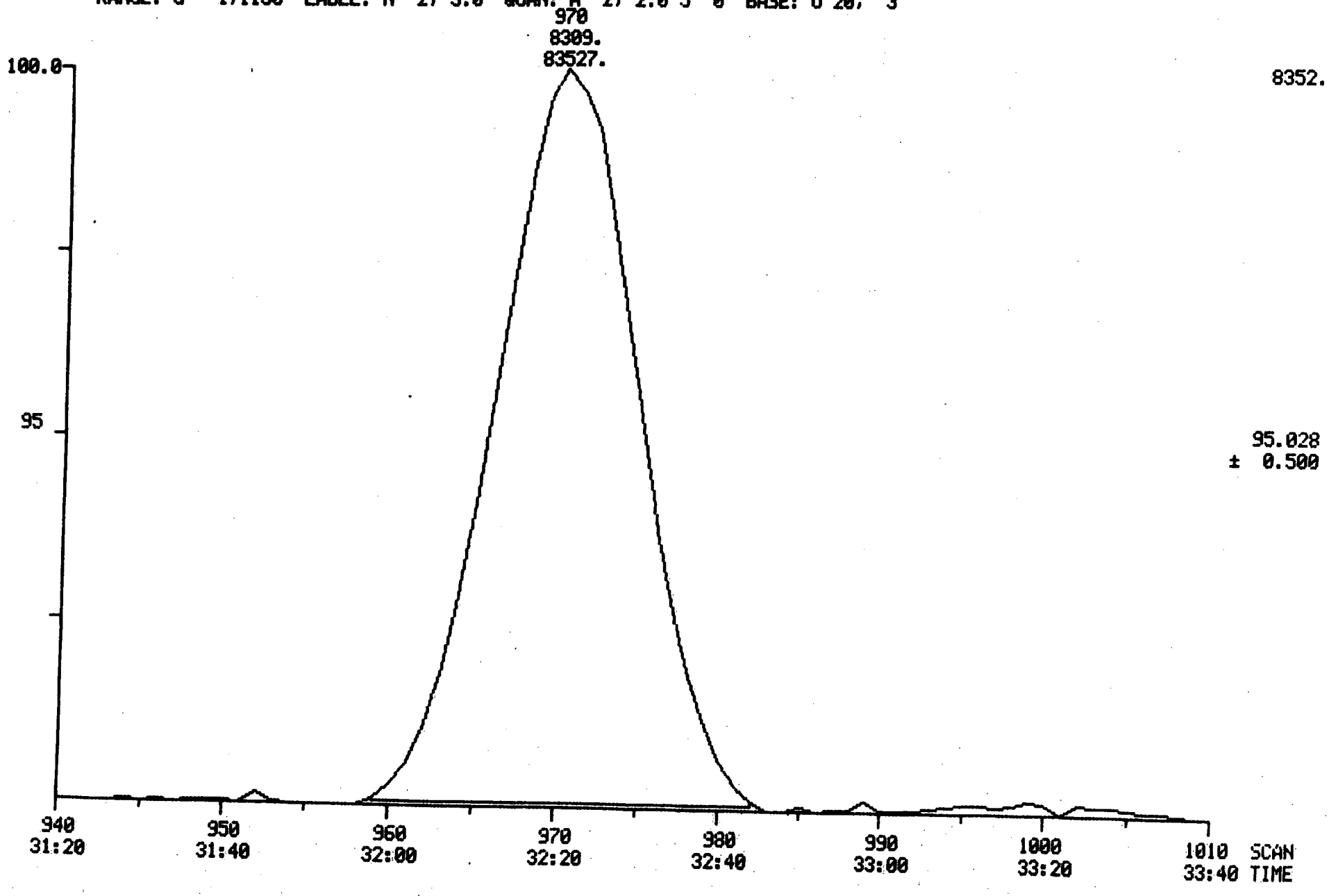
MID MASS SPECTRUM
08/20/87 5:21:00 + 32:20
SAMPLE: GC/MS#1, @ 50 UG/L VOAHSL STD.
CONDS.: 624
GC TEMP: 239 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: VOA5801 #970
CALI: VOA5801 #2

BASE M/Z: 95
RIC: 27424.



MIDMASS CHROMATOGRAM DATA: VOA5801 #970 SCANS 940 TO 1010
08/20/87 5:21:00 CALI: VOA5801 #2
SAMPLE: GC/MS#1, @ 50 UG/L VOAHSL STD.
CONDS.: 624
RANGE: G 1,1130 LABEL: N 2, 3.0 QUAN: A 2, 2.0 J 0 BASE: U 20, 3

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# MASS SPECTRAL DATA

# FOR

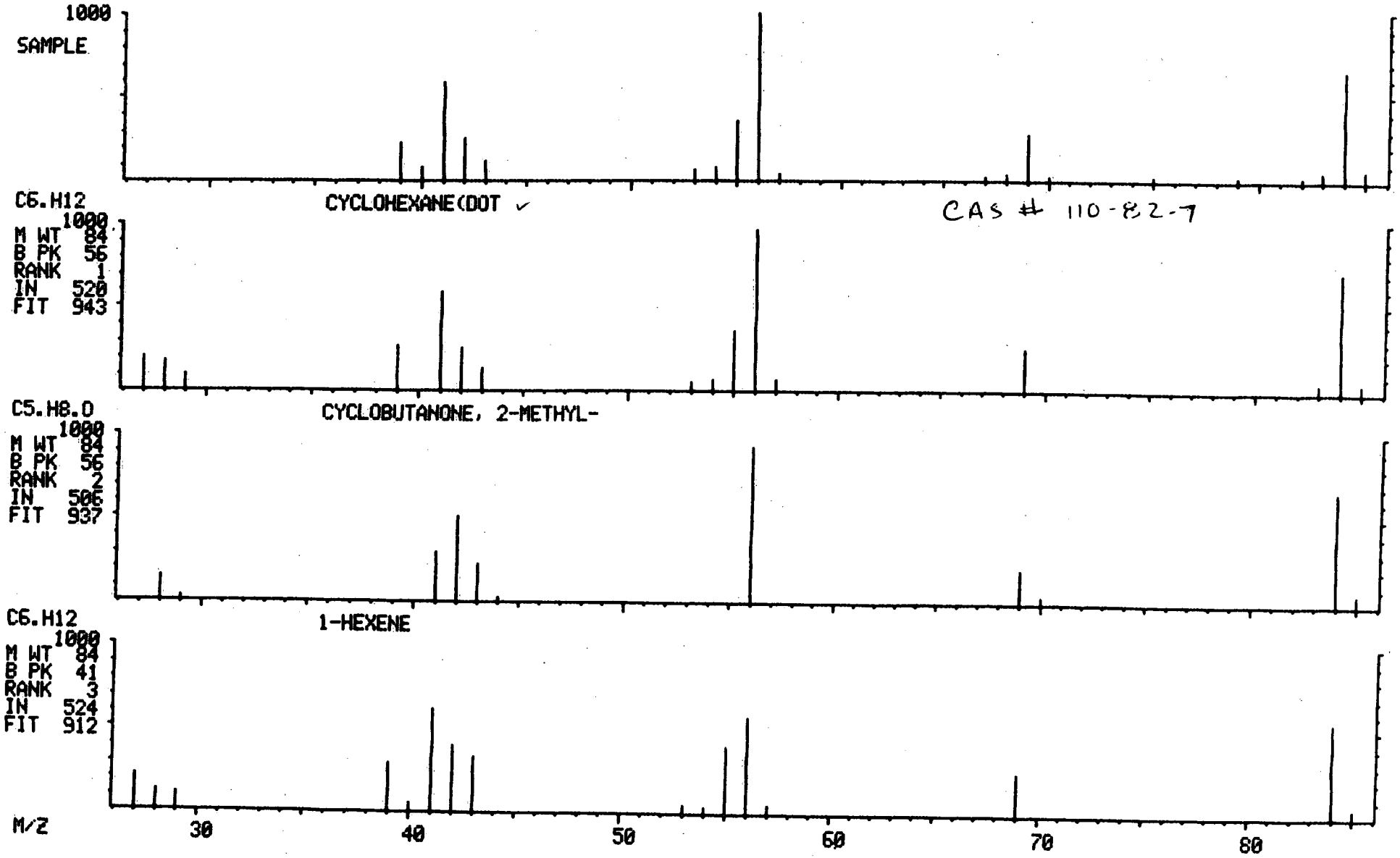
# TENTATIVELY IDENTIFIED COMPOUNDS

For each tentatively identified compound, a mass spectrum of the detected compound is provided with the mass spectrums of the three best matches from the NBS Library search. When the library search does not produce an adequate match, the detected compound is labelled as "unknown".

MID LIBRARY SEARCH
08/20/87 10:55:00 + 17:12
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 # 516
CALI: VOA5808 # 2

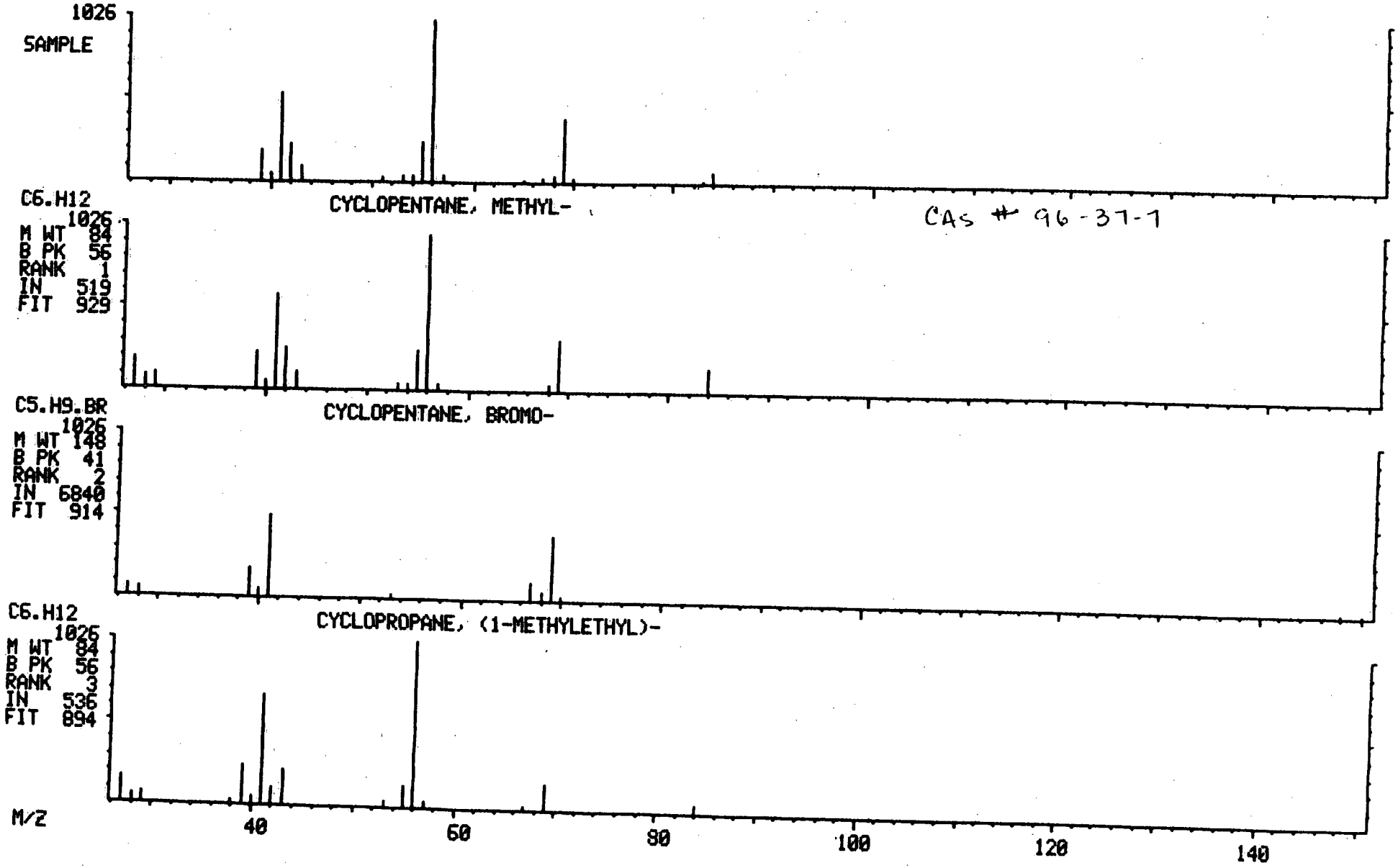
BASE M/Z: 56
RIC: 19839.



MID LIBRARY SEARCH
08/20/87 10:55:00 + 17:50
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 # 535
CALI: VOA5808 # 2

BASE M/Z: 56
RIC: 84479.

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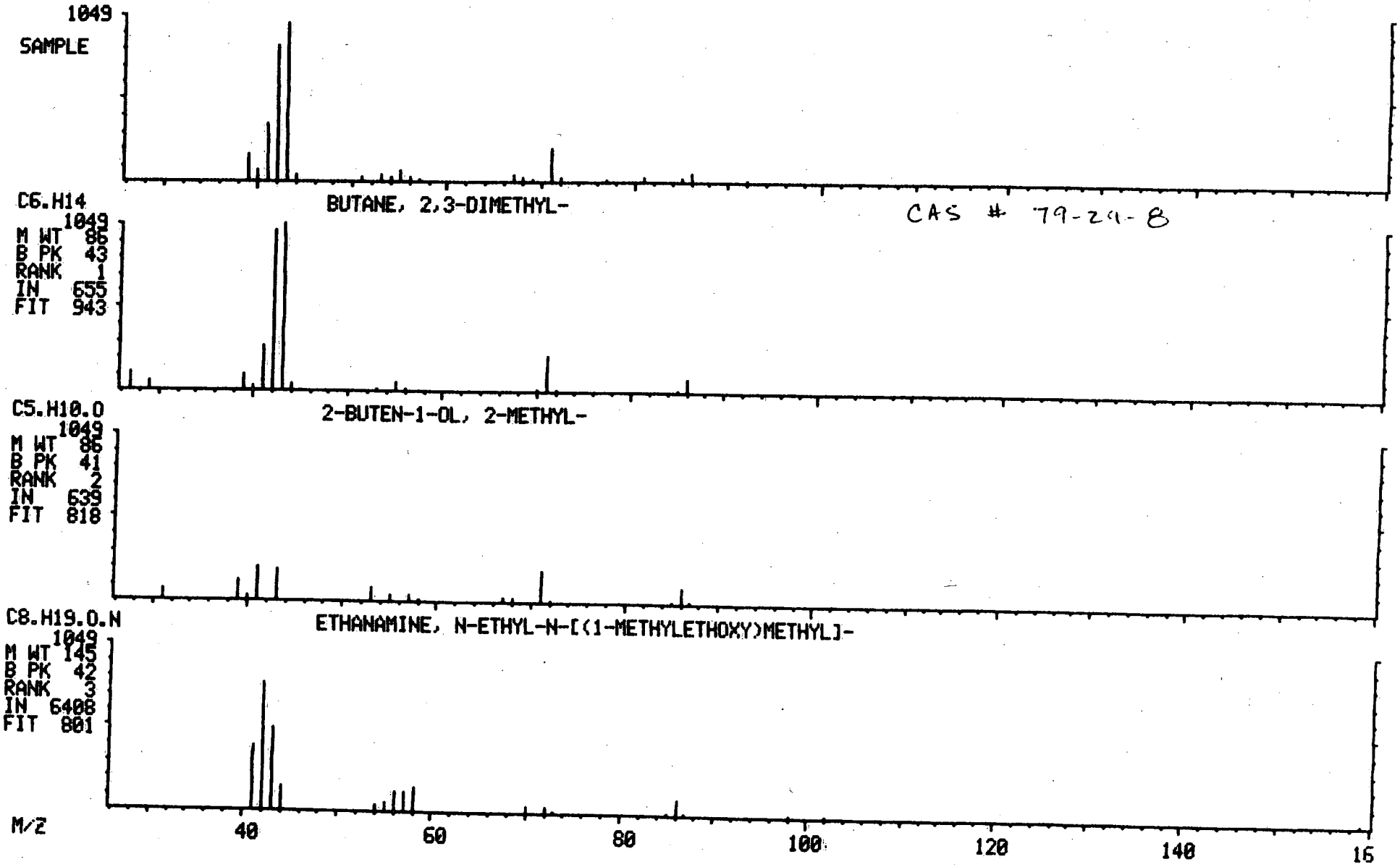
MID LIBRARY SEARCH
08/20/87 10:55:00 + 18:58
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 # 569
CALI: VOA5808 # 2

BASE M/Z: 43
RIC: 10207.

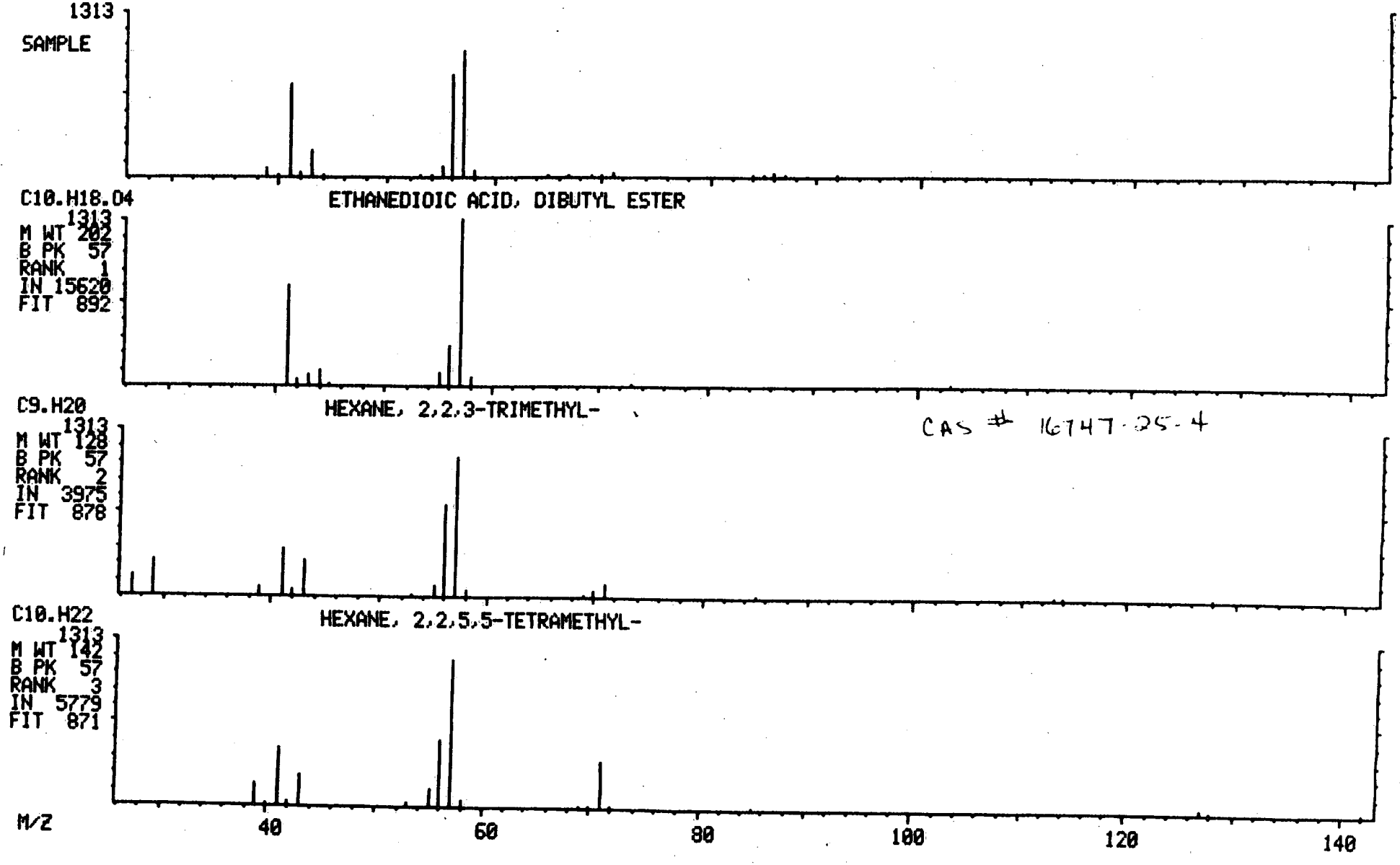



49

MID LIBRARY SEARCH
08/20/87 10:55:00 + 19:46
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 # 593
CALI: VOA5808 # 2

BASE M/Z: 57
RIC: 102527.



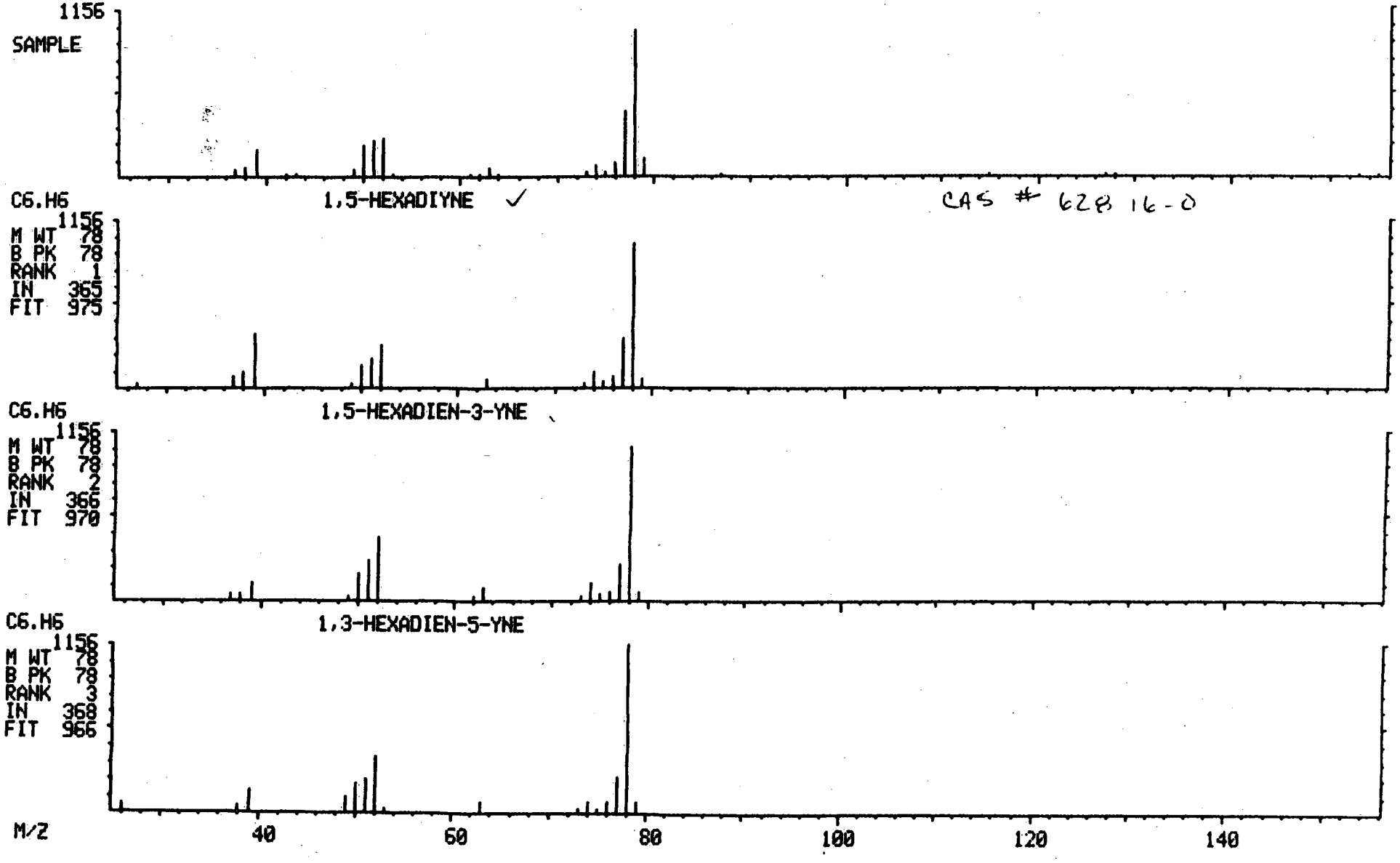

CAS # 16747-25-4

50

MID LIBRARY SEARCH
08/20/87 10:55:00 + 19:58
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 # 599
CALI: VOA5808 # 2

BASE M/Z: 78
RIC: 317951.

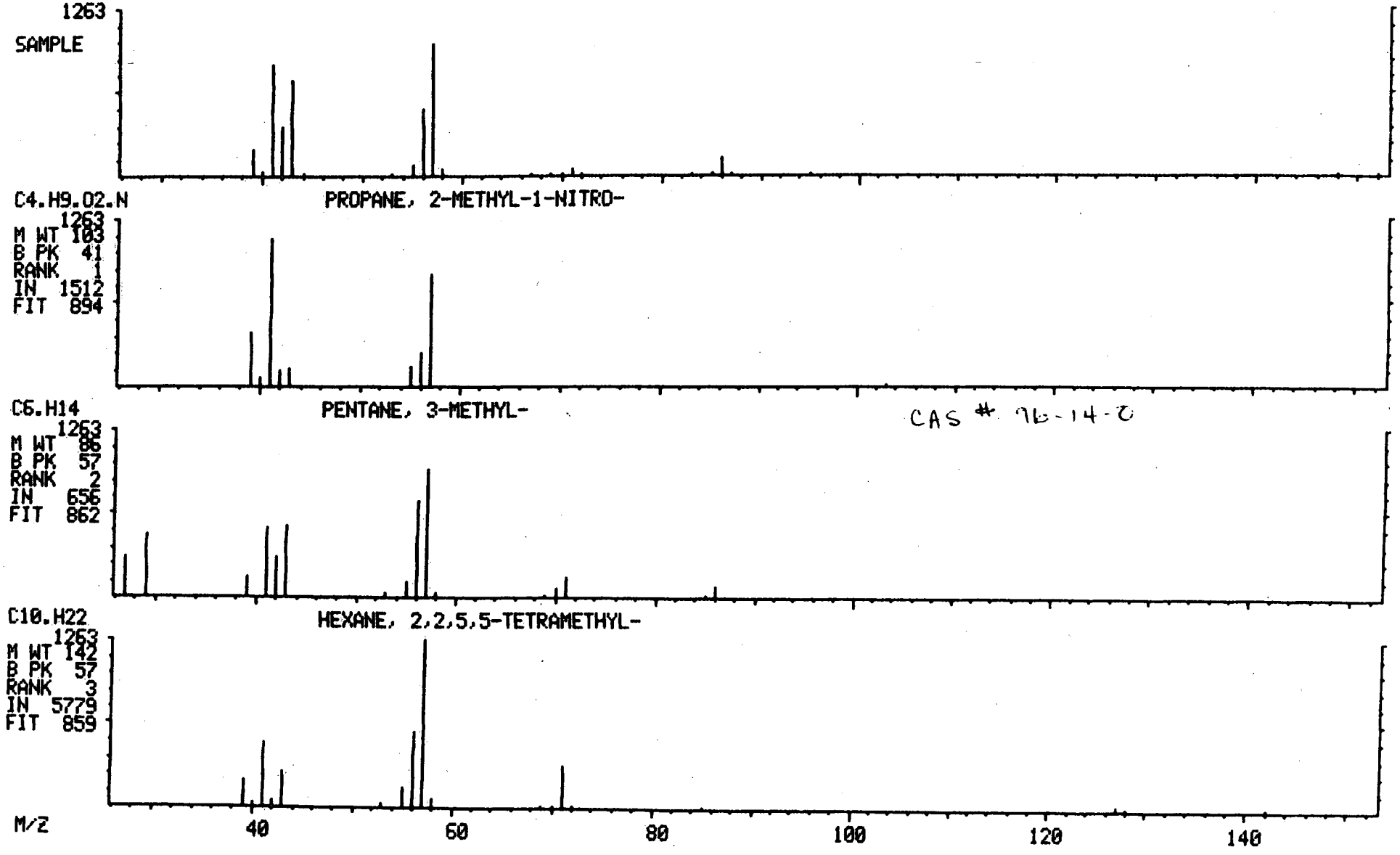



51

MID LIBRARY SEARCH
08/20/87 10:55:00 + 21:34
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 # 647
CALI: VOA5808 # 2

BASE M/Z: 57
RIC: 239359.



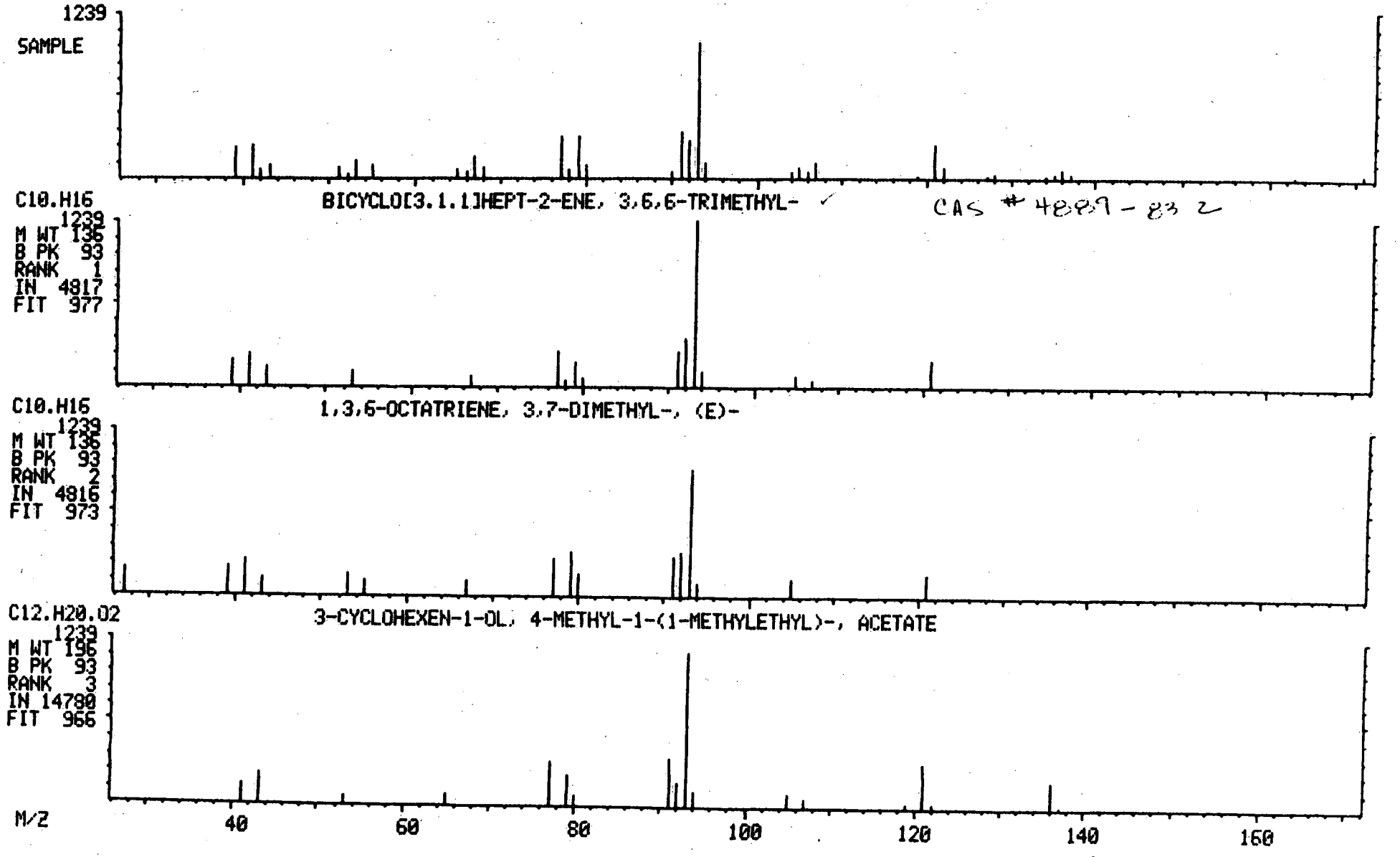

CAS # 96-14-0

52

MID LIBRARY SEARCH
08/20/87 10:55:00 + 29:14
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 # 877
CALI: VOA5808 # 2

BASE M/Z: 93
RIC: 7479.

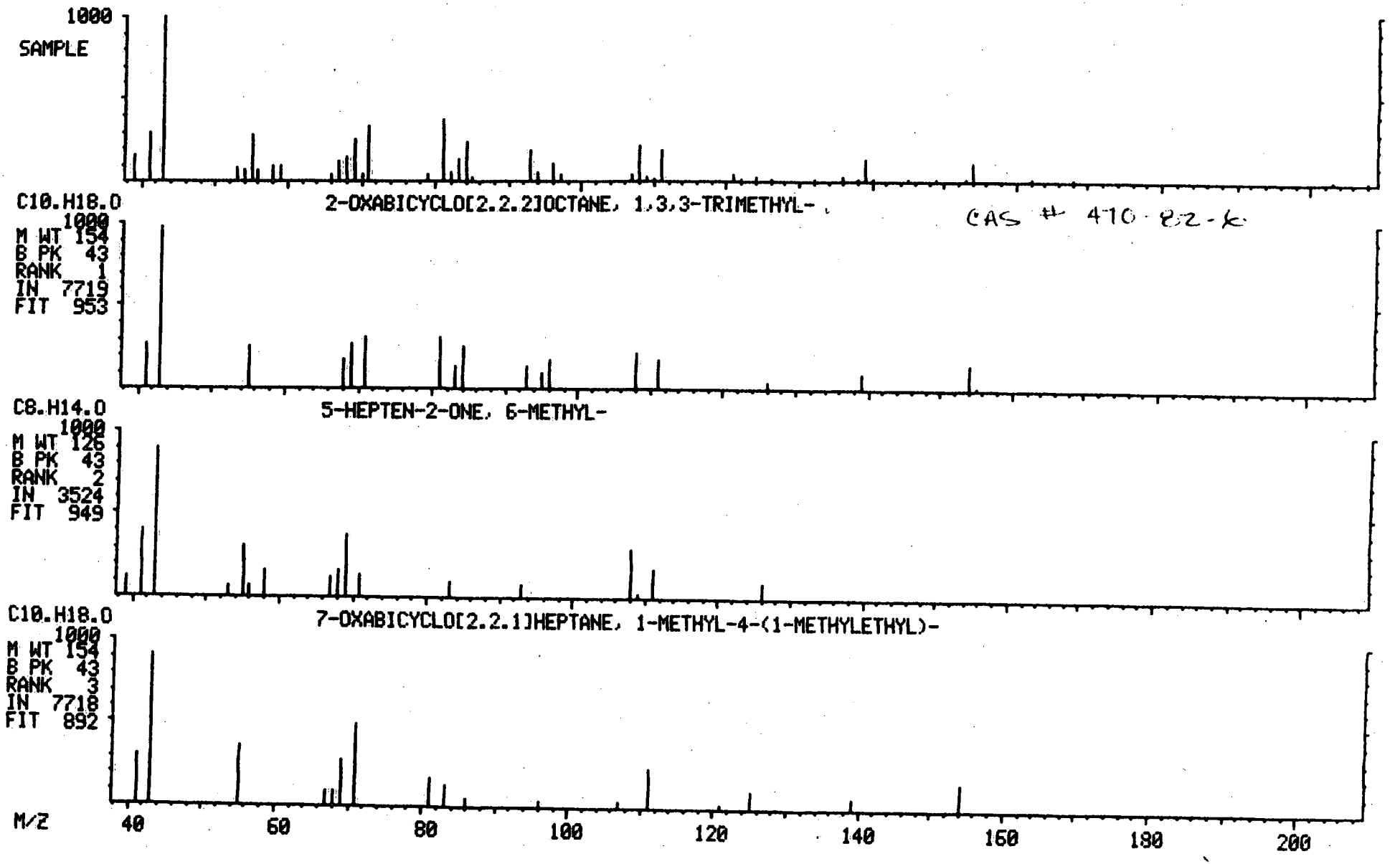



53

MID LIBRARY SEARCH
08/20/87 10:55:00 + 31:48
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (5 15B 2N 0T)

DATA: VOA5808 # 954
CALI: VOA5808 # 2

BASE M/Z: 43
RIC: 17247.

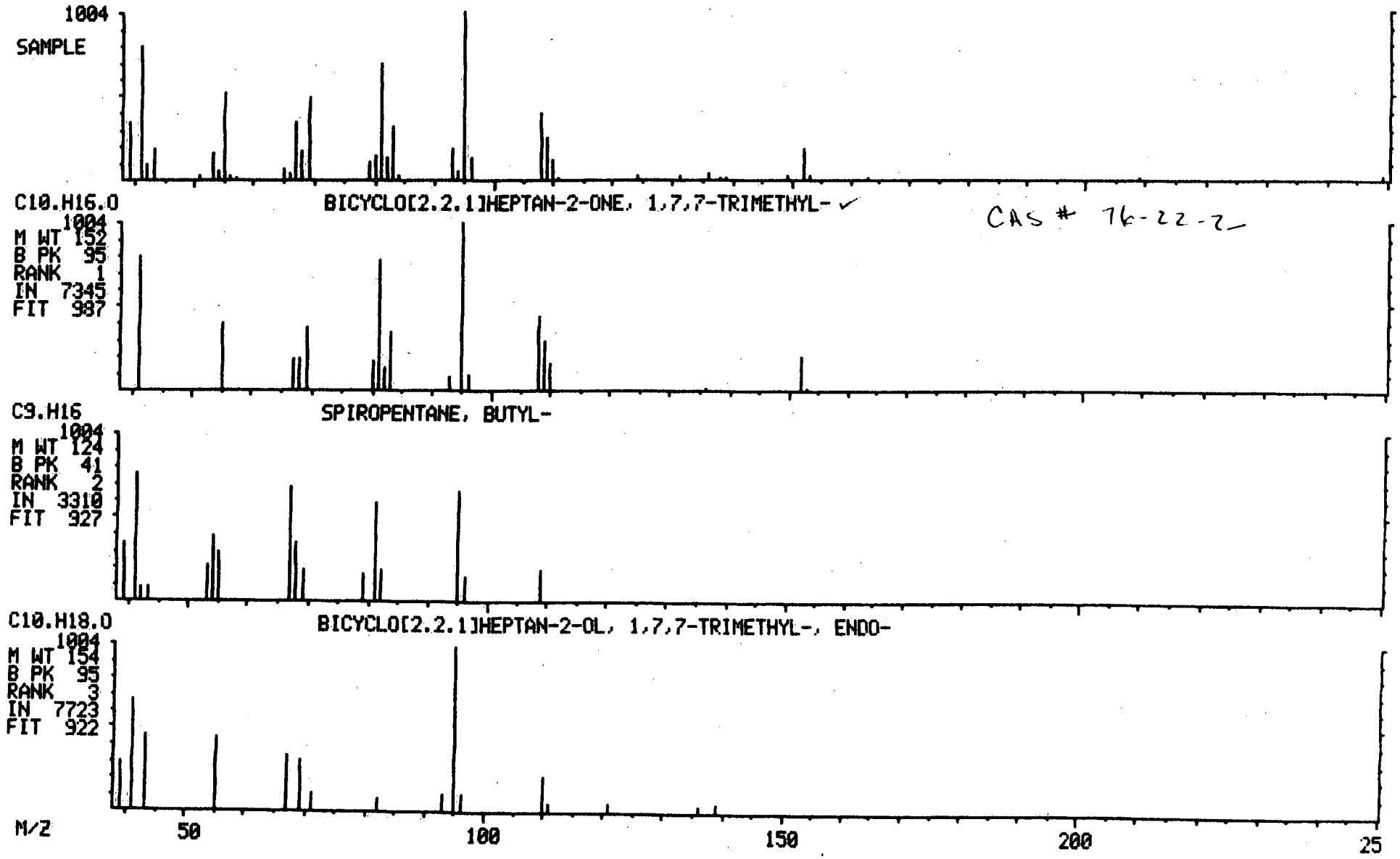



54

MID LIBRARY SEARCH
08/20/87 10:55:00 + 34:20
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 #1030
CALI: VOA5808 # 2

BASE M/Z: 95
RIC: 15791.



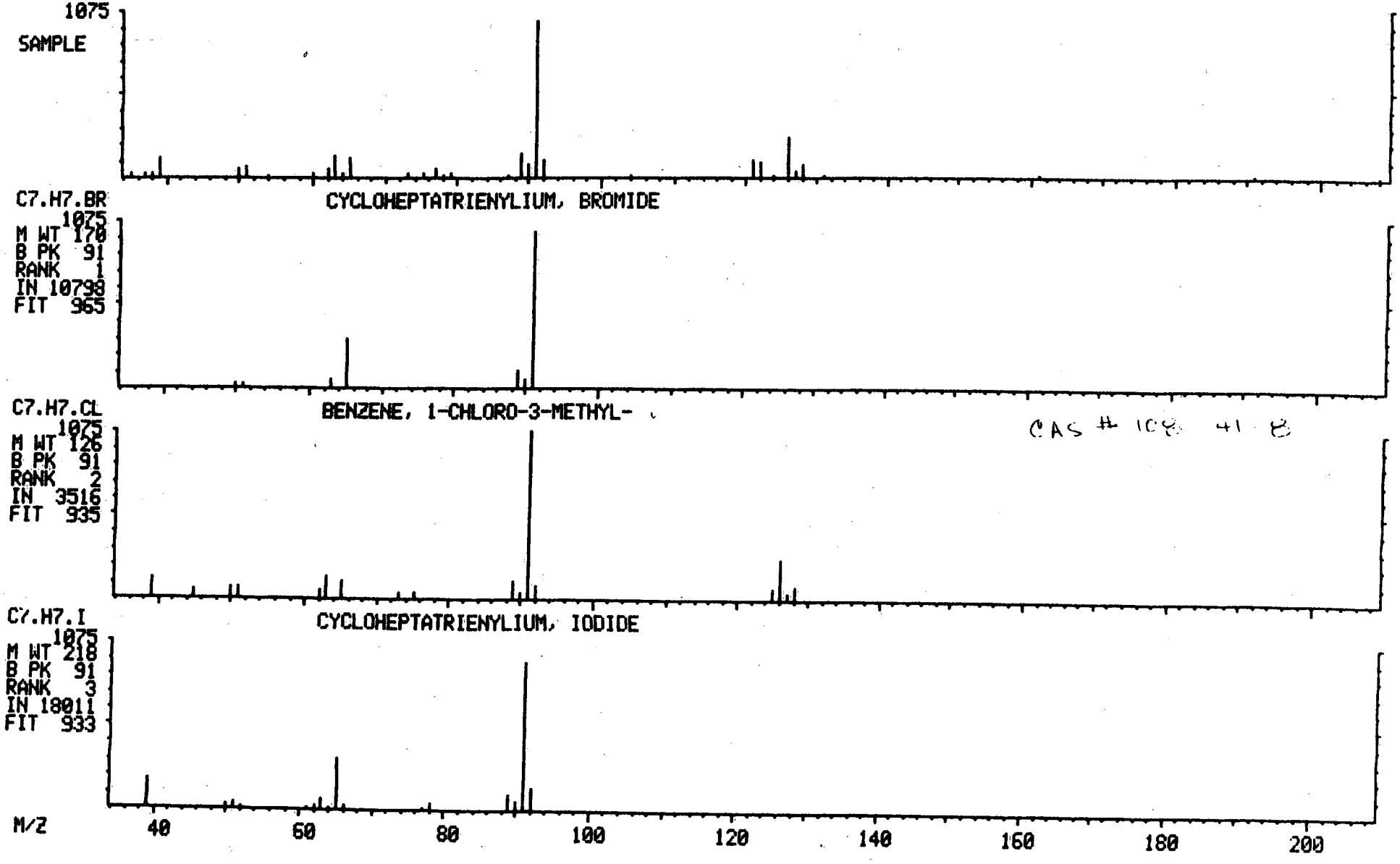

CAS # 76-22-2

55

MID LIBRARY SEARCH
08/20/87 10:55:00 + 36:32
SAMPLE: GC/MS#1, 2033-6008 ( 1/10 DILUTION )
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5808 #1096
CALI: VOA5808 # 2

BASE M/Z: 91
RIC: 11247.




CAS # 108 41 8

56

# REAGENT BLANK SUMMARY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

| FILE ID | DATE OF ANALYSIS | FRACTION | MATRIX | CONC. LEVEL | INST. ID | CAS NUMBER | COMPOUND (HSL, TIC OR UNKNOWN) | CONC. | UNITS | CRQL |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA 5810 | 8/20/87 | VOA | WATER | Low | 5700 | N/A | Methylene Chloride | 4J | ug/L | 5 |

Comments:

LS

FORM IV

4/84

# CHAIN OF CUSTODY RECORD

Log Book Pg. No. 10/11

Project Name/Number ORBIS P87-304 | Sample Date: 8-7-87

— See options below

| ETK Lab # Sample # | Sub | Field Sample No. A | B | Time | Sample Location | Sample Depth | Sample Type | No. of Containers | Section / Option: Metals A B C D | GC/MS Organics A B C D | Other Organics A B C D | Nutrients A B C D | S.D.W.A. | Solids | Bacty | TC/FC | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | P304 | 6007 | 11:20 | OB-4 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | ALL SAMPLES |
| | | P304 | 6008 | 11:35 | OB-7 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | OBTAINED FROM |
| | | P304 | 6009 | 11:50 | OB-8 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | TEST PITS IN |
| | | P304 | 6010 | 12:00 | OB-5 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | U.G. STORAGE |
| | | | | | | | | | | | | | | | | | TANK (REMOVED) AREA |

| Metals -M- | GC/MS Organics -G- | Organics (Other) -Q- | Nutrients - Minerals -N- | S.D.W.A. Conven. Analysis -S- | Solid Series / pH Conductivity |
|---|---|---|---|---|---|
| "A" Priority Metals<br>As Sb Be Cd<br>Cr Cu Pb Hg<br>Ni Se Ag Tl<br>Zn | "A" P.P. + 40<br>VOAs + 15<br>A/BNs + 25<br>Pesticides & PCBs | "A" PHC<br>Petroleum Hydrocarbons | "A" Nutrients<br>Ammonia<br>Nitrate<br>Nitrite<br>Total Phosphorus<br>TKN | Primary:<br>$Fl^-$ Turb. $NO_3$-N<br>Secondary:<br>pH TDS Alk.<br>Hardness L.I. $SO_4$<br>$Cl^-$ $F^-$ M.B.A.S. | TS TDS<br>TSS TVDS<br>pH TVSS<br>Conductivity |
| "B" S.D.W.A.<br>Primary:<br>As Ba Cd Cr<br>Pb Na Hg Se Ag<br>Secondary:<br>Cu Fe Mn Zn | "B" P.P. — No Searches<br>VOAs<br>A/BNs<br>Pesticides & PCBs | "B" O & G<br>Oil & Grease | "B" Minerals<br>Alk. $Cl^-$<br>pH $F^-$<br>Hard. $SO_4$<br>L.I. Turb. | | |
| "C" Misc. Metals<br>Cr+6 Fe Mn<br>Na Ba K<br>Ca Mg | "C" VOAs only<br>A. Searches<br>B. No Searches<br>C. Specific: _____ | "C" Total Phenols<br>Total Phenols | "C" Oxygen Demand<br>B.O.D. C.O.D.<br>A. Total<br>B. Soluable | | |
| "D" List (others) | "D" A-280<br>A-280 Parameters<br>S.D.W.A. | "D" Cyanide<br>Cyanide | "D" Misc. List | | |

| Bottles/Samplers Prepared by: | Date | Time |
|---|---|---|
| KJA | 8/6/87 | 1000 |
| **Sampled by:** | **Date** | **Time** |
| KE Kaul | 8/7/87 | see Above |
| **Received by:** | **Date** | **Time** |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| **Lab. Received by:** | **Date** | **Time** |
| [signature] | 8/7/87 | 1315 |

2033

2 of 3

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**Elson T. Killam Associates, Inc.**

27 Bleeker Street, P.O. Box 1008, Millburn, NJ 07041
Tel. 201/379-3400 Telex 642-057 Telecopier 201/376-1072

Environmental and Hydraulic Engineers

# ANALYTICAL DATA REPORT

**ORBIS PRODUCTS CORP.**

**NEWARK, NEW JERSEY**

**U.G. STORAGE TANK AREA**

**PROJECT NUMBER:** P87-304

**LABORATORY REFERENCE NUMBER:** 2033-6009

**DATE AND TIME COLLECTED:** 8/7/87 11:50

Nancy J. Potak
LABORATORY DIRECTOR

SEPTEMBER 24, 1987

N.J. LABORATORY
CERTIFICATION NO.: 07059

Elson T. Killam Associates, Inc.

# LABORATORY CHRONICLE

**LABORATORY SAMPLE NO.:** 2033-6009

**RECEIVED:** 8/7/87

**ORGANICS:**

**EXTRACTION:**

**ANALYSES:**

1. **VOLATILE COMPOUNDS:** 8/20/87
2. **ACID EXTRACTABLES:**
3. **BASE/NEUTRALS:**
4. **PESTICIDES/PCBs:**

**METALS:**

**DIGESTION:**

**ANALYSES:**

| OTHER ANALYSES: | EXTRACTED: | ANALYSES: |
|---|---|---|
| PHC | 8/13/87 | 8/14/87 |

**QUALITY CONTROL SUPERVISOR REVIEW AND APPROVAL:** [illegible]

# METHODOLOGY SUMMARY

**Purgeable Organics**

USEPA METHOD 624

**Acid Extractables**

**Base/Neutral Extractables**

**PESTICIDE EXTRACTABLES**

**Metals**

**Total Cyanide**

**Total Phenol**

**Other** PHC - USEPA METHOD 418.1 (Modified for soil)

# PETROLEUM HYDROCARBONS DATA

LABORATORY SAMPLE NO.: 2033-6009

| | CONCENTRATION DRY WEIGHT (mg/Kg) | DETECTION LIMIT (mg/Kg) |
|---|---|---|
| PETROLEUM HYDROCARBONS | 3,530 | 132 |

BDL = BELOW DETECTION LIMIT

## PETROLEUM HYDROCARBONS
## MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

**LAB REFERENCE ID NO.:** 2033-6009 **QUALITY ASSURANCE SAMPLE:** 2033-6006

| LAB SAMPLE NO. | CONC. SPIKE ADDED | SAMPLE CONC. | CONC. MS | % REC | CONC. MSD | % REC | RPD |
|---|---|---|---|---|---|---|---|
| 2033-6006..... | 610 | <30 | 612 | 100 | 632 | 104 | 4 |

Concentration - mg/kg
RPD - relative percent difference

## DATA QUALIFIERS

The following four qualifiers are used in the analytical report package. They are equivalent to those issued by EPA - Contract Laboratory Program:

U - Indicates that the compound was analyzed for but not detected. All sample detection limits reported have been corrected for dilution and per cent moisture. No adjustements for blank contamination have been made.

J - Refers to an estimated value. This is used when the mass spectral data indicates the presence of a compound that meets the identification criteria, yet has a concentration less than the contract required detection limit. All estimated values reported have been adjusted for both dilution and per cent moisture, but no corrections have been made for possible blank contamination.

B - This flag is used to note that the compound was found to be present in the laboratory blank as well as in the sample. It indicates that the possibility of laboratory contamination exists.

The EPA has issued certain quidelines to aid in the evaluation of data when common laboratory artifacts occur. Blank contribution is considered to be negligable if it is ten times less than the concentration present in the sample. If the concentrations of the compounds found in both the sample and the blank are comparable (i.e. sample concentration is less than twice that of the blank), the occurance of the compound in the sample is considered to be suspect.

Up to 25 ppb of methylene chloride is permitted to be present in the blanks of volatile organic analyses.

C - Applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ul in the final extract are confirmed by GC/MS.

The next qualifier is also used in referencing the analytical results:

X - This flag indicates the presence of a compound which is often found as a common laboratory or field contaminant.

# VOLATILE COMPOUNDS DATA

LABORATORY SAMPLE NO.: 2033-6009( 1/10 DIL ) DATA FILE NO.: VOA5806

% SOLIDS: 75.6

| | CONCENTRATION (ug/Kg) | | SCAN | DETECTION LIMIT (ug/Kg) |
|---|---|---|---|---|
| ACROLEIN | | U | | 1300. |
| ACRYLONITRILE | | U | | 1300. |
| BENZENE | 9800 | | 605 | 66. |
| BROMOFORM | | U | | 66. |
| BROMOMETHANE | | U | | 130. |
| CARBON TETRACHLORIDE | | U | | 66. |
| CHLOROBENZENE | | U | | 66. |
| DIBROMOCHLOROMETHANE | | U | | 66. |
| CHLOROETHANE | | U | | 130. |
| 2-CHLORO ETHYL VINYL ETHER | | U | | 130. |
| CHLOROFORM | | U | | 66. |
| CHLOROMETHANE | | U | | 66. |
| BROMODICHLOROMETHANE | | U | | 66. |
| 1,1-DICHLOROETHANE | | U | | 66. |
| 1,2-DICHLOROETHANE | | U | | 66. |
| 1,1-DICHLOROETHENE | | U | | 66. |
| TRANS-1,2-DICHLOROETHENE | | U | | 66. |
| 1,2-DICHLOROPROPANE | | U | | 66. |
| CIS-1,3-DICHLOROPROPENE | | U | | 66. |
| TRANS-1,3-DICHLOROPROPENE | | U | | 66. |
| ETHYLBENZENE | 1200 | | 893 | 66. |
| METHYLENE CHLORIDE | 68 | JB | 282 | 66. |
| 1,1,2,2-TETRACHLOROETHANE | | U | | 66. |
| TETRACHLOROETHENE | | U | | 66. |
| TOLUENE | 4900 | | 798 | 66. |
| 1,1,1-TRICHLOROETHANE | | U | | 66. |
| 1,1,2-TRICHLOROETHANE | | U | | 66. |
| TRICHLOROETHENE | | U | | 66. |
| VINYL CHLORIDE | | U | | 130. |
| ACETONE - HSL | 1900 | | 298 | 130. |
| CARBON DISULFIDE - HSL | | U | | 66. |
| 2-HEXANONE - HSL | 310 | | 747 | 130. |
| 2-BUTANONE | | U | | 130. |
| 4-METHYL-2-PENTANONE -HSL | | U | | 130. |
| STYRENE - HSL | | U | | 66. |
| TOTAL XYLENES - HSL | 2600 | | 1018,1050 | 66. |

Laboratory Name E.T. Killam Assoc.

Case No

| Sample Number |
|---|
| 2033-6009 |

## Organics Analysis Data Sheet
(Page 4)

### Tentatively Identified Compounds

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. | UNKNOWN | VOA | 337 | 140 |
| 2. 110-8-7 | CYCLOHEXANE < DOT | VOA | 516 | 3,000 |
| 3. 96-37-7 | CYCLOPENTANE METHYL | VOA | 535 | 3,600 |
| 4. 79-29-8 | BUTANE, 2,3-DIMETHYL | VOA | 569 | 360 |
| 5. | UNKNOWN | VOA | 591 | 6,200 |
| 6. 96-14-0 | PENTANE, 3-METHYL | VOA | 645 | 6,700 |
| 7. 108-08-7 | PENTANE, 2,4-DIMETHYL | VOA | 691 | 200 |
| 8. 488-97-1 | TRICYCLO[2.2.1.02,6] HEPTANE, | VOA | 877 | 140 |
| 9. | 1,3,3-TRIMETHYL | | | |
| 10. 100-66-3 | BENZENE METHOXY | VOA | 932 | 120 |
| 11. 470-82-6 | 2-OXABICYCLO[2.2.2]OCTANE, | | | |
| 12. | 1,3,3 TRIMETHYL | VOA | 955 | 840 |
| 13. 108-41-8 | BENZENE, 1-CHLORO-3-METHYL | VOA | 1098 | 992 |
| 14. | | | | |
| 15. | | | | |
| 16. | | | | |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. | | | | |
| 21. | | | | |
| 22. | | | | |
| 23. | | | | |
| 24. | | | | |
| 25. | | | | |
| 26. | | | | |
| 27. | | | | |
| 28. | | | | |
| 29. | | | | |
| 30. | | | | |

# METHOD PERFORMANCE DATA

## SOILS SURROGATE PERCENT RECOVERY

LABORATORY SAMPLE NO.: 2033-6009

| COMPOUND | RECOVERY | EPA CONTROL LIMITS | SCAN # |
|---|---|---|---|
| **VOLATILE FRACTION** | | | |
| TOLUENE - D8 | 8* | 81-117 | 761 |
| BROMOFLUOROBENZENE | 102 | 74-121 | 971 |
| 1,2-DICHLOROETHANE | 100 | 70-121 | 458 |
| **SEMI-VOLATILE FRACTION** | | | |
| NITROBENZENE-D5 | - | 23-120 | - |
| 2-FLUOROBIPHENYL | - | 30-116 | - |
| TERPHENYL-D14 | - | 18-137 | - |
| PHENOL-D5 | - | 24-113 | - |
| 2-FLUOROPHENOL | - | 26-121 | - |
| 2,4,6-TRIBROMOPHENOL | - | 19-122 | - |
| **PESTICIDE** | | | |
| DIBUTYL CHLORENDATE | - | 20-150** | - |

*LOW SURROGATE RECOVERY DUE TO MATRIX EFFECT OF HIGH CONCENTRATION OF TOLUENE IN THE SAMPLE.
**ADVISORY LIMITS ONLY

# INTERNAL STANDARD SCAN LIST
## (RETENTION TIME)

LABORATORY SAMPLE NO.: 2033-6009

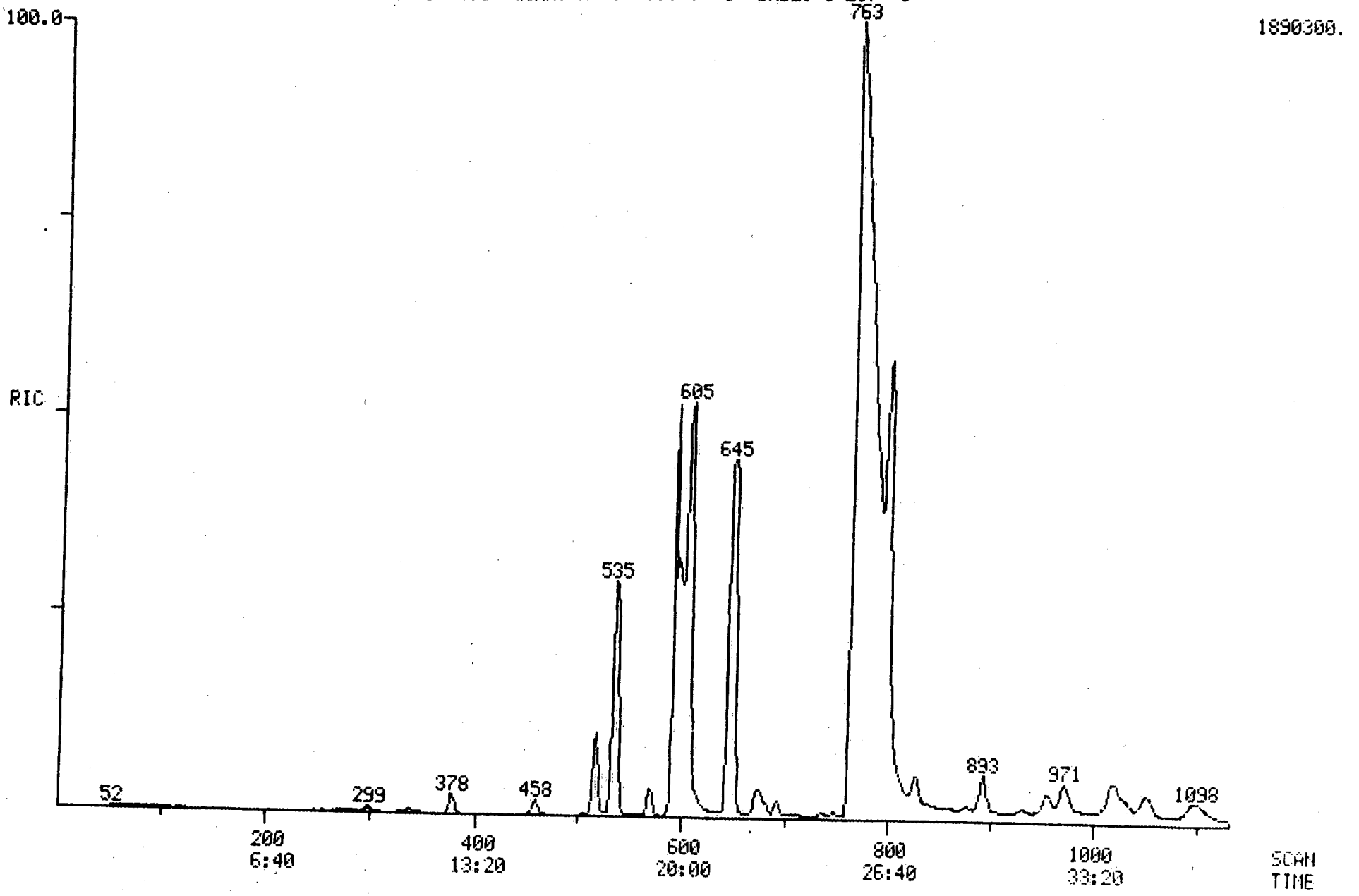
| INTERNAL STANDARD | SCAN # |
|---|---|
| **VOLATILE FRACTION** | |
| BROMOCHLOROMETHANE | 378 |
| 1,4-DIFLUOROBENZENE | 675 |
| CHLOROBENZENE-D5 | 827 |

| SEMI-VOLATILE FRACTION | SCAN # |
|---|---|
| 1,4-DICHLOROBENZENE-D4 | - |
| NAPTHALENE-D8 | - |
| ACENAPTHENE-D10 | - |
| PHENANTHRENE-D10 | - |
| CHRYSENE-D12 | - |
| PERYLENE-D12 | - |

MIDRIC
08/20/87 9:20:00
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
RANGE: G 1,1130 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: VOA5806 #1
CALI: VOA5806 #2

SCANS 1 TO 1130



# SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Low Level X Medium Level _____

| FRACTION | COMPOUND | CONC. SPIKE ADDED (ug/Kg) | SAMPLE RESULT | CONC. MS | % REC | CONC. MSD | % REC | RPD | QC LIMITS* RPD | QC LIMITS* RECOVERY |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA SMO SAMPLE NO. 2033 6004 | 1,1-Dichloroethene | 50 | 0 | 38 | 76 | 47 | 94 | 10 | 22 | 59-172 |
| | Trichloroethene | 50 | 0 | 40 | 80 | 46 | 92 | 7 | 24 | 62-137 |
| | Chlorobenzene | 50 | 0 | 46 | 92 | 53 | 106 | 7 | 21 | 60-133 |
| | Toluene | 50 | 7 | 43 | 86 | 54 | 108 | 11 | 21 | 59-139 |
| | Benzene | 50 | 3 | 47 | 94 | 53 | 106 | 6 | 21 | 66-142 |
| B/N SMO SAMPLE NO. | 1,2,4-Trichlorobenzene | | | | | | | | 23 | 38-107 |
| | Acenaphthene | | | | | | | | 19 | 31-137 |
| | 2,4 Dinitrotoluene | | | | | | | | 47 | 28-89 |
| | Di-n-Butylphthalate | | | | | | | | 47 | 29-135 |
| | Pyrene | | | | | | | | 36 | 35-142 |
| | N-Nitrosodi-n-Propylamine | | | | | | | | 38 | 41-126 |
| | 1,4-Dichlorobenzene | | | | | | | | 27 | 28-104 |
| ACID SMO SAMPLE NO. | Pentachlorophenol | | | | | | | | 47 | 17-109 |
| | Phenol | | | | | | | | 35 | 26-90 |
| | 2-Chlorophenol | | | | | | | | 50 | 25-102 |
| | 4-Chloro-3-Methylphenol | | | | | | | | 33 | 26-103 |
| | 4-Nitrophenol | | | | | | | | 50 | 11-114 |
| PEST SMO SAMPLE NO. | Lindane | | | | | | | | 50 | 46-127 |
| | Heptachlor | | | | | | | | 31 | 35-130 |
| | Aldrin | | | | | | | | 43 | 34-132 |
| | Dieldrin | | | | | | | | 38 | 31-134 |
| | Endrin | | | | | | | | 45 | 42-139 |
| | 4,4'-DDT | | | | | | | | 50 | 23-134 |

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 0 out of 5 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

RECOVERY: VOAs 0 out of 10 : outside QC limits
B/N _____ out of _____ : outside QC limits
ACID _____ out of _____ : outside QC limits
PEST _____ out of _____ : outside QC limits

Comments: _____

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# GC/MS TUNING AND MASS CALIBRATION

## Bromofluorobenzene (BFB)

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Instrument ID 5100 Date 8/20/87 Time 5:21 + 32:20

Lab ID VOA 5801 Data Release Authorized By: JEF

| m/e | ION ABUNDANCE CRITERIA | %RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of the base peak | 18.11 |
| 75 | 30.0 - 60.0% of the base peak | 40.94 |
| 95 | Base peak, 100% relative abundance | 100.00 |
| 96 | 5.0 - 9.0% of the base peak | 5.76 |
| 173 | Less than 1.0% of the base peak | <1 |
| 174 | Greater than 50.0% of the base peak | 72.58 |
| 175 | 5.0 - 9.0% of mass 174 | 5.20 (7.16)[1] |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 70.66 (97.4)[1] |
| 177 | 5.0 - 9.0% of mass 176 | 4.48 (6.34)[2] |

[1] Value in parenthesis is % mass 174.
[2] Value in parenthesis is % mass 176.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

| SAMPLE ID | LAB ID | DATE OF ANALYSIS | TIME OF ANALYSIS |
|---|---|---|---|
| 50 ug/L VOA HSL STD | VOA 5801 | 8/20/87 | 5:21 |
| 2033-6007 (1/10 Dil) | VOA 5802 | " | 6:09 |
| BLANK | VOA 5803 | " | 6:56 |
| 2033-6010 (1/10 Dil) | VOA 5804 | " | 7:44 |
| BLANK | VOA 5805 | " | 8:32 |
| 2033-6009 (1/10 Dil) | VOA 5806 | " | 9:20 |
| BLANK | VOA 5807 | " | 10:07 |
| 2033-6008 (1/10 Dil) | VOA 5808 | " | 10:55 |
| N/A | VOA 5809 | " | N/A |
| BLANK | VOA 5810 | " | 12:30 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



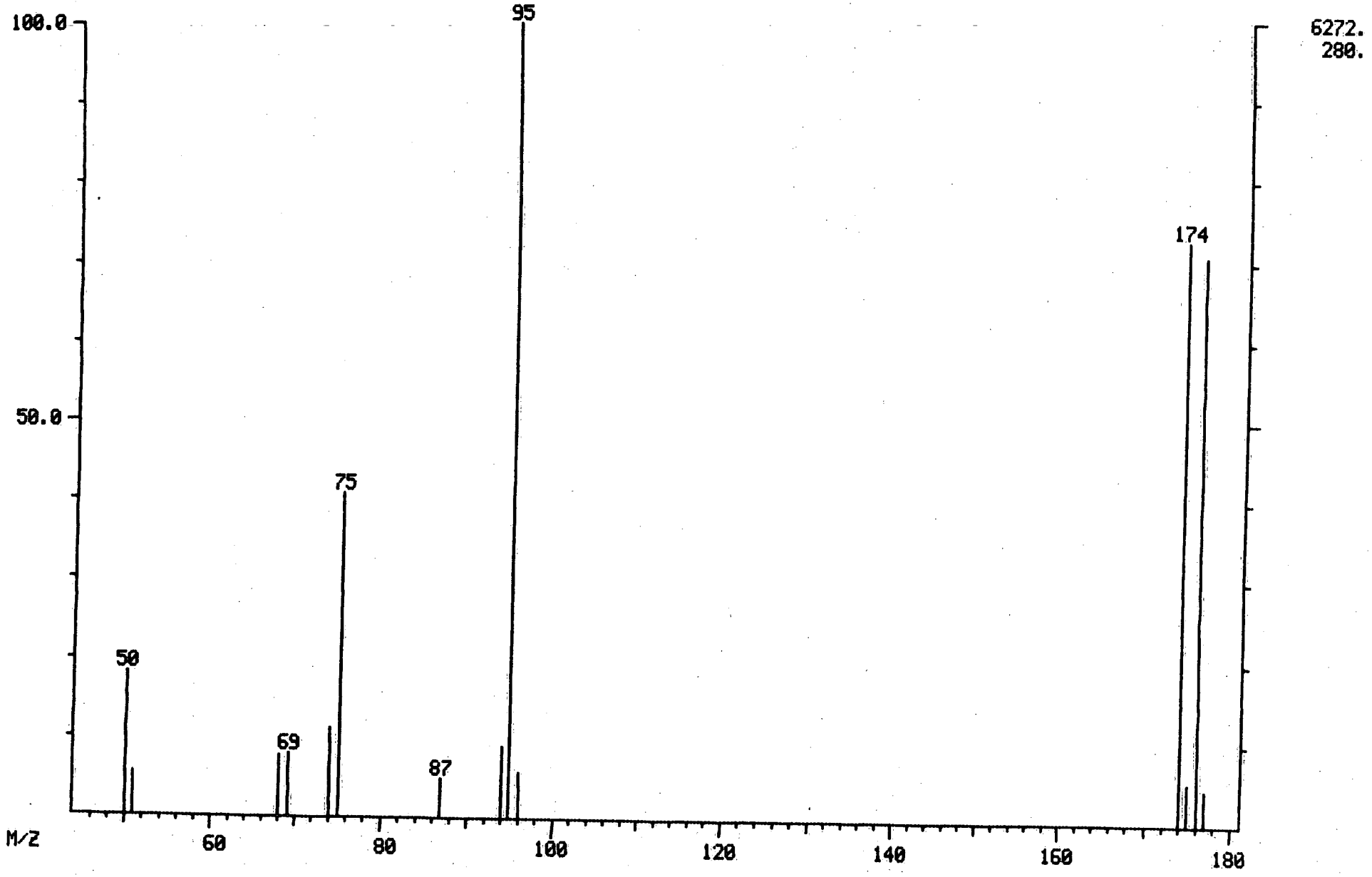
FORM V

4/84

MID MASS SPECTRUM
08/20/87 5:21:00 + 32:20
SAMPLE: GC/MS#1, @ 50 UG/L VOAHSL STD.
CONDS.: 624
GC TEMP: 239 DEG. C
ENHANCED (S 15B 2N 0T)

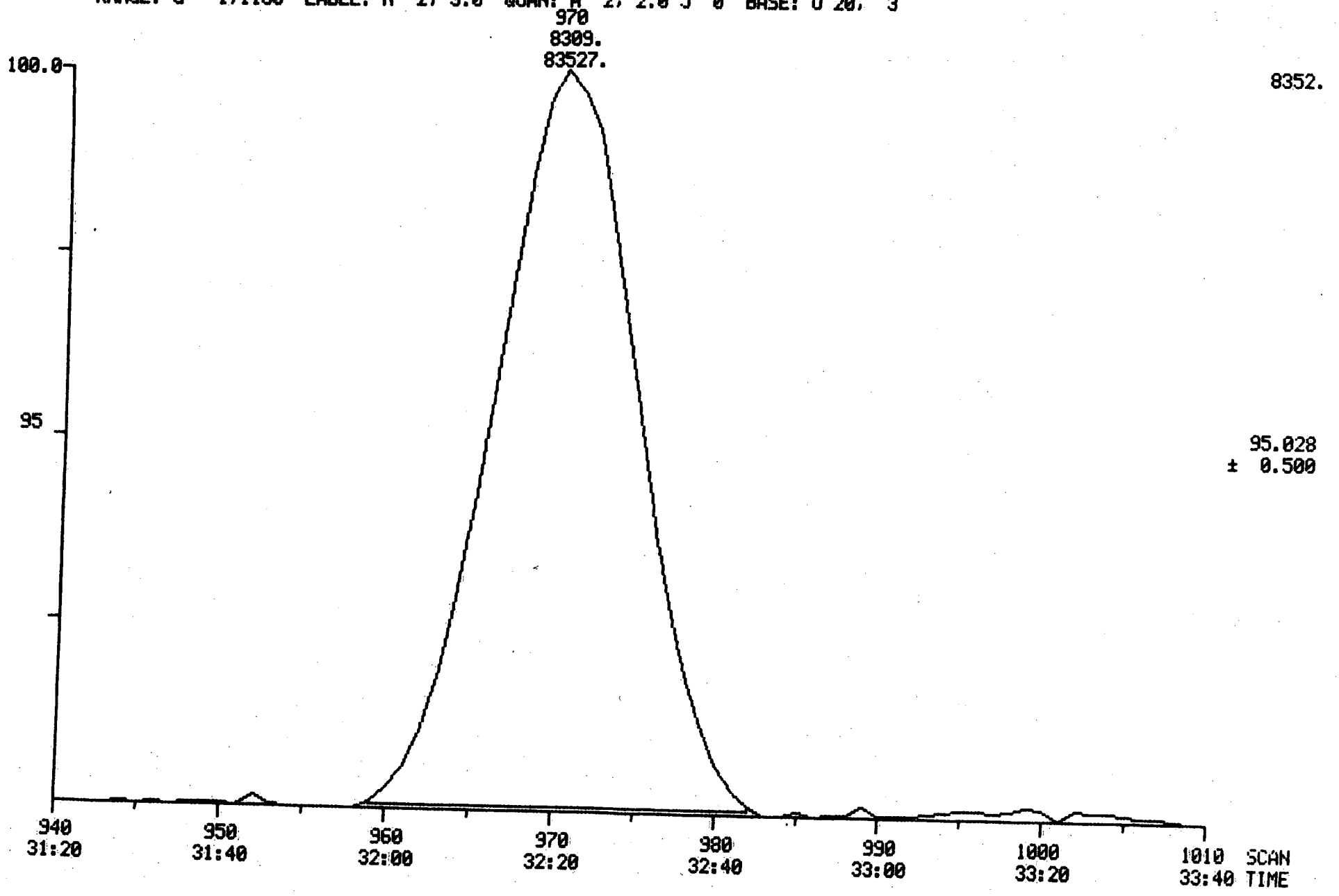
DATA: VOA5801 #970
CALI: VOA5801 #2

BASE M/Z: 95
RIC: 27424.




76

MIDMASS CHROMATOGRAM DATA: VOA5801 #970 SCANS 940 TO 1010
08/20/87 5:21:00 CALI: VOA5801 #2
SAMPLE: GC/MS#1, @ 50 UG/L VOAHSL STD.
CONDS.: 624
RANGE: G 1,1130 LABEL: N 2, 3.0 QUAN: A 2, 2.0 J 0 BASE: U 20, 3




73

# MASS SPECTRAL DATA

# FOR

# TENTATIVELY IDENTIFIED COMPOUNDS

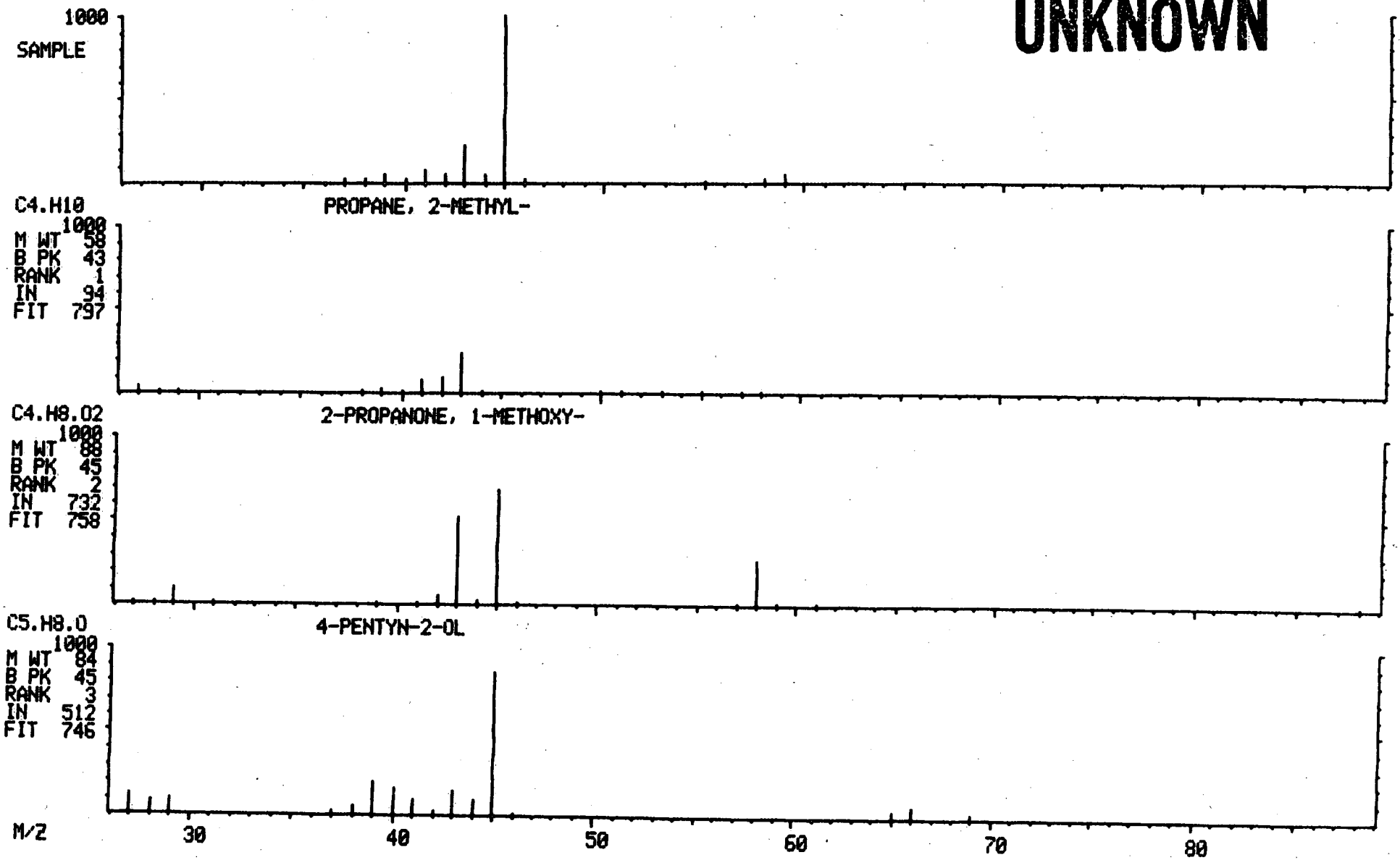
For each tentatively identified compound, a mass spectrum of the detected compound is provided with the mass spectrums of the three best matches from the NBS Library search. When the library search does not produce an adequate match, the detected compound is labelled as "unknown".

MID LIBRARY SEARCH
08/20/87 9:20:00 + 11:14
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 # 337
CALI: VOA5806 # 2

BASE M/Z: 45
RIC: 6871.

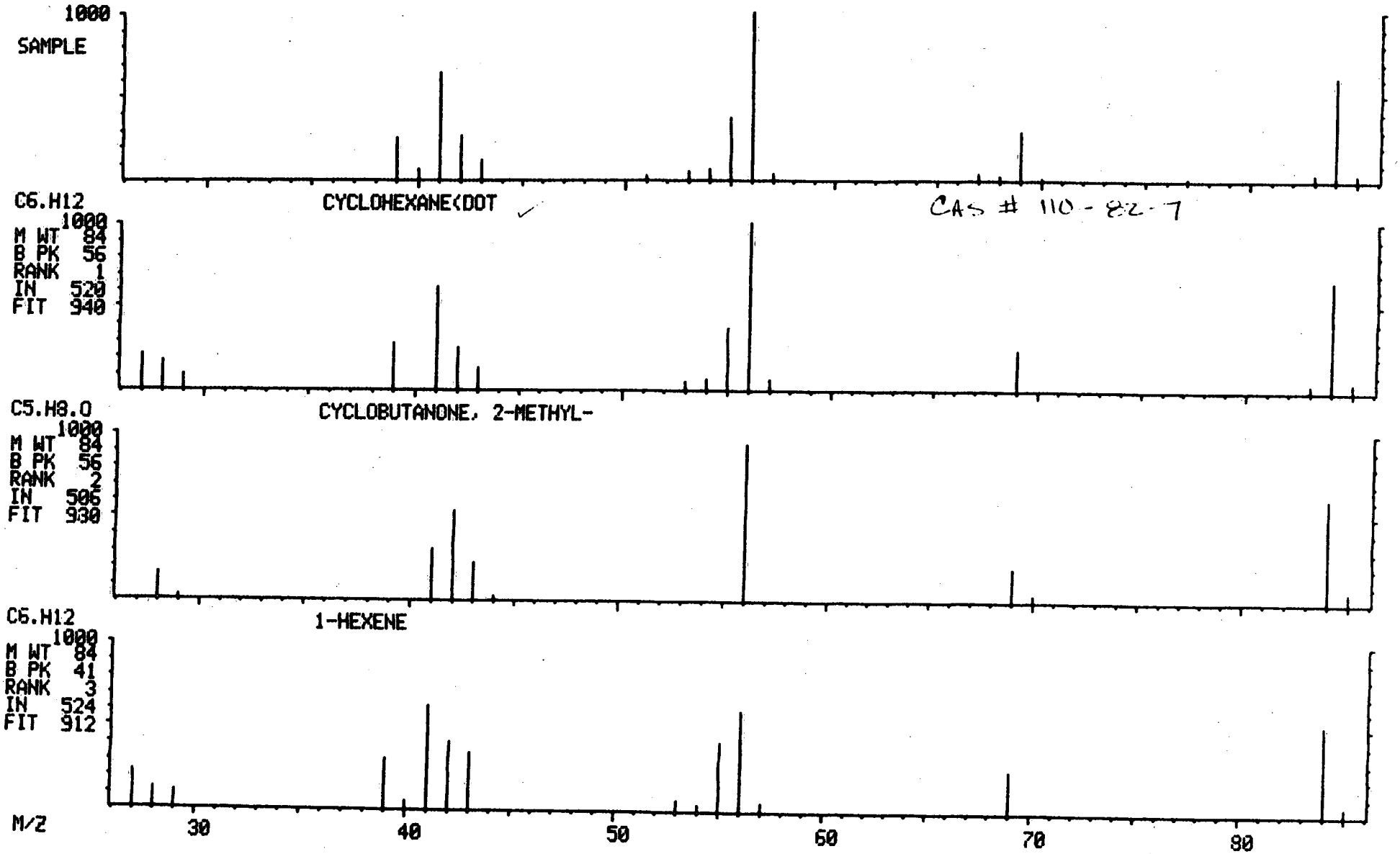
**UNKNOWN**



MID LIBRARY SEARCH
08/20/87 9:20:00 + 17:12
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (5 15B 2N 0T)

DATA: VOA5806 # 516
CALI: VOA5806 # 2

BASE M/Z: 56
RIC: 181247.

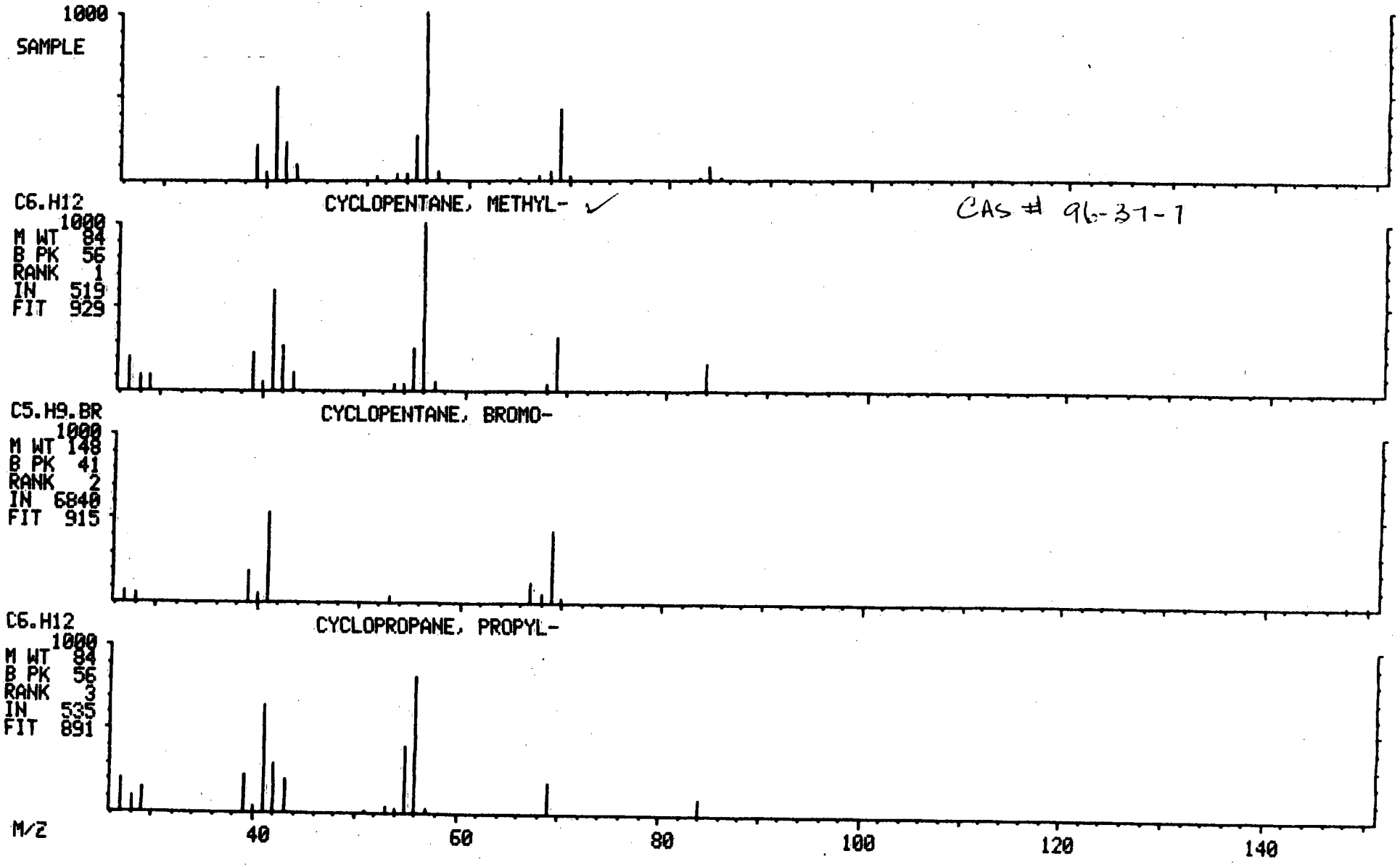



76

MID LIBRARY SEARCH
08/20/87 9:20:00 + 17:50
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 # 535
CALI: VOA5806 # 2

BASE M/Z: 56
RIC: 522239.

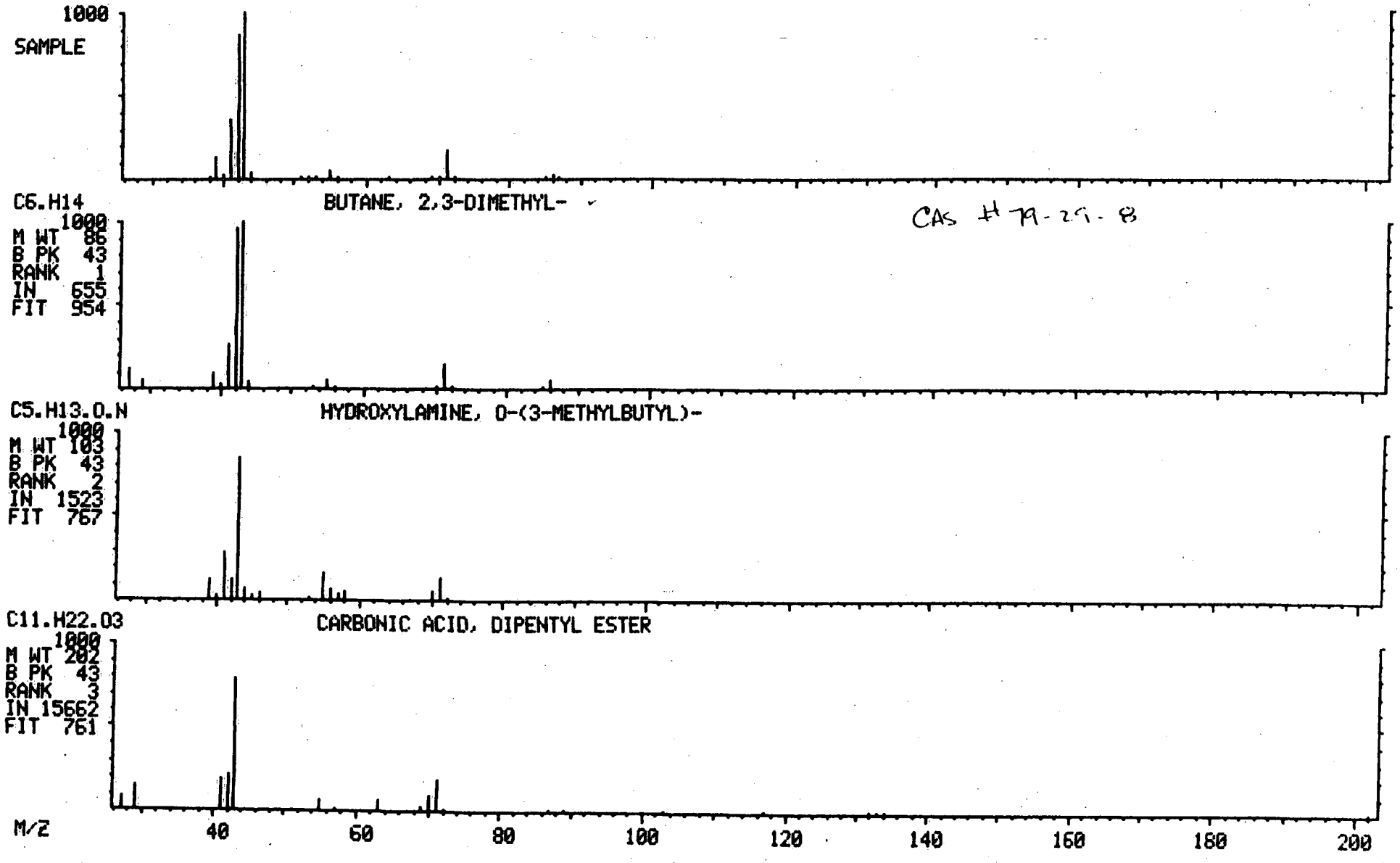



77

MID LIBRARY SEARCH
08/20/87 9:20:00 + 18:58
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (5 15B 2N 0T)

DATA: VOA5806 # 569
CALI: VOA5806 # 2

BASE M/Z: 43
RIC: 60415.



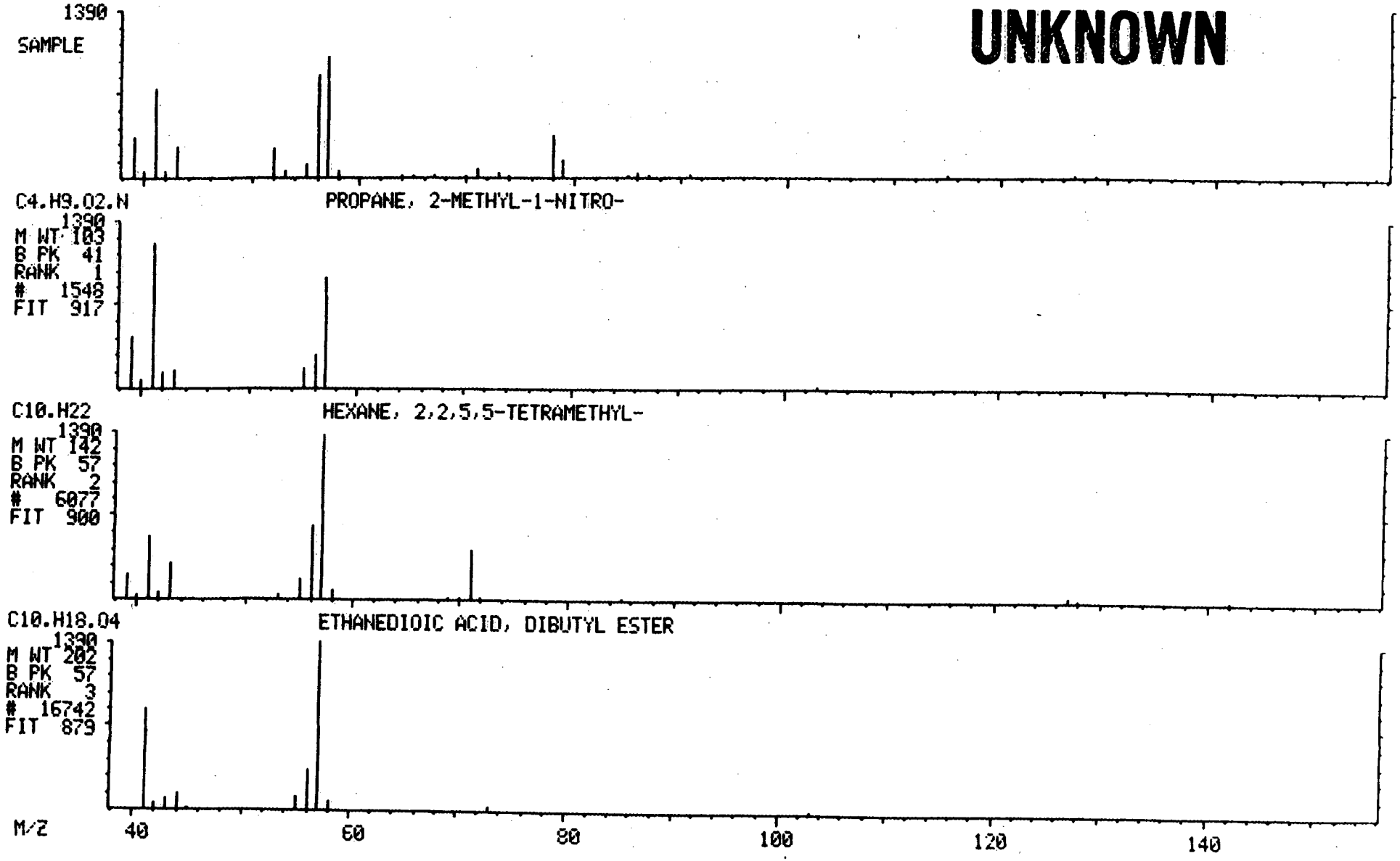

78

MID LIBRARY SEARCH
08/20/87 9:20:00 + 19:42
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 # 591
CALI: VOA5806 # 2

BASE M/Z: 57
RIC: 339967.

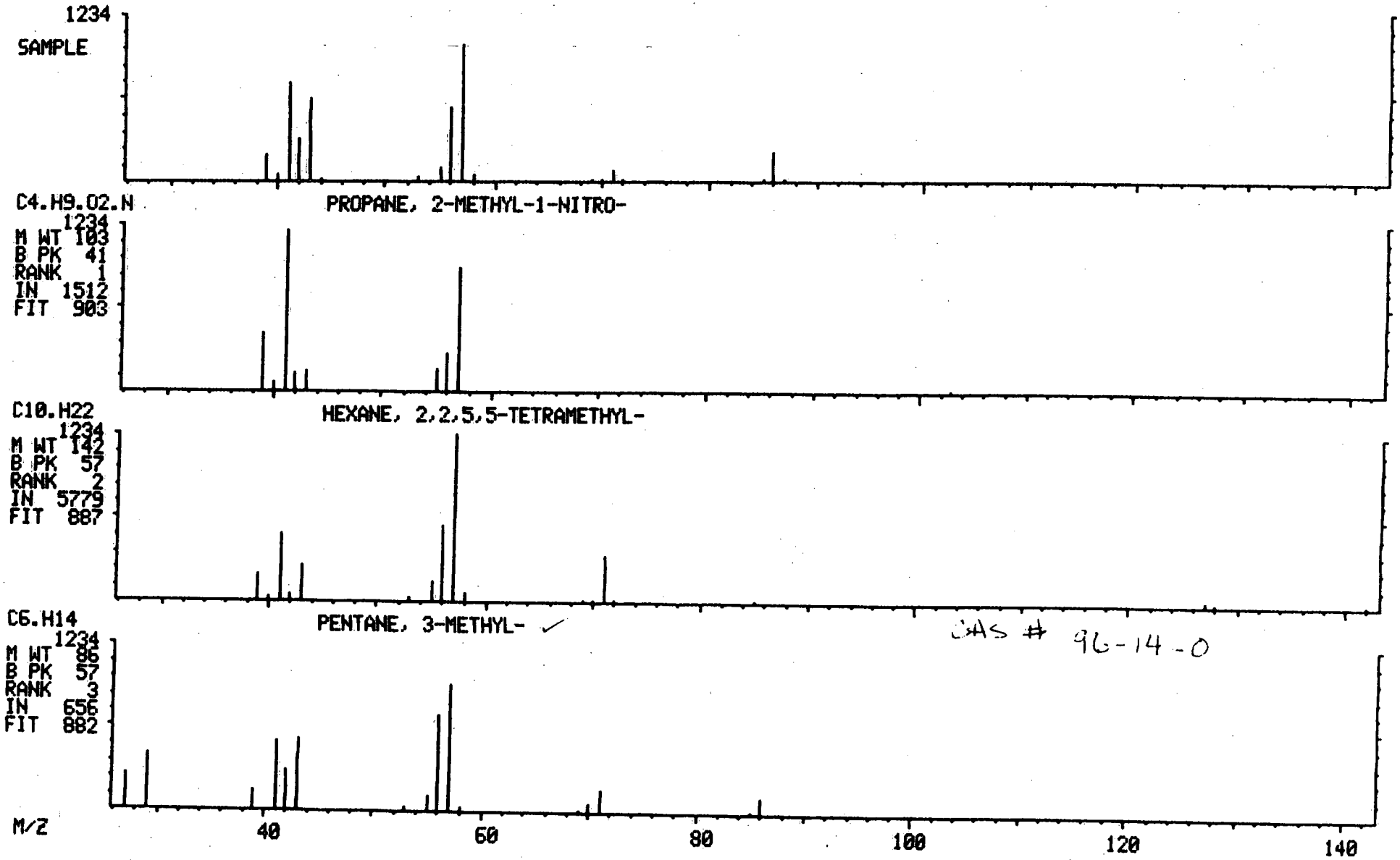
**UNKNOWN**



MID LIBRARY SEARCH
08/20/87 9:20:00 + 21:30
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 # 645
CALI: VOA5806 # 2

BASE M/Z: 57
RIC: 782335.

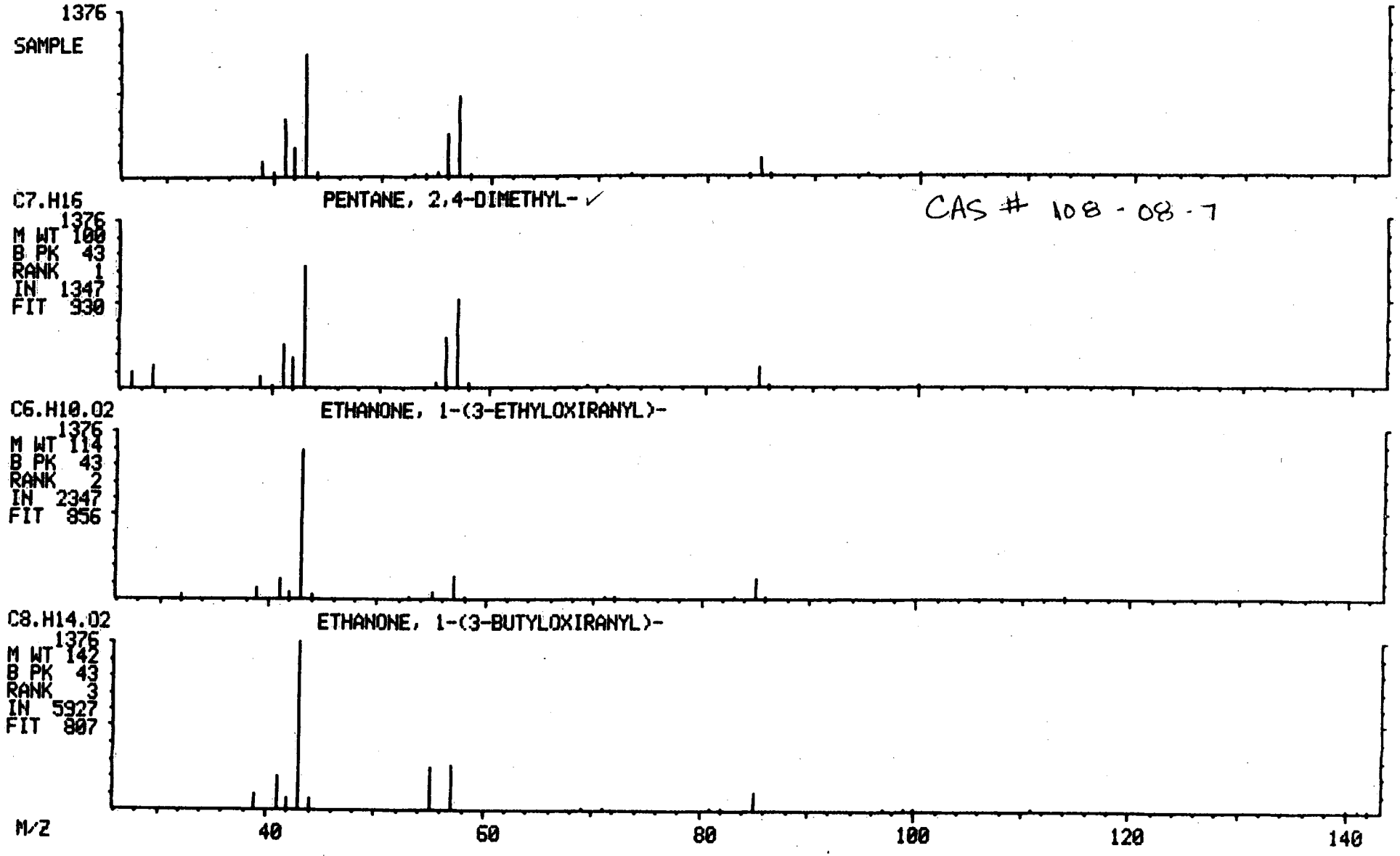



CAS # 96-14-0

MID LIBRARY SEARCH
08/20/87 9:20:00 + 23:02
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 # 691
CALI: VOA5806 # 2

BASE M/Z: 43
RIC: 30303.



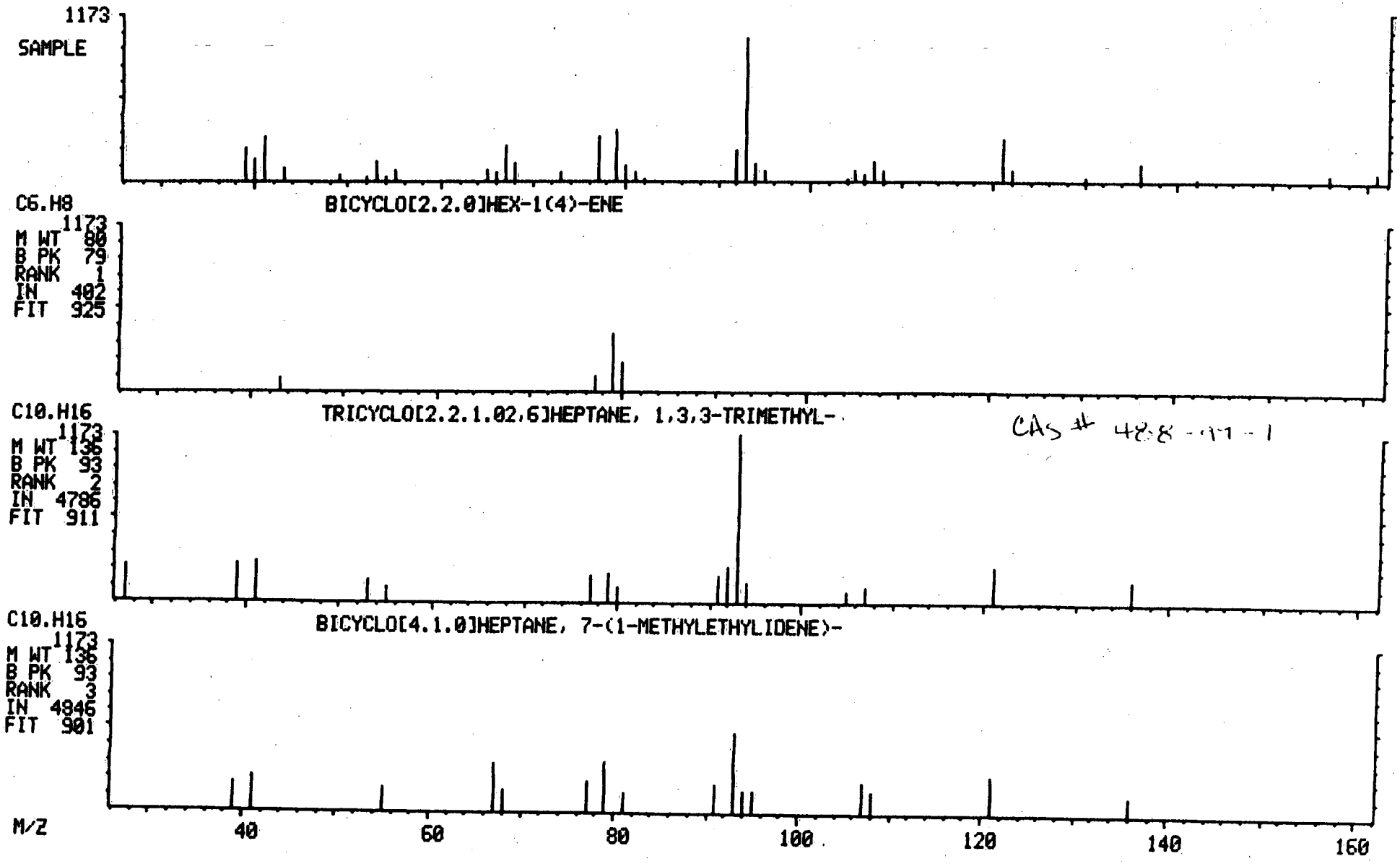

CAS # 108-08-7

18

MID LIBRARY SEARCH
08/20/87 9:20:00 + 29:14
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 # 877
CALI: VOA5806 # 2

BASE M/Z: 93
RIC: 6831.



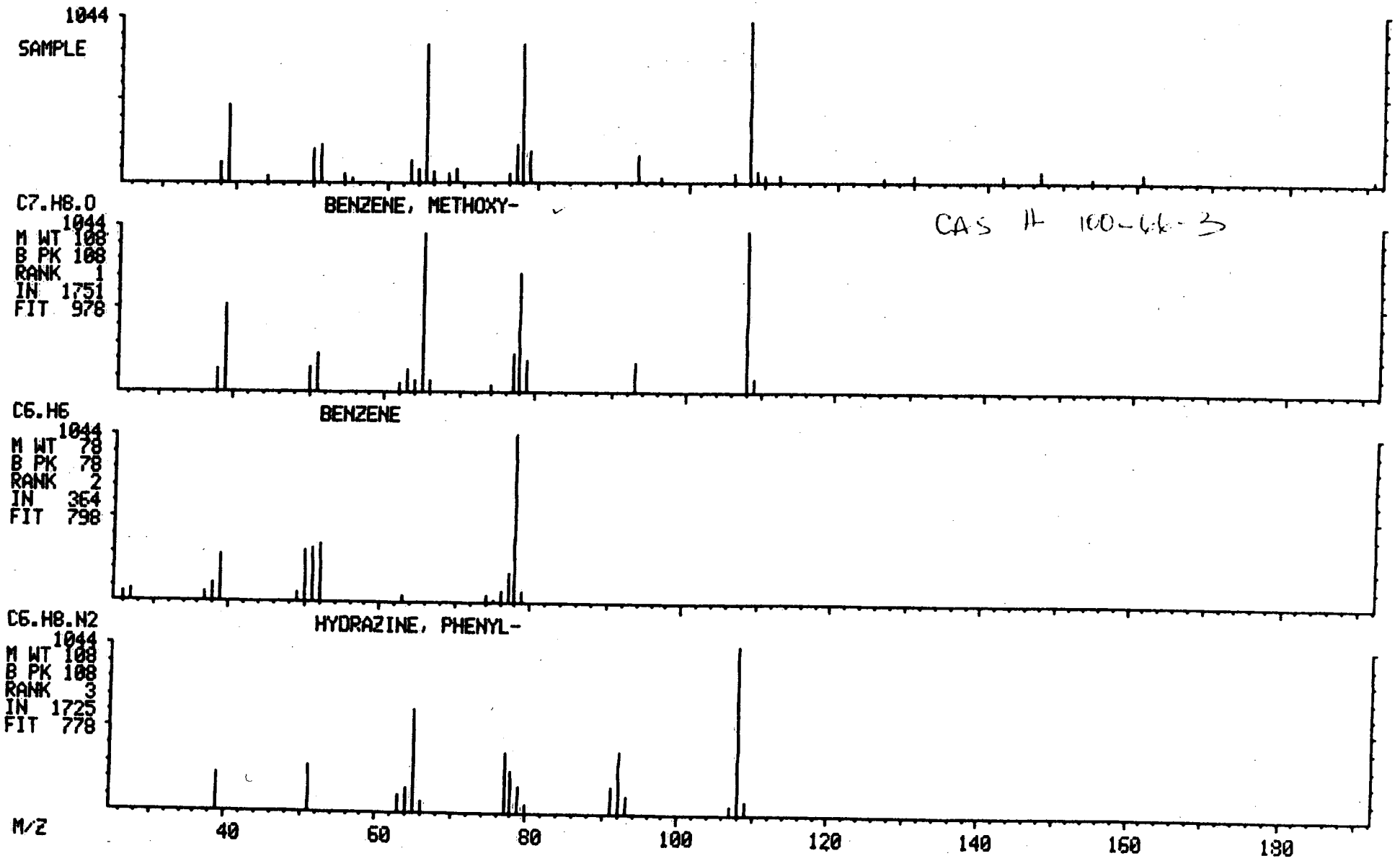

CAS # 488-99-1

8

MID LIBRARY SEARCH
08/20/87 9:20:00 + 31:04
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 # 932
CALI: VOA5806 # 2

BASE M/Z: 108
RIC: 6343.



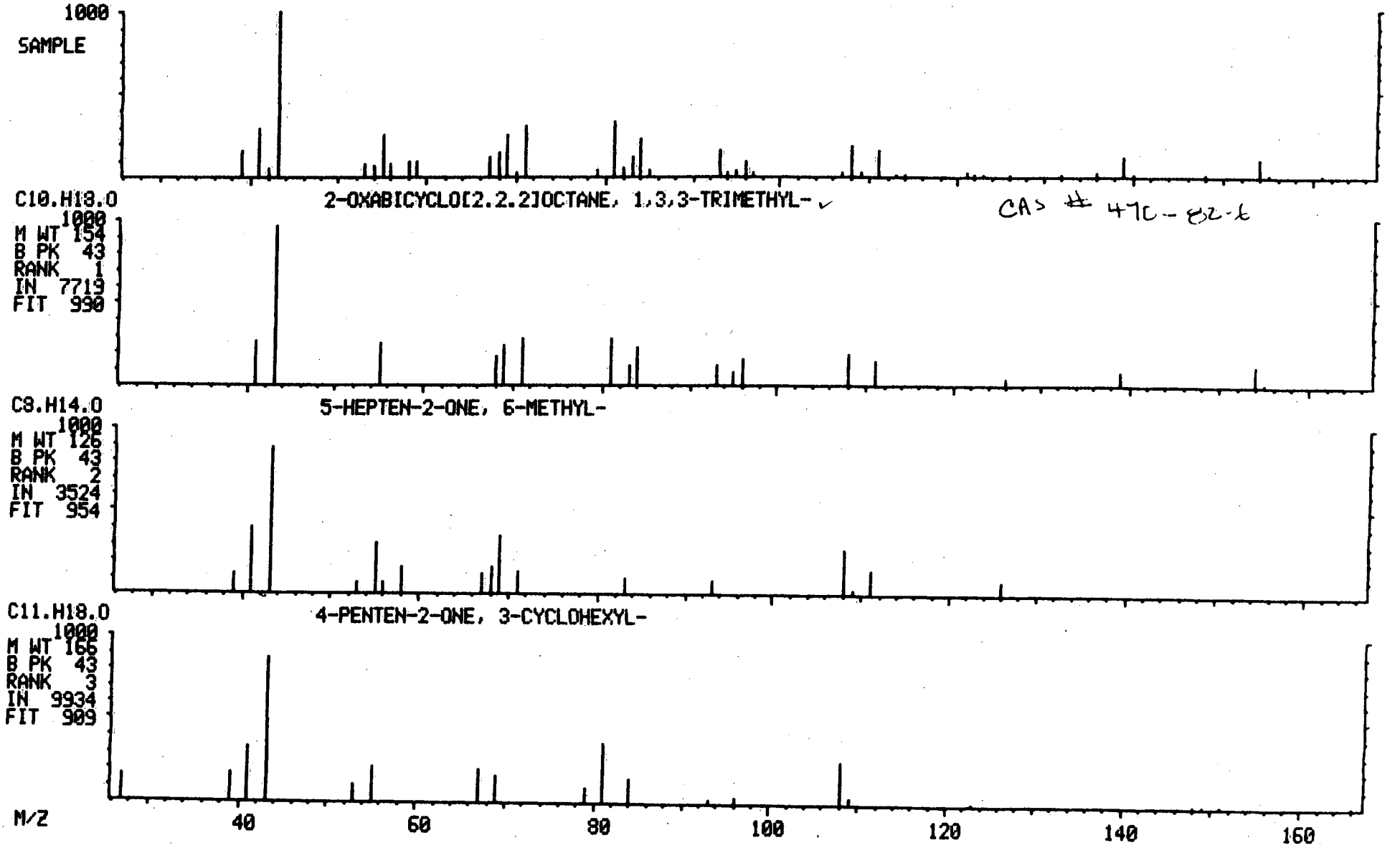

CAS # 100-66-3

83

MID LIBRARY SEARCH
08/20/87 9:20:00 + 31:50
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 # 955
CALI: VOA5806 # 2

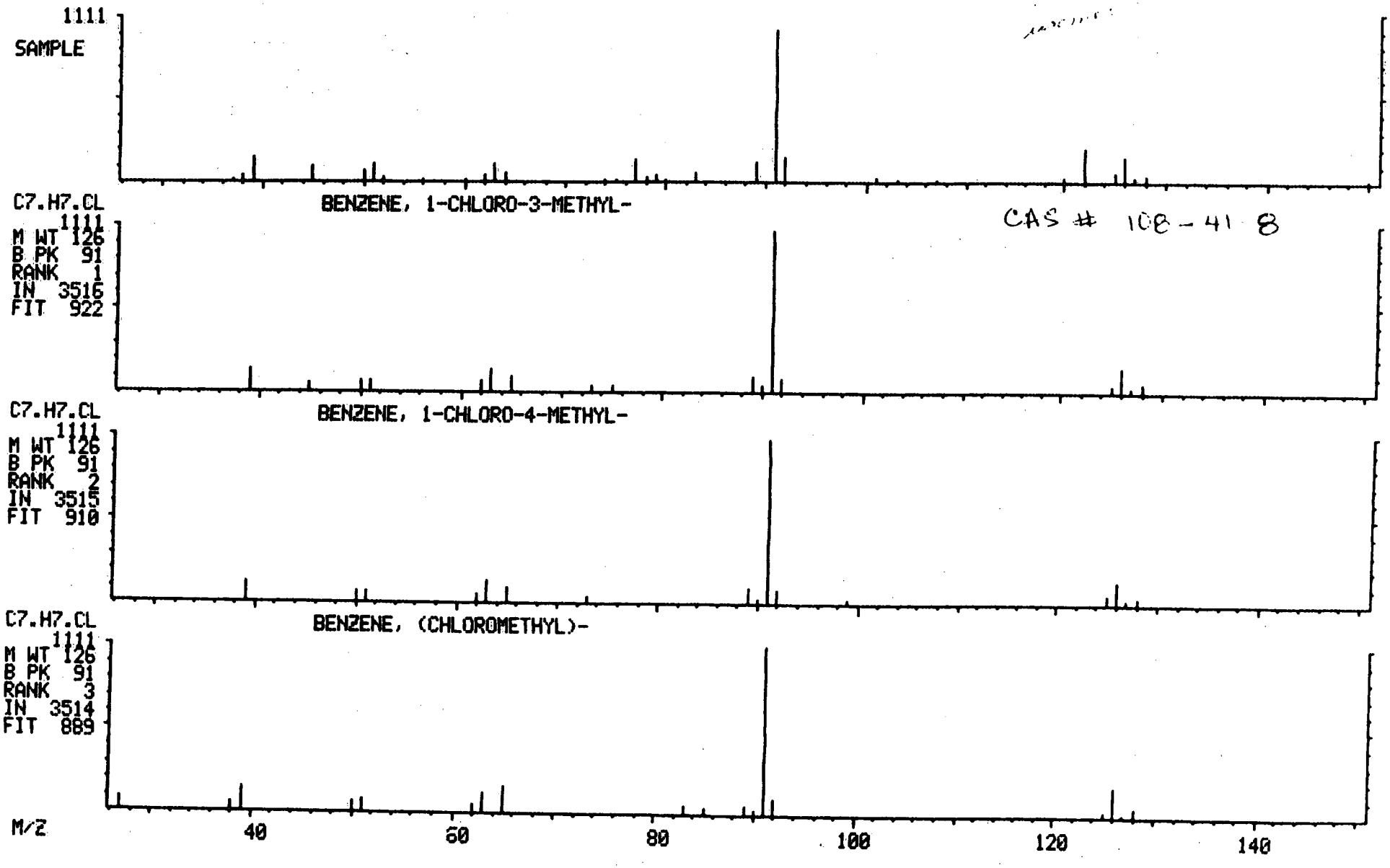
BASE M/Z: 43
RIC: 33343.



MID LIBRARY SEARCH
08/20/87 9:20:00 + 36:36
SAMPLE: GC/MS#1, 2033-6009 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5806 #1098
CALI: VOA5806 # 2

BASE M/Z: 91
RIC: 9583.

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# REAGENT BLANK SUMMARY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

| FILE ID | DATE OF ANALYSIS | FRACTION | MATRIX | CONC. LEVEL | INST. ID | CAS NUMBER | COMPOUND (INCL. TIC OR UNKNOWN) | CONC. | UNITS | CRQL |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA 5810 | 8/20/87 | VOA | WATER | Low | 5700 | N/A | Methylene Chloride | 4J | ug/L | 5 |

Comments:

FORM IV

4/84

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# CHAIN OF CUSTODY RECORD

Log Book Pg. No. 10/11

Project Name/Number ORBIS P87-304 | Sample Date: 8-7-87

| ETK Lab # Sample # | Sub | Field Sample No. A | Field Sample No. B | Time | Sample Location | Sample Depth | Sample Type | No. of Containers | Metals | GC/MS Organics | Other Organics | Nutrients | S.D.W.A. | Solids | Bacty | TC/FC | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | P304 | 6007 | 11:20 | OB-4 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | ALL SAMPLES |
| | | P304 | 6008 | 11:35 | OB-7 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | OBTAINED FROM |
| | | P304 | 6009 | 11:50 | OB-8 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | TEST PITS IN |
| | | P304 | 6010 | 12:00 | OB-5 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | U.G. STORAGE |
| | | | | | | | | | | | | | | | | | TANK (REMOVED) AREA |

Section | Option — See options below

| Metals -M- | GC/MS Organics -G- | Organics (Other) -Q- | Nutrients - Minerals -N- | S.D.W.A. Conven. Analysis -S- | Solid Series / pH Conductivity |
|---|---|---|---|---|---|
| **"A" Priority Metals**<br>As Sb Be Cd<br>Cr Cu Pb Hg<br>Ni Se Ag Tl<br>Zn | **"A" P.P. + 40**<br>VOAs + 15<br>A/BNs + 25<br>Pesticides & PCBs | **"A" PHC**<br>Petroleum Hydrocarbons | **"A" Nutrients**<br>Ammonia<br>Nitrate<br>Nitrite<br>Total Phosphorus<br>TKN | **Primary:**<br>Fl⁻ Turb. $NO_3$-N<br>**Secondary:**<br>pH TDS Alk.<br>Hardness L.I. $SO_4$<br>Cl⁻ F⁻ M.B.A.S. | TS TDS<br>TSS TVDS<br>pH TVSS<br>Conductivity |
| **"B" S.D.W.A.**<br>**Primary:**<br>As Ba Cd Cr<br>Pb Na Hg Se Ag<br>**Secondary:**<br>Cu Fe Mn Zn | **"B" P.P. — No Searches**<br>VOAs<br>A/BNs<br>Pesticides & PCBs | **"B" O & G**<br>Oil & Grease | **"B" Minerals**<br>Alk. Cl⁻<br>pH F⁻<br>Hard. $SO_4$<br>L.I. Turb. | | |
| **"C" Misc. Metals**<br>Cr+6 Fe Mn<br>Na Ba K<br>Ca Mg | **"C" VOAs only**<br>A. Searches<br>B. No Searches<br>C. Specific: _____ | **"C" Total Phenols**<br>Total Phenols | **"C" Oxygen Demand**<br>B.O.D. C.O.D.<br>A. Total<br>B. Soluable | | |
| **"D" List (others)**<br>___ ___ ___<br>___ ___ ___<br>___ ___ ___ | **"D" A-280**<br>A-280 Parameters<br>S.D.W.A. | **"D" Cyanide**<br>Cyanide | **"D" Misc. List**<br>___ ___ ___<br>___ ___ ___<br>___ ___ ___ | | |

| Bottles/Samplers Prepared by: | Date | Time |
|---|---|---|
| KJA | 8/6/87 | 1000 |
| **Sampled by:** | **Date** | **Time** |
| KE Kaul | 8/7/87 | see above |
| **Received by:** | **Date** | **Time** |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| **Lab. Received by:** | **Date** | **Time** |
| [illegible] | 8/7/87 | 1315 |

2033

2 of 3

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**Elson T. Killam Associates, Inc.**

27 Bleeker Street, P.O. Box 1008, Millburn, NJ 07041
Tel. 201/379-3400 Telex 642-057 Telecopier 201/376-1072

Environmental and Hydraulic Engineers

# ANALYTICAL DATA REPORT

**ORBIS PRODUCTS CORP.**

**NEWARK, NEW JERSEY**

**U.G. STORAGE TANK AREA**

**PROJECT NUMBER:** P87-304

**LABORATORY REFERENCE NUMBER:** 2033-6010

**DATE AND TIME COLLECTED:** 8/7/87 12:00

Nancy J. Potak
LABORATORY DIRECTOR

SEPTEMBER 24, 1987

N.J. LABORATORY
CERTIFICATION NO.: 07059

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Elson T. Killam Associates, Inc.

# LABORATORY CHRONICLE

**LABORATORY SAMPLE NO.:** 2033-6010

**RECEIVED:** 8/7/87

**ORGANICS:**

**EXTRACTION:**

**ANALYSES:**

1. **VOLATILE COMPOUNDS:** 8/20/87
2. **ACID EXTRACTABLES:**
3. **BASE/NEUTRALS:**
4. **PESTICIDES/PCBs:**

**METALS:**

**DIGESTION:**

**ANALYSES:**

| OTHER ANALYSES: | EXTRACTED: | ANALYSES: |
|---|---|---|
| PHC | 8/13/87 | 8/14/87 |

**QUALITY CONTROL SUPERVISOR REVIEW AND APPROVAL:** [illegible]

# METHODOLOGY SUMMARY

**Purgeable Organics**

USEPA METHOD 624

**Acid Extractables**

**Base/Neutral Extractables**

**PESTICIDE EXTRACTABLES**

**Metals**

**Total Cyanide**

**Total Phenol**

**Other** PHC - USEPA METHOD 418.1 (Modified for soil)

# PETROLEUM HYDROCARBONS DATA

LABORATORY SAMPLE NO.: 2033-6010

| | CONCENTRATION DRY WEIGHT (mg/Kg) | DETECTION LIMIT (mg/Kg) |
|---|---|---|
| PETROLEUM HYDROCARBONS | 73 | 33 |

BDL = BELOW DETECTION LIMIT

## PETROLEUM HYDROCARBONS
## MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

**LAB REFERENCE ID NO.:** 2033-6010 **QUALITY ASSURANCE SAMPLE:** 2033-6006

| LAB SAMPLE NO. | CONC. SPIKE ADDED | SAMPLE CONC. | CONC. MS | % REC | CONC. MSD | % REC | RPD |
|---|---|---|---|---|---|---|---|
| 2033-6006..... | 610 | <30 | 612 | 100 | 632 | 104 | 4 |

Concentration - mg/kg
RPD - relative percent difference

## DATA QUALIFIERS

The following four qualifiers are used in the analytical report package. They are equivalent to those issued by EPA - Contract Laboratory Program:

U - Indicates that the compound was analyzed for but not detected. All sample detection limits reported have been corrected for dilution and per cent moisture. No adjustements for blank contamination have been made.

J - Refers to an estimated value. This is used when the mass spectral data indicates the presence of a compound that meets the identification criteria, yet has a concentration less than the contract required detection limit. All estimated values reported have been adjusted for both dilution and per cent moisture, but no corrections have been made for possible blank contamination.

B - This flag is used to note that the compound was found to be present in the laboratory blank as well as in the sample. It indicates that the possibility of laboratory contamination exists.

The EPA has issued certain quidelines to aid in the evaluation of data when common laboratory artifacts occur. Blank contribution is considered to be negligable if it is ten times less than the concentration present in the sample. If the concentrations of the compounds found in both the sample and the blank are comparable (i.e. sample concentration is less than twice that of the blank), the occurance of the compound in the sample is considered to be suspect.

Up to 25 ppb of methylene chloride is permitted to be present in the blanks of volatile organic analyses.

C - Applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ul in the final extract are confirmed by GC/MS.

The next qualifier is also used in referencing the analytical results:

X - This flag indicates the presence of a compound which is often found as a common laboratory or field contaminant.

# VOLATILE COMPOUNDS DATA

**LABORATORY SAMPLE NO.:** 2033-6010( 1/10 DIL ) **DATA FILE NO.:** VOA5804

**% SOLIDS:** 78.5

| | CONCENTRATION (ug/Kg) | | SCAN | DETECTION LIMIT (ug/Kg) |
|---|---|---|---|---|
| ACROLEIN | | U | | 1300. |
| ACRYLONITRILE | | U | | 1300. |
| BENZENE | 6200 | | 602 | 64. |
| BROMOFORM | | U | | 64. |
| BROMOMETHANE | | U | | 130. |
| CARBON TETRACHLORIDE | | U | | 64. |
| CHLOROBENZENE | | U | | 64. |
| DIBROMOCHLOROMETHANE | | U | | 64. |
| CHLOROETHANE | | U | | 130. |
| 2-CHLORO ETHYL VINYL ETHER | | U | | 130. |
| CHLOROFORM | | U | | 64. |
| CHLOROMETHANE | | U | | 64. |
| BROMODICHLOROMETHANE | | U | | 64. |
| 1,1-DICHLOROETHANE | | U | | 64. |
| 1,2-DICHLOROETHANE | | U | | 64. |
| 1,1-DICHLOROETHENE | | U | | 64. |
| TRANS-1,2-DICHLOROETHENE | | U | | 64. |
| 1,2-DICHLOROPROPANE | | U | | 64. |
| CIS-1,3-DICHLOROPROPENE | | U | | 64. |
| TRANS-1,3-DICHLOROPROPENE | | U | | 64. |
| ETHYLBENZENE | | U | | 64. |
| METHYLENE CHLORIDE | 44 | JB | 281 | 64. |
| 1,1,2,2-TETRACHLOROETHANE | | U | | 64. |
| TETRACHLOROETHENE | | U | | 64. |
| TOLUENE | 440 | | 793 | 64. |
| 1,1,1-TRICHLOROETHANE | | U | | 64. |
| 1,1,2-TRICHLOROETHANE | | U | | 64. |
| TRICHLOROETHENE | | U | | 64. |
| VINYL CHLORIDE | | U | | 130. |
| ACETONE - HSL | | U | | 130. |
| CARBON DISULFIDE - HSL | | U | | 64. |
| 2-HEXANONE - HSL | | U | | 130. |
| 2-BUTANONE | 200 | | 455 | 130. |
| 4-METHYL-2-PENTANONE -HSL | | U | | 130. |
| STYRENE - HSL | | U | | 64. |
| TOTAL XYLENES - HSL | | U | | 64. |

Laboratory Name E.T. Killam Assoc.

Case No

| Sample Number |
|---|
| 2033-6010 |

## Organics Analysis Data Sheet
(Page 4)

### Tentatively Identified Compounds

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. | UNKNOWN | VOA | 645 | 160 |
| 2. 470-82-6 | 2-OXABICYCLO[2.2.2]OCTANE, | | | |
| 3. | 1,3,3-TRIMETHYL | VOA | 953 | 1500 |
| 4. 76-22-2 | BICYCLO[2.2.1]HEPTAN-2-ONE, | | | |
| 5. | 1,7,7-TRIMETHYL | VOA | 1030 | 220 |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. | | | | |
| 13. | | | | |
| 14. | | | | |
| 15. | | | | |
| 16. | | | | |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. | | | | |
| 21. | | | | |
| 22. | | | | |
| 23. | | | | |
| 24. | | | | |
| 25. | | | | |
| 26. | | | | |
| 27. | | | | |
| 28. | | | | |
| 29. | | | | |
| 30. | | | | |

# METHOD PERFORMANCE DATA

## SOILS SURROGATE PERCENT RECOVERY

LABORATORY SAMPLE NO.: 2033-6010

| COMPOUND | RECOVERY | EPA CONTROL LIMITS | SCAN # |
|---|---|---|---|
| **VOLATILE FRACTION** | | | |
| TOLUENE - D8 | 100 | 81-117 | 788 |
| BROMOFLUOROBENZENE | 92 | 74-121 | 969 |
| 1,2-DICHLOROETHANE | 100 | 70-121 | 457 |
| **SEMI-VOLATILE FRACTION** | | | |
| NITROBENZENE-D5 | - | 23-120 | - |
| 2-FLUOROBIPHENYL | - | 30-116 | - |
| TERPHENYL-D14 | - | 18-137 | - |
| PHENOL-D5 | - | 24-113 | - |
| 2-FLUOROPHENOL | - | 26-121 | - |
| 2,4,6-TRIBROMOPHENOL | - | 19-122 | - |
| **PESTICIDE** | | | |
| DIBUTYL CHLORENDATE | - | 20-150** | - |

*VALUES ARE OUTSIDE QC LIMITS
**ADVISORY LIMITS ONLY

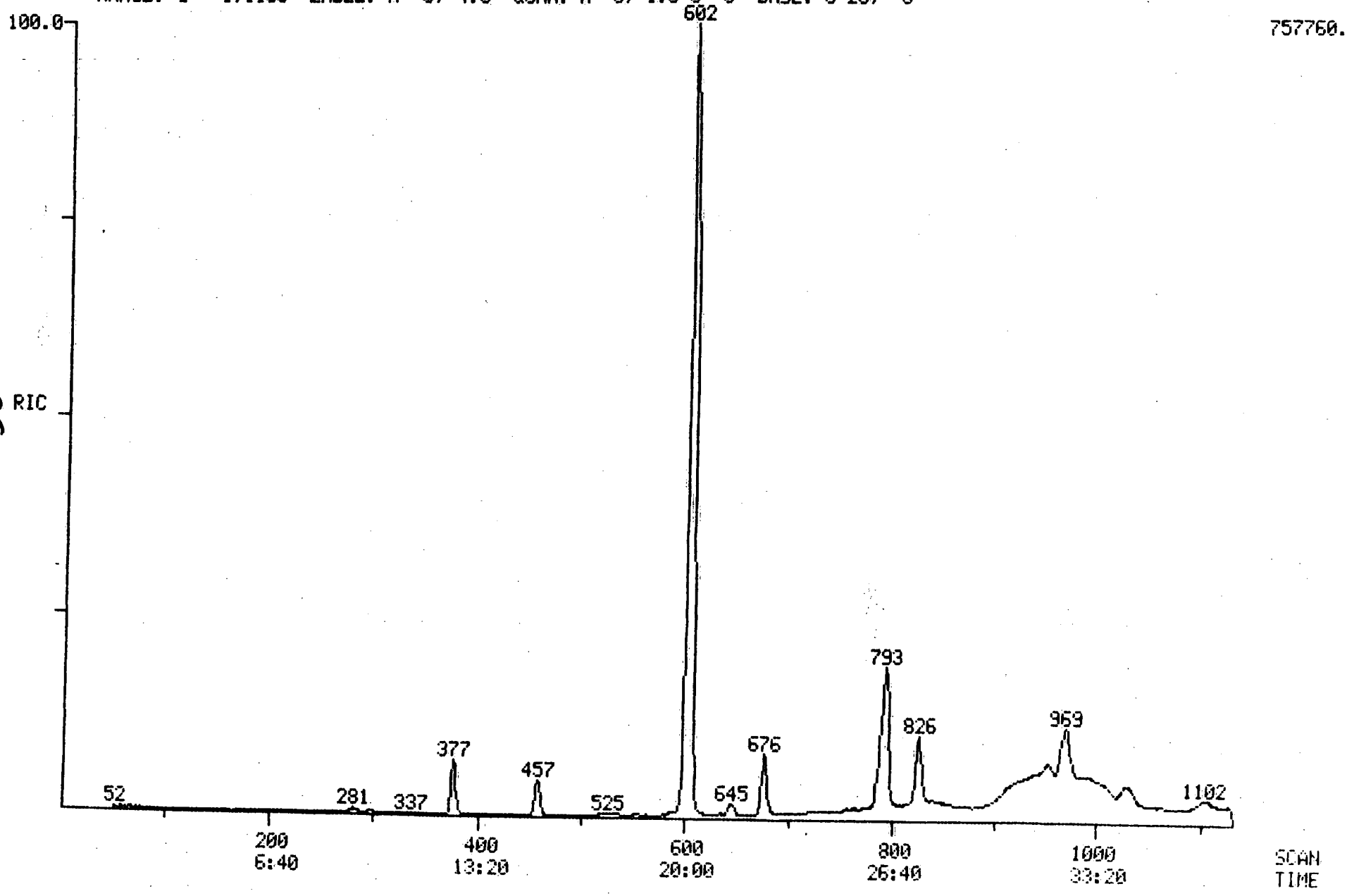
# INTERNAL STANDARD SCAN LIST
# (RETENTION TIME)

LABORATORY SAMPLE NO.: 2033-6010

| INTERNAL STANDARD | SCAN # |
|---|---|
| **VOLATILE FRACTION** | |
| BROMOCHLOROMETHANE | 377 |
| 1,4-DIFLUOROBENZENE | 676 |
| CHLOROBENZENE-D5 | 826 |

| SEMI-VOLATILE FRACTION | SCAN # |
|---|---|
| 1,4-DICHLOROBENZENE-D4 | - |
| NAPTHALENE-D8 | - |
| ACENAPTHENE-D10 | - |
| PHENANTHRENE-D10 | - |
| CHRYSENE-D12 | - |
| PERYLENE-D12 | - |

MIDRIC DATA: VOA5804 #1 SCANS 1 TO 1130
08/20/87 7:44:00 CALI: VOA5804 #2
SAMPLE: GC/MS#1, 2033-6010 (1/10 DILUTION)
CONDS.: 624
RANGE: G 1,1130 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

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# SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Low Level X Medium Level _____

| FRACTION | COMPOUND | CONC. SPIKE ADDED (ug/Kg) | SAMPLE RESULT | CONC. MS | % REC | CONC. MSD | % REC | RPD | QC LIMITS* RPD | QC LIMITS* RECOVERY |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA SMO SAMPLE NO. 2033 6004 | 1,1-Dicholorethene | 50 | 0 | 38 | 76 | 47 | 94 | 10 | 22 | 59-172 |
| | Trichloroethene | 50 | 0 | 40 | 80 | 46 | 92 | 7 | 24 | 62-137 |
| | Chlorobenzene | 50 | 0 | 46 | 92 | 53 | 106 | 7 | 21 | 60-133 |
| | Toluene | 50 | 7 | 43 | 86 | 54 | 108 | 11 | 21 | 59-139 |
| | Benzene | 50 | 3 | 47 | 94 | 53 | 106 | 6 | 21 | 66-142 |
| B/N SMO SAMPLE NO. | 1,2,4-Trichlorobenzene | | | | | | | | 23 | 38-107 |
| | Acenaphthene | | | | | | | | 19 | 31-137 |
| | 2,4 Dinitrotoluene | | | | | | | | 47 | 28-89 |
| | Di-n-Butylphthalate | | | | | | | | 47 | 29-135 |
| | Pyrene | | | | | | | | 36 | 35-142 |
| | N-Nitrosodi-n-Propylamine | | | | | | | | 38 | 41-126 |
| | 1,4-Dichlorobenzene | | | | | | | | 27 | 28-104 |
| ACID SMO SAMPLE NO. | Pentachlorophenol | | | | | | | | 47 | 17-109 |
| | Phenol | | | | | | | | 35 | 26-90 |
| | 2-Chlorophenol | | | | | | | | 50 | 25-102 |
| | 4-Chloro-3-Methylphenol | | | | | | | | 33 | 26-103 |
| | 4-Nitrophenol | | | | | | | | 50 | 11-114 |
| PEST SMO SAMPLE NO. | Lindane | | | | | | | | 50 | 46-127 |
| | Heptachlor | | | | | | | | 31 | 35-130 |
| | Aldrin | | | | | | | | 43 | 34-132 |
| | Dieldrin | | | | | | | | 38 | 31-134 |
| | Endrin | | | | | | | | 45 | 42-139 |
| | 4,4'-DDT | | | | | | | | 50 | 23-134 |

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 0 out of 5 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

RECOVERY: VOAs 0 out of 10 : outside QC limits
B/N _____ out of _____ : outside QC limits
ACID _____ out of _____ : outside QC limits
PEST _____ out of _____ : outside QC limits

Comments: _____



99

# GC/MS TUNING AND MASS CALIBRATION

## Bromofluorobenzene (BFB)

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Instrument ID 5100 Date 8/20/87 Time 5:21 + 32:20

Lab ID VOA 5801 Data Release Authorized By: JEF

| m/e | ION ABUNDANCE CRITERIA | %RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of the base peak | 18.11 |
| 75 | 30.0 - 60.0% of the base peak | 40.94 |
| 95 | Base peak, 100% relative abundance | 100.00 |
| 96 | 5.0 - 9.0% of the base peak | 5.76 |
| 173 | Less than 1.0% of the base peak | <1 |
| 174 | Greater than 50.0% of the base peak | 72.58 |
| 175 | 5.0 - 9.0% of mass 174 | 5.20 (7.16)[1] |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 70.66 (97.4)[1] |
| 177 | 5.0 - 9.0% of mass 176 | 4.48 (6.34)[2] |

[1] Value in parenthesis is % mass 174.
[2] Value in parenthesis is % mass 176.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

| SAMPLE ID | LAB ID | DATE OF ANALYSIS | TIME OF ANALYSIS |
|---|---|---|---|
| 50 ug/L VOA Std | VOA 5801 | 8/20/87 | 5:21 |
| 2033-6007 (1/10 D.L.) | VOA 5802 | " | 6:09 |
| BLANK | VOA 5803 | " | 6:56 |
| 2033-6010 (1/10 D.L.) | VOA 5804 | " | 7:44 |
| BLANK | VOA 5805 | " | 8:32 |
| 2033-6009 (1/10 D.L.) | VOA 5806 | " | 9:20 |
| BLANK | VOA 5807 | " | 10:07 |
| 2033-6008 (1/10 D.L.) | VOA 5808 | " | 10:55 |
| N/A | VOA 5809 | " | N/A |
| BLANK | VOA 5810 | " | 12:30 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |



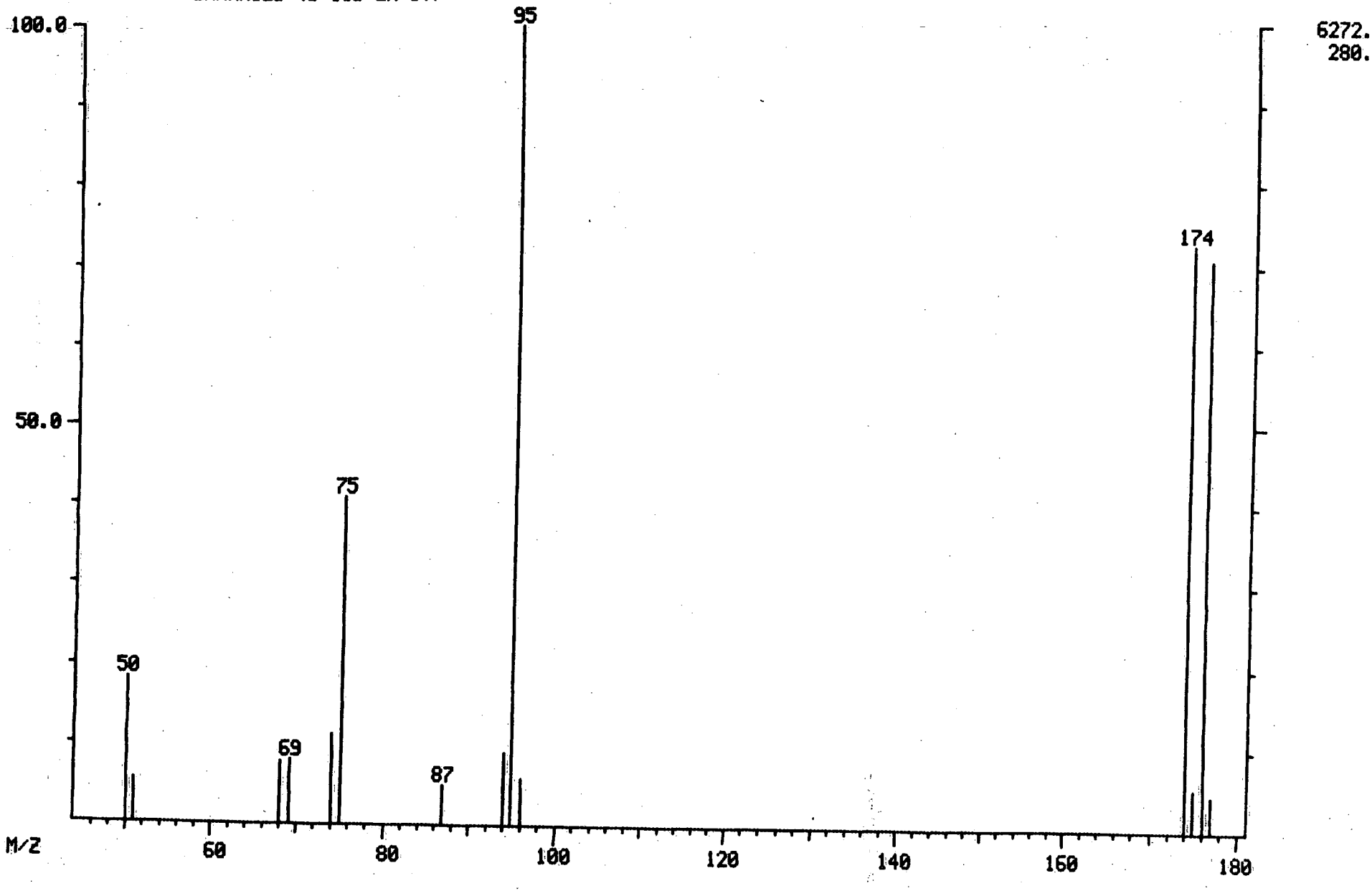
FORM V

4/84

MID MASS SPECTRUM
08/20/87 5:21:00 + 32:20
SAMPLE: GC/MS#1, @ 50 UG/L VOAHSL STD.
CONDS.: 624
GC TEMP: 239 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: VOA5801 #970
CALI: VOA5801 #2

BASE M/Z: 95
RIC: 27424.

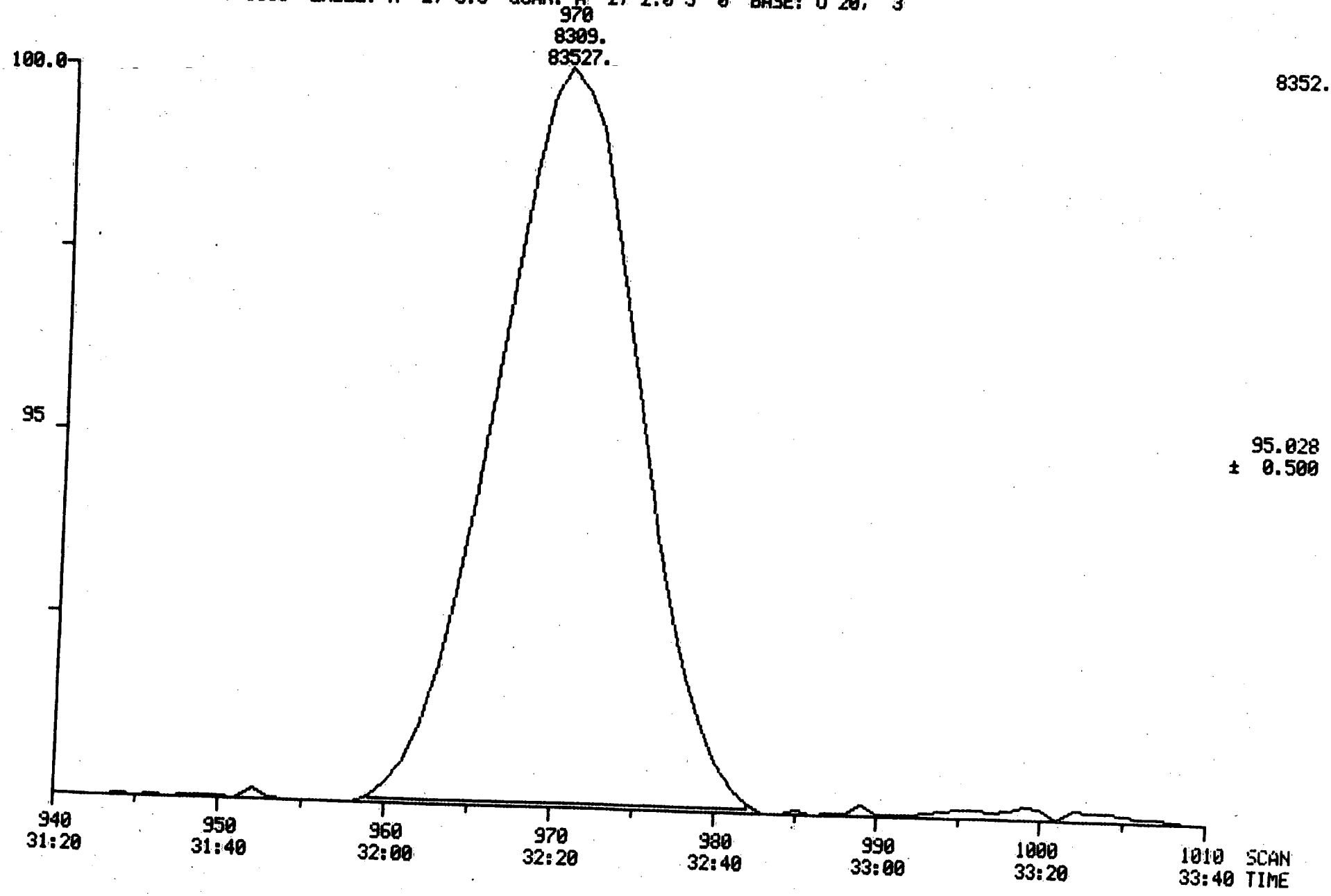



101

MIDMASS CHROMATOGRAM
08/20/87 5:21:00
SAMPLE: GC/MS#1, @ 50 UG/L VOAHSL STD.
CONDS.: 624
RANGE: G 1,1130 LABEL: N 2, 3.0 QUAN: A 2, 2.0 J 0 BASE: U 20, 3

DATA: VOA5801 #970
CALI: VOA5801 #2

SCANS 940 TO 1010




108

# MASS SPECTRAL DATA

# FOR

# TENTATIVELY IDENTIFIED COMPOUNDS

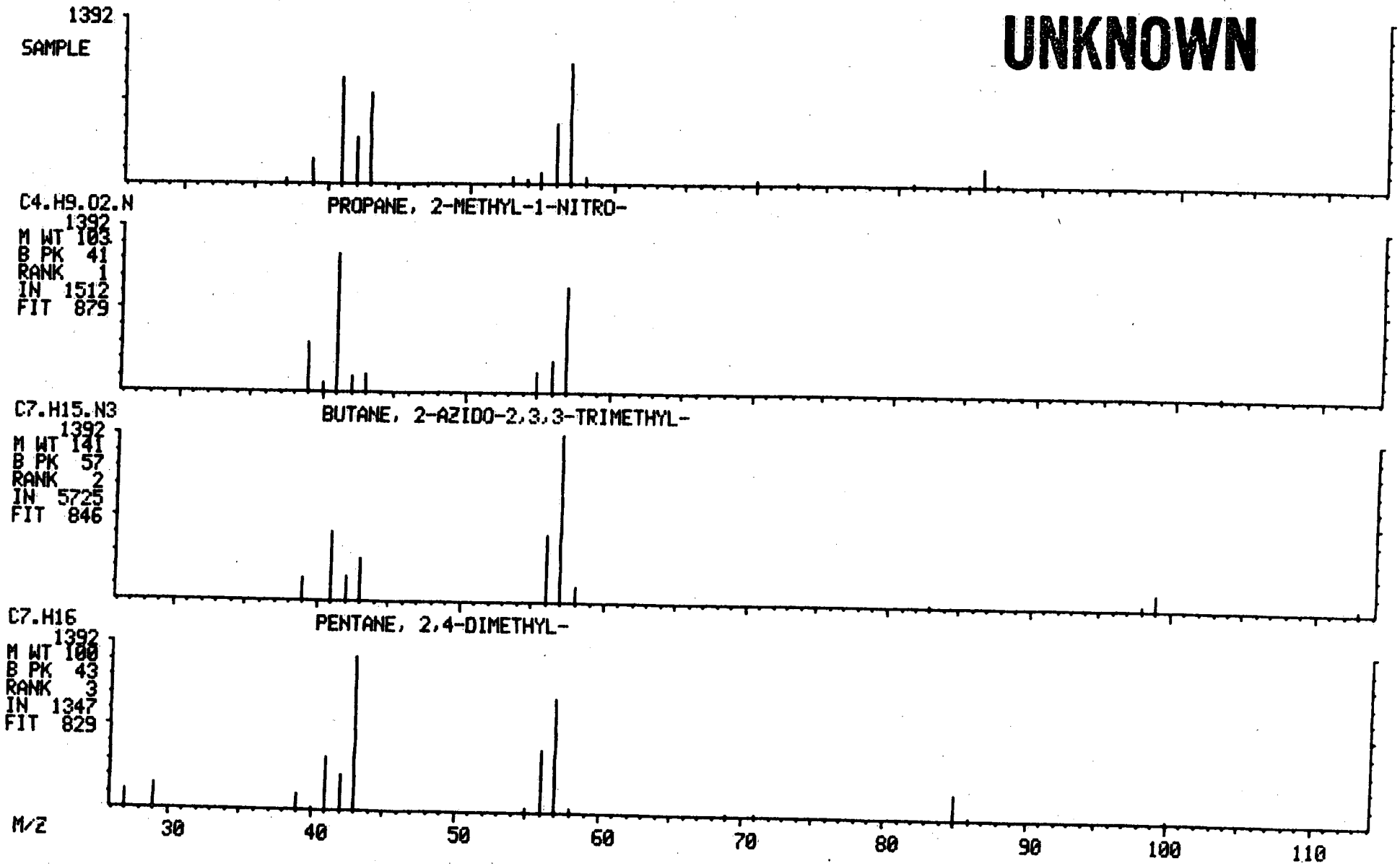
For each tentatively identified compound, a mass spectrum of the detected compound is provided with the mass spectrums of the three best matches from the NBS Library search. When the library search does not produce an adequate match, the detected compound is labelled as "unknown".

MID LIBRARY SEARCH
08/20/87 7:44:00 + 21:30
SAMPLE: GC/MS#1, 2033-6010 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5804 # 645
CALI: VOA5804 # 2

BASE M/Z: 57
RIC: 10431.

**UNKNOWN**

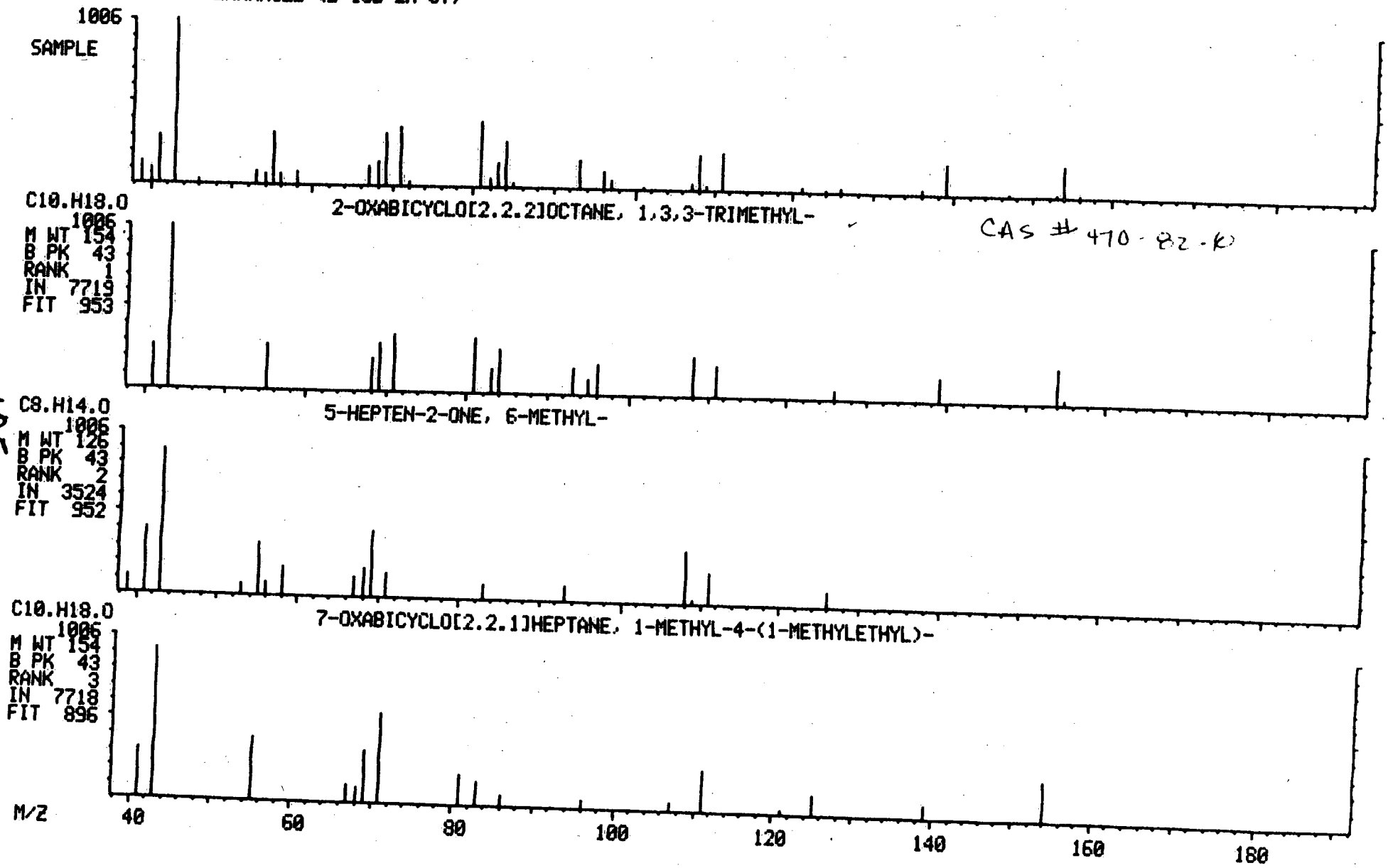



104

MID LIBRARY SEARCH
08/20/87 7:44:00 + 31:46
SAMPLE: GC/MS#1, 2033-6010 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5804 # 953
CALI: VOA5804 # 2

BASE M/Z: 43
RIC: 11503.



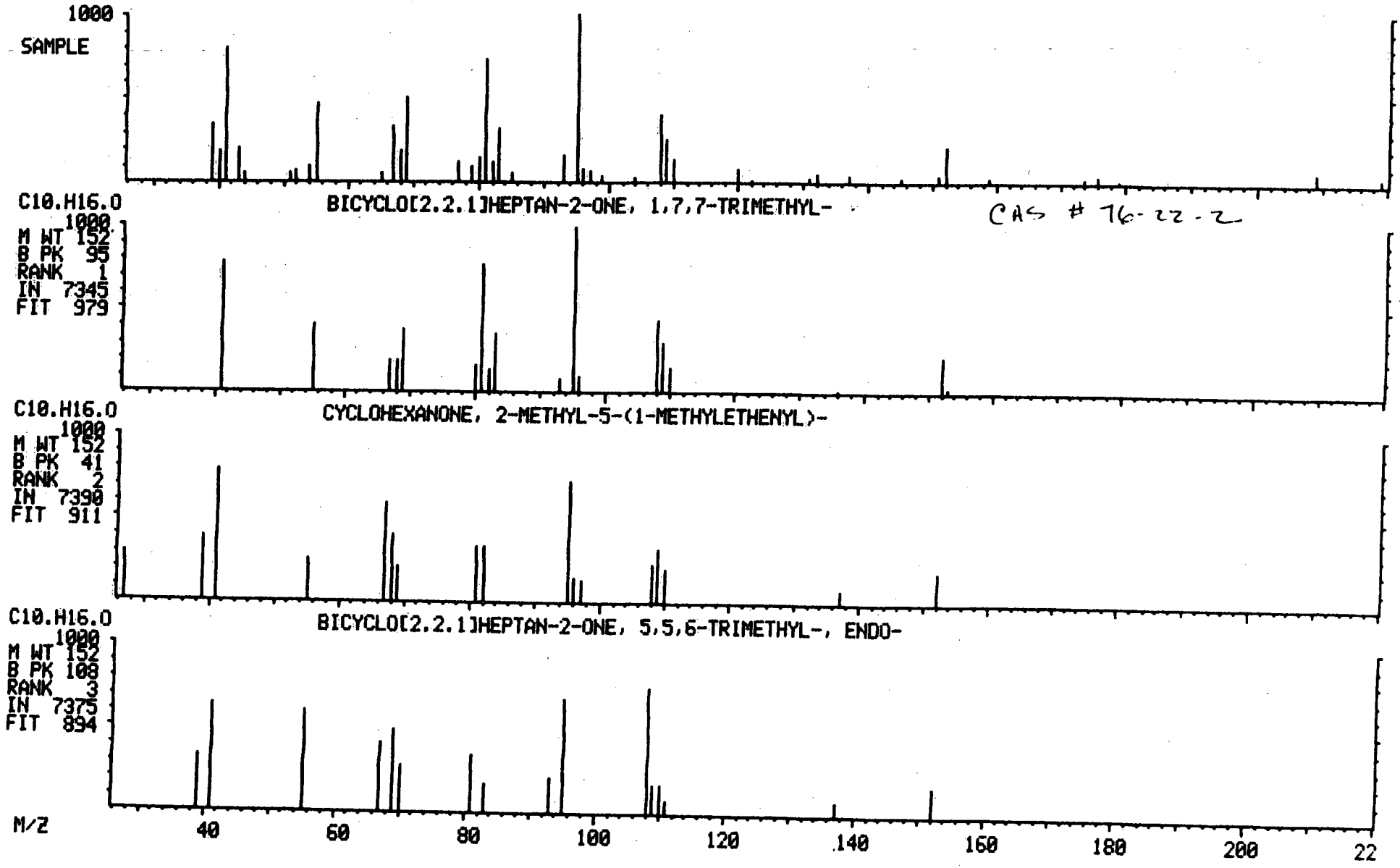

CAS # 470-82-6

105

MID LIBRARY SEARCH
08/20/87 7:44:00 + 34:20
SAMPLE: GC/MS#1, 2033-6010 (1/10 DILUTION)
CONDS.: 624
ENHANCED (S 15B 2N 0T)

DATA: VOA5804 #1030
CALI: VOA5804 # 2

BASE M/Z: 95
RIC: 8943.

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# REAGENT BLANK SUMMARY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

| FILE ID | DATE OF ANALYSIS | FRACTION | MATRIX | CONC. LEVEL | INST. ID | CAS NUMBER | COMPOUND (INCL. TIC OR UNKNOWN) | CONC. | UNITS | CRQL |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA 5810 | 8/20/87 | VOA | WATER | Low | 5700 | N/A | Methylene Chloride | 4.5 | ug/L | 5 |

Comments:

FORM IV

4/84

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# CHAIN OF CUSTODY RECORD

Log Book Pg. No. 10/11

Project Name/Number ORBIS P87-304 | Sample Date: 8-7-87

— See options below

| ETK Lab # Sample # | Sub | Field Sample No. A | B | Time | Sample Location | Sample Depth | Sample Type | No. of Containers | Section / Option: Metals (A B C D) | GC/MS Organics (A B C D) | Other Organics (A B C D) | Nutrients (A B C D) | S.D.W.A. | Solids | Bacty | TC/FC | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | P304 | 6007 | 11:20 | OB-4 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | ALL SAMPLES |
| | | P304 | 6008 | 11:35 | OB-7 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | OBTAINED FROM |
| | | P304 | 6009 | 11:50 | OB-8 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | TEST PITS IN |
| | | P304 | 6010 | 12:00 | OB-5 "TANK | 6.5 | SOIL | 1 | | C | A | | | | | | U.G. STORAGE |
| | | | | | | | | | | | | | | | | | TANK (REMOVED) AREA |

| Metals -M- | GC/MS Organics -G- | Organics (Other) -Q- | Nutrients - Minerals -N- | S.D.W.A. Conven. Analysis -S- | Solid Series / pH Conductivity |
|---|---|---|---|---|---|
| "A" Priority Metals<br>As Sb Be Cd<br>Cr Cu Pb Hg<br>Ni Se Ag Tl<br>Zn | "A" P.P. + 40<br>VOAs + 15<br>A/BNs + 25<br>Pesticides & PCBs | "A" PHC<br>Petroleum Hydrocarbons | "A" Nutrients<br>Ammonia<br>Nitrate<br>Nitrite<br>Total Phosphorus<br>TKN | Primary:<br>$Fl^-$ Turb. $NO_3$-N<br>Secondary:<br>pH TDS Alk.<br>Hardness L.I. $SO_4$<br>$Cl^-$ $F^-$ M.B.A.S. | TS TDS<br>TSS TVDS<br>pH TVSS<br>Conductivity |
| "B" S.D.W.A.<br>Primary:<br>As Ba Cd Cr<br>Pb Na Hg Se Ag<br>Secondary:<br>Cu Fe Mn Zn | "B" P.P. — No Searches<br>VOAs<br>A/BNs<br>Pesticides & PCBs | "B" O & G<br>Oil & Grease | "B" Minerals<br>Alk. $Cl^-$<br>pH $F^-$<br>Hard. $SO_4$<br>L.I. Turb. | | |
| "C" Misc. Metals<br>Cr+6 Fe Mn<br>Na Ba K<br>Ca Mg | "C" VOAs only<br>A. Searches<br>B. No Searches<br>C. Specific: _____ | "C" Total Phenols<br>Total Phenols | "C" Oxygen Demand<br>B.O.D. C.O.D.<br>A. Total<br>B. Soluable | | |
| "D" List (others) | "D" A-280<br>A-280 Parameters<br>S.D.W.A. | "D" Cyanide<br>Cyanide | "D" Misc. List | | |

| Bottles/Samplers Prepared by: | Date | Time |
|---|---|---|
| KAA | 8/6/87 | 1000 |
| **Sampled by:** | **Date** | **Time** |
| KE Kaul | 8/7/87 | see Above |
| **Received by:** | **Date** | **Time** |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| **Lab. Received by:** | **Date** | **Time** |
| J. Swanson | 8/7/87 | 1315 |

2033

2 of 3

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**Elson T. Killam Associates, Inc.**

27 Bleeker Street, P.O. Box 1008, Millburn, NJ 07041
Tel. 201/379-3400 Telex 642-057 Telecopier 201/376-1072

Environmental and Hydraulic Engineers

# ANALYTICAL DATA REPORT

**ORBIS PRODUCTS CORP.**

**NEWARK, NEW JERSEY**

**TRIP BLANK**

**PROJECT NUMBER:** P87-304

**LABORATORY REFERENCE NUMBER:** 2033-1001TB

**DATE AND TIME COLLECTED:** 8/7/87 8:30

Nancy J. Potak
LABORATORY DIRECTOR

SEPTEMBER 24, 1987

N.J. LABORATORY
CERTIFICATION NO.: 07059

Elson T. Killam Associates, Inc.

# LABORATORY CHRONICLE

**LABORATORY SAMPLE NO.:** 2033-1001TB

**RECEIVED:** 8/7/87

**ORGANICS:**

**EXTRACTION:**

**ANALYSIS:**

1. **VOLATILE COMPOUNDS:** 8/19/87
2. **ACID EXTRACTABLES:**
3. **BASE/NEUTRALS:**
4. **PESTICIDES/PCBs:**

**QUALITY CONTROL SUPERVISOR REVIEW AND APPROVAL:**

**METALS:**

**DIGESTION:**

**ANALYSIS:**

**OTHER ANALYSES:**

**QUALITY CONTROL SUPERVISOR REVIEW AND APPROVAL:** [illegible]

# METHODOLOGY SUMMARY

## Purgeable Organics

USEPA METHOD 624

## Acid Extractables

## Base/Neutral Extractables

## PESTICIDE EXTRACTABLES

## Metals

## Total Cyanide

## Total Phenol

## Other

## DATA QUALIFIERS

The following four qualifiers are used in the analytical report package. They are equivalent to those issued by EPA - Contract Laboratory Program:

U - Indicates that the compound was analyzed for but not detected. All sample detection limits reported have been corrected for dilution and per cent moisture. No adjustements for blank contamination have been made.

J - Refers to an estimated value. This is used when the mass spectral data indicates the presence of a compound that meets the identification criteria, yet has a concentration less than the contract required detection limit. All estimated values reported have been adjusted for both dilution and per cent moisture, but no corrections have been made for possible blank contamination.

B - This flag is used to note that the compound was found to be present in the laboratory blank as well as in the sample. It indicates that the possibility of laboratory contamination exists.

The EPA has issued certain quidelines to aid in the evaluation of data when common laboratory artifacts occur. Blank contribution is considered to be negligable if it is ten times less than the concentration present in the sample. If the concentrations of the compounds found in both the sample and the blank are comparable (i.e. sample concentration is less than twice that of the blank), the occurance of the compound in the sample is considered to be suspect.

Up to 25 ppb of methylene chloride is permitted to be present in the blanks of volatile organic analyses.

C - Applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ul in the final extract are confirmed by GC/MS.

The next qualifier is also used in referencing the analytical results:

X - This flag indicates the presence of a compound which is often found as a common laboratory or field contaminant.

# VOLATILE COMPOUNDS DATA

LABORATORY SAMPLE NO.: 2033-1001TB

DATA FILE NO.: VOA5785

| | CONCENTRATION (ug/Kg) | SCAN | DETECTION LIMIT (ug/Kg) |
|---|---|---|---|
| ACROLEIN | U | | 100. |
| ACRYLONITRILE | U | | 100. |
| BENZENE | U | | 5. |
| BROMOFORM | U | | 5. |
| BROMOMETHANE | U | | 10. |
| CARBON TETRACHLORIDE | U | | 5. |
| CHLOROBENZENE | U | | 5. |
| DIBROMOCHLOROMETHANE | U | | 5. |
| CHLOROETHANE | U | | 10. |
| 2-CHLORO ETHYL VINYL ETHER | U | | 10. |
| CHLOROFORM | U | | 5. |
| CHLOROMETHANE | U | | 10. |
| BROMODICHLOROMETHANE | U | | 5. |
| 1,1-DICHLOROETHANE | U | | 5. |
| 1,2-DICHLOROETHANE | U | | 5. |
| 1,1-DICHLOROETHENE | U | | 5. |
| TRANS-1,2-DICHLOROETHENE | U | | 5. |
| 1,2-DICHLOROPROPANE | U | | 5. |
| CIS-1,3-DICHLOROPROPENE | U | | 5. |
| TRANS-1,3-DICHLOROPROPENE | U | | 5. |
| ETHYLBENZENE | U | | 5. |
| METHYLENE CHLORIDE | 4 JB | 296 | 5. |
| 1,1,2,2-TETRACHLOROETHANE | U | | 5. |
| TETRACHLOROETHENE | U | | 5. |
| TOLUENE | U | | 5. |
| 1,1,1-TRICHLOROETHANE | U | | 5. |
| 1,1,2-TRICHLOROETHANE | U | | 5. |
| TRICHLOROETHENE | U | | 5. |
| VINYL CHLORIDE | U | | 10. |
| ACETONE - HSL | U | | 10. |
| CARBON DISULFIDE - HSL | U | | 5. |
| 2-HEXANONE - HSL | U | | 10. |
| 2-BUTANONE | U | | 10. |
| 4-METHYL-2-PENTANONE -HSL | U | | 10. |
| STYRENE - HSL | U | | 5. |
| TOTAL XYLENES - HSL | U | | 5. |

Laboratory Name E.T. Killam Assoc.

Case No

| Sample Number |
|---|
| 2033-100TB |

## Organics Analysis Data Sheet
(Page 4)

### Tentatively Identified Compounds

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. | NO COMPOUNDS FOUND | VOA | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. | | | | |
| 13. | | | | |
| 14. | | | | |
| 15. | | | | |
| 16. | | | | |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. | | | | |
| 21. | | | | |
| 22. | | | | |
| 23. | | | | |
| 24. | | | | |
| 25. | | | | |
| 26. | | | | |
| 27. | | | | |
| 28. | | | | |
| 29. | | | | |
| 30. | | | | |

# METHOD PERFORMANCE DATA

## WATER SURROGATE PERCENT RECOVERY

FIELD SAMPLE ID NO.: 2033-1001TB

| COMPOUND | RECOVERY | EPA CONTROL LIMITS | SCAN # |
|---|---|---|---|
| **VOLATILE FRACTION** | | | |
| TOLUENE - D8 | 96 | 88-110 | 838 |
| BROMOFLUOROBENZENE | 106 | 86-115 | 1028 |
| 1,2-DICHLOROETHANE | 86 | 76-114 | 485 |
| **SEMI-VOLATILE FRACTION** | | | |
| NITROBENZENE-D5 | - | 35-114 | - |
| 2-FLUOROBIPHENYL | - | 43-110 | - |
| TERPHENYL-D14 | - | 33-141 | - |
| PHENOL-D5 | - | 10-94 | - |
| 2-FLUOROPHENOL | - | 21-100 | - |
| 2,4,6-TRIBROMOPHENOL | - | 10-123 | - |
| **PESTICIDE** | | | |
| DIBUTYL CHLORENDATE | - | 24-156** | - |

*VALUES ARE OUTSIDE QC LIMITS
**ADVISORY LIMITS ONLY

# INTERNAL STANDARD SCAN LIST
# (RETENTION TIME)

LABORATORY SAMPLE NO.: 2033-1001TB

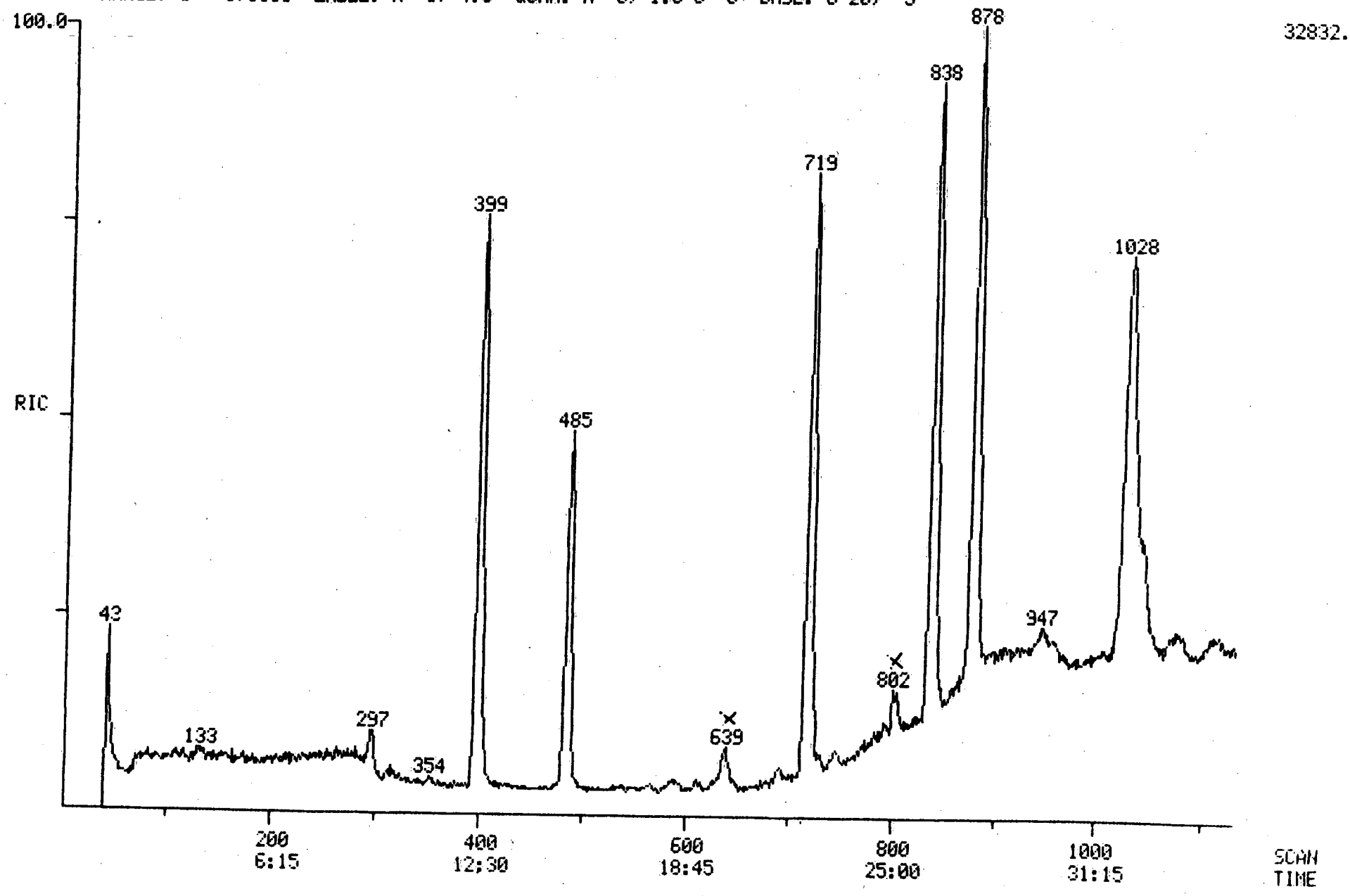
| INTERNAL STANDARD | SCAN # |
|---|---|
| **VOLATILE FRACTION** | |
| BROMOCHLOROMETHANE | 399 |
| 1,4-DIFLUOROBENZENE | 719 |
| CHLOROBENZENE-D5 | 878 |

| SEMI-VOLATILE FRACTION | SCAN # |
|---|---|
| 1,4-DICHLOROBENZENE-D4 | - |
| NAPTHALENE-D8 | - |
| ACENAPTHENE-D10 | - |
| PHENANTHRENE-D10 | - |
| CHRYSENE-D12 | - |
| PERYLENE-D12 | - |

MIDRIC
08/19/87 15:00:00
SAMPLE: GC/MS#1, 2033-1001 TB
CONDS.: 624
RANGE: G 1,1130 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: VOA5785 #1
CALI: VOA5785 #2

SCANS 1 TO 1130

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# SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Low Level X Medium Level _____

| FRACTION | COMPOUND | CONC. SPIKE ADDED (ug/Kg) | SAMPLE RESULT | CONC. MS | % REC | CONC. MSD | % REC | RPD | QC LIMITS * RPD | QC LIMITS * RECOVERY |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA SMO SAMPLE NO. 2033 6004 | 1,1-Dichloroethene | 50 | 0 | 38 | 76 | 47 | 94 | 10 | 22 | 59-172 |
| | Trichloroethene | 50 | 0 | 40 | 80 | 46 | 92 | 7 | 24 | 62-137 |
| | Chlorobenzene | 50 | 0 | 46 | 92 | 53 | 106 | 7 | 21 | 60-133 |
| | Toluene | 50 | 7 | 43 | 86 | 54 | 108 | 11 | 21 | 59-139 |
| | Benzene | 50 | 3 | 47 | 94 | 53 | 106 | 6 | 21 | 66-142 |
| B/N SMO SAMPLE NO. | 1,2,4-Trichlorobenzene | | | | | | | | 23 | 38-107 |
| | Acenaphthene | | | | | | | | 19 | 31-137 |
| | 2,4 Dinitrotoluene | | | | | | | | 47 | 28-89 |
| | Di-n-Butylphthalate | | | | | | | | 47 | 29-135 |
| | Pyrene | | | | | | | | 36 | 35-142 |
| | N-Nitrosodi-n-Propylamine | | | | | | | | 38 | 41-126 |
| | 1,4-Dichlorobenzene | | | | | | | | 27 | 28-104 |
| ACID SMO SAMPLE NO. | Pentachlorophenol | | | | | | | | 47 | 17-109 |
| | Phenol | | | | | | | | 35 | 26-90 |
| | 2-Chlorophenol | | | | | | | | 50 | 25-102 |
| | 4-Chloro-3-Methylphenol | | | | | | | | 33 | 26-103 |
| | 4-Nitrophenol | | | | | | | | 50 | 11-114 |
| PEST SMO SAMPLE NO. | Lindane | | | | | | | | 50 | 46-127 |
| | Heptachlor | | | | | | | | 31 | 35-130 |
| | Aldrin | | | | | | | | 43 | 34-132 |
| | Dieldrin | | | | | | | | 38 | 31-134 |
| | Endrin | | | | | | | | 45 | 42-139 |
| | 4,4'-DDT | | | | | | | | 50 | 23-134 |

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 0 out of 5 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

RECOVERY: VOAs 0 out of 10 : outside QC limits
B/N _____ out of _____ : outside QC limits
ACID _____ out of _____ : outside QC limits
PEST _____ out of _____ : outside QC limits

Comments: _____

# GC/MS TUNING AND MASS CALIBRATION

## Bromofluorobenzene (BFB)

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Instrument ID 5100 Date 8/19/87 Time 11:07 + 32:02

Lab ID VOA 5780 Data Release Authorized By: JEF

| m/e | ION ABUNDANCE CRITERIA | %RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of the base peak | 22.32 |
| 75 | 30.0 - 60.0% of the base peak | 43.55 |
| 95 | Base peak, 100% relative abundance | 100.00 |
| 96 | 5.0 - 9.0% of the base peak | 5.31 |
| 173 | Less than 1.0% of the base peak | <1 |
| 174 | Greater than 50.0% of the base peak | 67.30 |
| 175 | 5.0 - 9.0% of mass 174 | 5.23 (7.77)[1] |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 64.24 (95.4)[1] |
| 177 | 5.0 - 9.0% of mass 176 | 4.06 (6.3)[2] |

[1] Value in parenthesis is % mass 174.
[2] Value in parenthesis is % mass 176.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

| SAMPLE ID | LAB ID | DATE OF ANALYSIS | TIME OF ANALYSIS |
|---|---|---|---|
| BLK BFB STD | VOA 5780 | 8/19/87 | 11:07 |
| 20 ug/L VOA HSL STD | VOA 5781 | " | 11:52 |
| 100 ug/L VOA HSL STD | VOA 5782 | " | 12:38 |
| 200 ug/L VOA HSL STD | VOA 5783 | " | 13:24 |
| BLANK | VOA 5784 | " | 14:09 |
| 2033-1001 TB | VOA 5785 | " | 15:00 |
| 2033-1002 FB | VOA 5786 | " | 15:46 |
| 2033-6001 | VOA 5787 | " | 16:37 |
| 2033-6002 | VOA 5788 | " | 17:22 |
| N/A | VOA 5789 | " | N/A |
| BLANK | VOA 5790 | " | 19:00 |
| | | | |
| | | | |
| | | | |
| | | | |



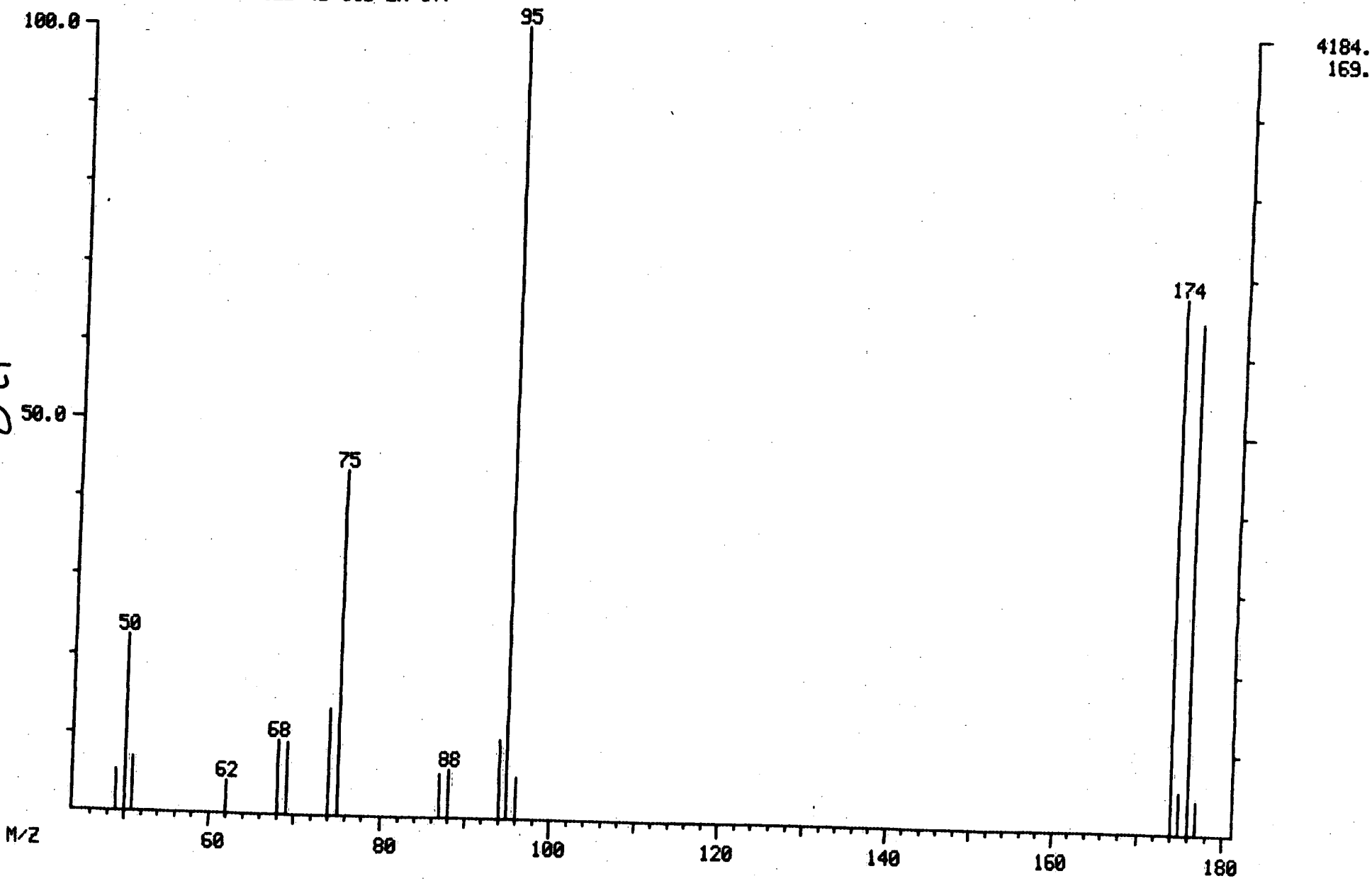
FORM V

4/84

MID MASS SPECTRUM
08/19/87 11:07:00 + 32:02
SAMPLE: GC/MS#1, BLK BFR STD.
CONDS.: 624
GC TEMP: 239 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: VOA5780 #1025
CALI: VOA5780 #2

BASE M/Z: 95
RIC: 19168.

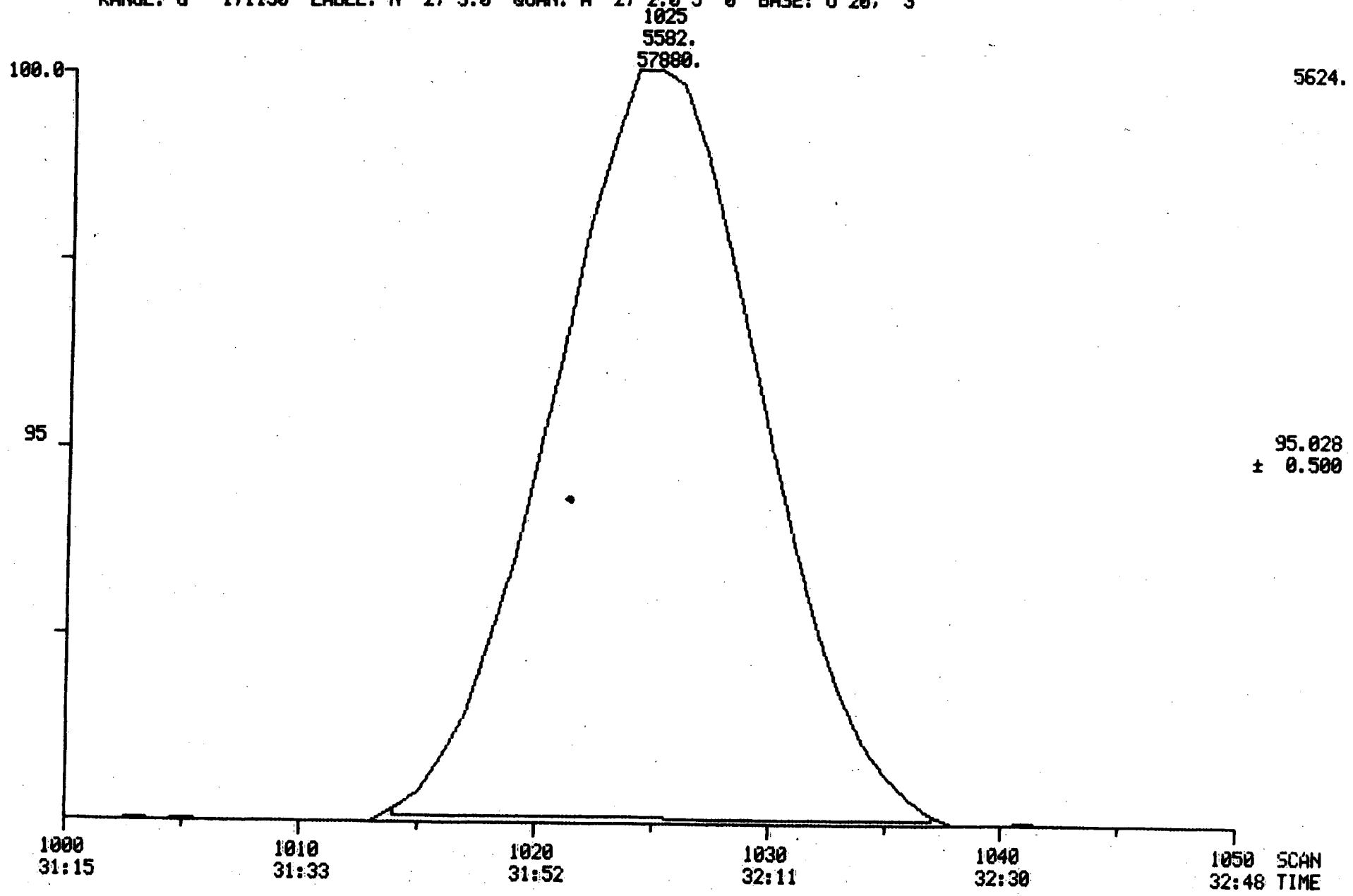



120

MIDMASS CHROMATOGRAM
08/19/87 11:07:00
SAMPLE: GC/MS#1, BLK BFR STD.
CONDS.: 624
RANGE: G 1,1130 LABEL: N 2, 3.0 QUAN: A 2, 2.0 J 0 BASE: U 20, 3

DATA: VOA5780 #1025
CALI: VOA5780 #2

SCANS 1000 TO 1050




121

# REAGENT BLANK SUMMARY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

| FILE ID | DATE OF ANALYSIS | FRACTION | MATRIX | CONC. LEVEL | INST. ID | CAS NUMBER | COMPOUND (NBS, TIC OR UNKNOWN) | CONC. | UNITS | CRQL |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA 5790 | 8/19/87 | VOA | WATER | Low | 5100 | N/A | Methylene Chloride | 5 | ug/L | 5 |

Comments:

FORM IV

4/84

# CHAIN OF CUSTODY RECORD

Log Book Pg. No. 9

Project Name/Number ORBIS P87-304 | Sample Date: 8-7-87

— See options below

| ETK Lab # Sample # | Sub | Field Sample No. A | B | Time | Sample Location | Sample Depth | Sample Type | No. of Containers | Section / Option: Metals A B C D | GC/MS Organics A B C D | Other Organics A B C D | Nutrients A B C D | S.D.W.A. | Solids | Bacty | TC/FC | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | P304 | 1001 | 8:30 | LAB | — | WATER | 1 | | C | | | | | | | |
| | | P304 | 1002 | 10:50 | FIELD | — | WATER | 6 | A | A | A | | | | | | |

| Metals -M- | GC/MS Organics -G- | Organics (Other) -Q- | Nutrients - Minerals -N- | S.D.W.A. Conven. Analysis -S- | Solid Series / pH Conductivity |
|---|---|---|---|---|---|
| "A" Priority Metals<br>As Sb Be Cd<br>Cr Cu Pb Hg<br>Ni Se Ag Tl<br>Zn | "A" P.P. + 40<br>VOAs + 15<br>A/BNs + 25<br>Pesticides & PCBs | "A" PHC<br>Petroleum Hydrocarbons | "A" Nutrients<br>Ammonia<br>Nitrate<br>Nitrite<br>Total Phosphorus<br>TKN | Primary:<br>$Fl^-$ Turb. $NO_3$-N<br>Secondary:<br>pH TDS Alk.<br>Hardness L.I. $SO_4$<br>$Cl^-$ $F^-$ M.B.A.S. | TS TDS<br>TSS TVDS<br>pH TVSS<br>Conductivity |
| "B" S.D.W.A.<br>Primary:<br>As Ba Cd Cr<br>Pb Na Hg Se Ag<br>Secondary:<br>Cu Fe Mn Zn | "B" P.P. — No Searches<br>VOAs<br>A/BNs<br>Pesticides & PCBs | "B" O & G<br>Oil & Grease | "B" Minerals<br>Alk. $Cl^-$<br>pH $F^-$<br>Hard. $SO_4$<br>L.I. Turb. | | |
| "C" Misc. Metals<br>Cr+6 Fe Mn<br>Na Ba K<br>Ca Mg | "C" VOAs only<br>A. Searches<br>B. No Searches<br>C. Specific: | "C" Total Phenols<br>Total Phenols | "C" Oxygen Demand<br>B.O.D. C.O.D.<br>A. Total<br>B. Soluable | | |
| "D" List (others) | "D" A-280<br>A-280 Parameters<br>S.D.W.A. | "D" Cyanide<br>Cyanide | "D" Misc. List | | |

| Bottles/Samplers Prepared by: | Date | Time |
|---|---|---|
| KBA | 8/6/87 | 1000 |
| **Sampled by:** | **Date** | **Time** |
| Kevin Hennessy | 8/7/87 | 1030 |
| **Received by:** | **Date** | **Time** |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| **Lab. Received by:** | **Date** | **Time** |
| J Sanderson | 8/7/87 | 1345 |

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2033

3 of 3

**Elson T. Killam Associates, Inc.**

27 Bleeker Street, P.O. Box 1008, Millburn, NJ 07041
Tel. 201/379-3400 Telex 642-057 Telecopier 201/376-1072

Environmental and Hydraulic Engineers

# ANALYTICAL DATA REPORT

**ORBIS PRODUCTS CORP.**

**NEWARK, NEW JERSEY**

**FIELD BLANK**

**PROJECT NUMBER:** P87-304

**LABORATORY REFERENCE NUMBER:** 2033-1002FB

**DATE AND TIME COLLECTED:** 8/7/87 10:30

Nancy J. Potak
LABORATORY DIRECTOR

SEPTEMBER 24, 1987

N.J. LABORATORY
CERTIFICATION NO.: 07059

Elson T. Killam Associates, Inc.

# LABORATORY CHRONICLE

| | |
|---|---|
| **LABORATORY SAMPLE NO.:** | 2033-1002FB |
| **RECEIVED:** | 8/7/87 |
| **ORGANICS:** | |
| **EXTRACTION:** | 8/14/87 |
| **ANALYSIS:** | |
| **1. VOLATILE COMPOUNDS:** | 8/19/87 |
| **2. ACID EXTRACTABLES:** | 8/26/87 |
| **3. BASE/NEUTRALS:** | 8/26/87 |
| **4. PESTICIDES/PCBs:** | 8/26/87 |

| **METALS:** | CONVENTIONAL | Se | Hg | As |
|---|---|---|---|---|
| **DIGESTION:** | 8/10/87 | 8/17/87 | 8/17/87 | 8/17/87 |
| **ANALYSES:** | 8/21-26/87 | 8/18/87 | 8/20/87 | 8/19/87 |

| **OTHER ANALYSES:** | **EXTRACTED:** | **ANALYSES:** |
|---|---|---|
| PHC | 8/10/87 | 8/14/87 |

**QUALITY CONTROL SUPERVISOR**
**REVIEW AND APPROVAL:** Nancy J. Pitt

# METHODOLOGY SUMMARY

**Purgeable Organics**

USEPA METHOD 624

**Acid Extractables**

USEPA METHOD 625

**Base/Neutral Extractables**

USEPA METHOD 625

**PESTICIDE EXTRACTABLES**

USEPA METHOD 625

**Metals**

SW 846 3050 (FLAME)
SW 846 7061 As (Hydride)
SW 846 7741 Se (Hydride)
SW 846 7471 Hg (Cold Vapor)

**Total Cyanide**

**Total Phenol**

**Other** PHC - USEPA 418.1 (Modified for soils)

# PETROLEUM HYDROCARBONS DATA

LABORATORY SAMPLE NO.: 2033-1002FB

| | CONCENTRATION DRY WEIGHT (mg/L) | DETECTION LIMIT (mg/L) |
|---|---|---|
| PETROLEUM HYDROCARBONS | BDL | .5 |

BDL = BELOW DETECTION LIMIT

## PETROLEUM HYDROCARBONS
## MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

**LAB REFERENCE ID NO.:** 2033-1002FB **QUALITY ASSURANCE SAMPLE:** 2033-6006

| LAB SAMPLE NO. | CONC. SPIKE ADDED | SAMPLE CONC. | CONC. MS | % REC | CONC. MSD | % REC | RPD |
|---|---|---|---|---|---|---|---|
| 2033-6006..... | 610 | <30 | 612 | 100 | 632 | 104 | 4 |

Concentration - mg/kg
RPD - relative percent difference

# METALS AND MISCELLANEOUS DATA

LABORATORY SAMPLE NO.: 2033-1002FB

| | CONCENTRATION (mg/L) | DETECTION LIMIT (mg/L) |
|---|---|---|
| ANTIMONY | 0.03 | 0.02 |
| ARSENIC | BDL | 0.005 |
| BERYLLIUM | BDL | 0.005 |
| CADMIUM | BDL | 0.002 |
| CHROMIUM | BDL | 0.005 |
| COPPER | BDL | 0.02 |
| LEAD | BDL | 0.005 |
| MERCURY | BDL | 0.002 |
| NICKEL | BDL | 0.02 |
| SELENIUM | BDL | 0.005 |
| SILVER | 0.02 | 0.01 |
| THALLIUM | BDL | 0.01 |
| ZINC | BDL | 0.005 |

BDL = BELOW DETECTION LIMIT

# METALS
## SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

**LAB SAMPLE NO.:** 2033-1002FB **QUALITY ASSURANCE SAMPLE NO.:** 2033-6004

| | CONC. SPIKE ADDED | SAMPLE CONC. | CONC. MS | % REC | CONC. MSD | % REC | RPD |
|---|---|---|---|---|---|---|---|
| Antimony..... | 50 | <10 | 24 | 48 | 24 | 48 | 0 |
| Arsenic..... | 0.50 | 6.4* | - | - | - | - | - |
| Beryllium..... | 20 | 2 | 21 | 104 | 19 | 97 | 7 |
| Cadmium..... | 20 | <1 | 23 | 117 | 22 | 111 | 5 |
| Chromium..... | 50 | 58 | 66 | 133 | 64 | 128 | 4 |
| Copper..... | 50 | 26 | 54 | 108 | 54 | 108 | 0 |
| Lead..... | 50 | 31 | 57 | 113 | 60 | 121 | 6 |
| Mercury..... | 0.40 | 0.2 | 0.36 | 90 | 0.38 | 95 | 5 |
| Nickel..... | 50 | 25 | 54 | 108 | 53 | 105 | 3 |
| Selenium..... | 0.50 | 0.6 | 0.34 | 69 | 0.42 | 83 | 18 |
| Silver..... | 50 | <5 | 52 | 105 | 52 | 103 | 2 |
| Thallium..... | 50 | <5 | 56 | 111 | 56 | 111 | 0 |
| Zinc..... | 20 | 213* | - | - | - | - | - |

Concentration - mg/kg
RPD - relative percent difference

* Sample concentration is too high for accurate spike recovery.

## DATA QUALIFIERS

The following four qualifiers are used in the analytical report package. They are equivalent to those issued by EPA - Contract Laboratory Program:

U - Indicates that the compound was analyzed for but not detected. All sample detection limits reported have been corrected for dilution and per cent moisture. No adjustements for blank contamination have been made.

J - Refers to an estimated value. This is used when the mass spectral data indicates the presence of a compound that meets the identification criteria, yet has a concentration less than the contract required detection limit. All estimated values reported have been adjusted for both dilution and per cent moisture, but no corrections have been made for possible blank contamination.

B - This flag is used to note that the compound was found to be present in the laboratory blank as well as in the sample. It indicates that the possibility of laboratory contamination exists.

The EPA has issued certain quidelines to aid in the evaluation of data when common laboratory artifacts occur. Blank contribution is considered to be negligable if it is ten times less than the concentration present in the sample. If the concentrations of the compounds found in both the sample and the blank are comparable (i.e. sample concentration is less than twice that of the blank), the occurance of the compound in the sample is considered to be suspect.

Up to 25 ppb of methylene chloride is permitted to be present in the blanks of volatile organic analyses.

C - Applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ul in the final extract are confirmed by GC/MS.

The next qualifier is also used in referencing the analytical results:

X - This flag indicates the presence of a compound which is often found as a common laboratory or field contaminant.

# VOLATILE COMPOUNDS DATA

LABORATORY SAMPLE NO.: 2033-1002FB DATA FILE NO.: VOA5786

| | CONCENTRATION (ug/L) | | SCAN | DETECTION LIMIT (ug/L) |
|---|---|---|---|---|
| ACROLEIN | | U | | 100. |
| ACRYLONITRILE | | U | | 100. |
| BENZENE | | U | | 5. |
| BROMOFORM | | U | | 5. |
| BROMOMETHANE | | U | | 10. |
| CARBON TETRACHLORIDE | | U | | 5. |
| CHLOROBENZENE | | U | | 5. |
| DIBROMOCHLOROMETHANE | | U | | 5. |
| CHLOROETHANE | | U | | 10. |
| 2-CHLORO ETHYL VINYL ETHER | | U | | 10. |
| CHLOROFORM | 32 | | 466 | 5. |
| CHLOROMETHANE | | U | | 10. |
| BROMODICHLOROMETHANE | 5 | | 561 | 5. |
| 1,1-DICHLOROETHANE | | U | | 5. |
| 1,2-DICHLOROETHANE | | U | | 5. |
| 1,1-DICHLOROETHENE | | U | | 5. |
| TRANS-1,2-DICHLOROETHENE | | U | | 5. |
| 1,2-DICHLOROPROPANE | | U | | 5. |
| CIS-1,3-DICHLOROPROPENE | | U | | 5. |
| TRANS-1,3-DICHLOROPROPENE | | U | | 5. |
| ETHYLBENZENE | | U | | 5. |
| METHYLENE CHLORIDE | 3 | JB | 298 | 5. |
| 1,1,2,2-TETRACHLOROETHANE | | U | | 5. |
| TETRACHLOROETHENE | | U | | 5. |
| TOLUENE | | U | | 5. |
| 1,1,1-TRICHLOROETHANE | | U | | 5. |
| 1,1,2-TRICHLOROETHANE | | U | | 5. |
| TRICHLOROETHENE | | U | | 5. |
| VINYL CHLORIDE | | U | | 10. |
| ACETONE - HSL | | U | | 10. |
| CARBON DISULFIDE - HSL | | U | | 5. |
| 2-HEXANONE - HSL | | U | | 10. |
| 2-BUTANONE | | U | | 10. |
| 4-METHYL-2-PENTANONE -HSL | | U | | 10. |
| STYRENE - HSL | | U | | 5. |
| TOTAL XYLENES - HSL | | U | | 5. |

# ACID EXTRACTABLE DATA

**LABORATORY SAMPLE NO.:** 2033-1002FB

| | CONCENTRATION dry weight (ug/L) | SCAN | DETECTION LIMIT (ug/L) |
|---|---|---|---|
| 2-CHLOROPHENOL | U | | 10 |
| 2,4-DICHLOROPHENOL | U | | 10 |
| 2,4-DIMETHLYPHENOL | U | | 10 |
| 4,6-DINITRO-2-METHYLPHENOL | U | | 50 |
| 2,4-DINITROPHENOL | U | | 50 |
| 2-NITROPHENOL | U | | 10 |
| 4-NITROPHENOL | U | | 50 |
| 4-CHLORO-3-METHYLPHENOL | U | | 10 |
| PENTACHLOROPHENOL | U | | 50 |
| PHENOL | U | | 10 |
| 2,4,6-TRICHLOROPHENOL | U | | 10 |

# BASE NEUTRAL EXTRACTABLE DATA

**LABORATORY SAMPLE NO.:** 2033-1002FB **DATA FILE NO.:** ABN2652

| | CONCENTRATION dry weight (ug/L) | SCAN | DETECTION LIMIT (ug/L) |
|---|---|---|---|
| ACENAPHTHENE | U | | 10 |
| ACENAPPHTHYLENE | U | | 10 |
| ANTHRACENE | U | | 10 |
| BENZIDINE | U | | 50 |
| BENZO (A) ANTHRACENE | U | | 10 |
| BENZO (A) PYRENE | U | | 10 |
| BENZO (B) FLUORANTHENE | U | | 10 |
| BENZO (G,H,I) PERYLENE | U | | 10 |
| BENZO (K) FLUORATHENE | U | | 10 |
| BIS (2-CHLOROETHOXY) METHANE | U | | 10 |
| BIS (2-CHLOROETHYL) ETHER | U | | 10 |
| BIS (2-CHLOROISOPROPYL) ETHER | U | | 10 |
| BIS (2-ETHYLHEXYL) PHTHALATE | U | | 10 |
| 4-BROMOPHENYL PHENYL ETHER | U | | 10 |
| BUTYLBENZYL PHTHALATE | U | | 10 |
| 2-CHLORONAPHTHALENE | U | | 10 |
| 4-CHLOROPHENYL PHENLY ETHER | U | | 10 |
| CHRYSENE | U | | 10 |
| DIBENZO (A,H) ANTHRACENE | U | | 10 |
| 1,2-DICHLOROBENZENE | U | | 10 |
| 1,3-DICHLOROBENZENE | U | | 10 |
| 1,4-DICHLOROBENZENE | U | | 10 |
| 3,3'-DICHLOROBENZIDINE | U | | 20 |
| DIETHYLPHTHALATE | U | | 10 |
| DIMETHYL PHTHALATE | U | | 10 |
| DI-N-BUTYL PHTHALATE | U | | 10 |
| 2,4-DINITROTOLUENE | U | | 10 |
| 2,6-DINITROTOLUENE | U | | 10 |
| DI-N-OCTYL PHTHALATE | U | | 10 |
| 1,2-DIPHENYLHYDRAZINE | U | | 10 |
| FLOURANTHENE | U | | 10 |
| FLOURENE | U | | 10 |
| HEXACHLOROBUTADIENE | U | | 10 |
| HEXACHLOROCYCLOPENTADIENE | U | | 10 |
| HEXACHLOROBENZENE | U | | 10 |
| HEXCHLOROETHANE | U | | 10 |
| INDENO (1,2,3-CD) PYRENE | U | | 10 |
| ISOPHORONE | U | | 10 |
| NAPHTHALENE | U | | 10 |
| NITROBENZENE | U | | 10 |
| N-NITROSODIMETHYLAMINE | U | | 10 |
| N-NITROSODI-N-PROPYLAMINE | U | | 10 |
| N-NITROSODIPHENYLAMINE | U | | 10 |
| PHENANTHRENE | U | | 10 |
| PYRENE | U | | 10 |
| 1,2,4-TRICHLOROBENZENE | U | | 10 |

# PESTICIDES/PCBs DATA

LABORATORY SAMPLE NO.: 2033-1002FB DATA FILE NO.: ABN2652

| | CONCENTRATION dry weight (ug/L) | SCAN | DETECTION LIMIT (ug/L) |
|---|---|---|---|
| ALDRIN | U | | 10 |
| ALPHA-BHC | U | | 10 |
| BETA-BHC | U | | 10 |
| GAMMA-BHC | U | | 10 |
| DELTA-BHC | U | | 10 |
| CHLORDANE | U | | 10 |
| 4,4'-DDT | U | | 10 |
| 4,4'-DDE | U | | 10 |
| 4,4'-DDD | U | | 10 |
| DIELDRIN | U | | 10 |
| ALPHA-ENDOSULFAN | U | | 10 |
| BETA-ENDOSULFAN | U | | 10 |
| ENDOSULFAN SULFATE | U | | 10 |
| ENDRIN | U | | 10 |
| ENDRIN ALDEHYDE | U | | 10 |
| HEPTACHLOR | U | | 10 |
| HEPTACHLOR EPOXIDE | U | | 10 |
| PCB-1016 | U | | 10 |
| PCB-1221 | U | | 10 |
| PCB-1232 | U | | 10 |
| PCB-1242 | U | | 10 |
| PCB-1248 | U | | 10 |
| PCB-1254 | U | | 10 |
| PCB-1260 | U | | 10 |
| TOXAPHENE | U | | 10 |

Laboratory Name: E.T. Killam Assoc.

Case No

| Sample Number |
|---|
| 2033 1002 FB |

## Organics Analysis Data Sheet
(Page 4)

### Tentatively Identified Compounds

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. | No Compounds Found | VOA | | |
| 2. | | | | |
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Laboratory Name E.T. Killam Assoc.

Case No

| Sample Number |
|---|
| 2033-1002FB |

## Organics Analysis Data Sheet
(Page 4)

### Tentatively Identified Compounds

| CAS Number | Compound Name | Fraction | RT or Scan Number | Estimated Concentration (ug/l or ug/kg) |
|---|---|---|---|---|
| 1. | No Compounds Found | ABN | | |
| 2. | | | | |
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| 30. | | | | |

# METHOD PERFORMANCE DATA

## WATER SURROGATE PERCENT RECOVERY

LABORATORY SAMPLE NO.: 2033-1002FB

| COMPOUND | RECOVERY | EPA CONTROL LIMITS | SCAN # |
|---|---|---|---|
| **VOLATILE FRACTION** | | | |
| TOLUENE - D8 | 96 | 88-110 | 838 |
| BROMOFLUOROBENZENE | 100 | 86-115 | 1029 |
| 1,2-DICHLOROETHANE | 84 | 76-114 | 486 |
| **SEMI-VOLATILE FRACTION** | | | |
| NITROBENZENE-D5 | 70 | 35-114 | 1003 |
| 2-FLUOROBIPHENYL | 87 | 43-110 | 1381 |
| TERPHENYL-D14 | 105 | 33-141 | 2178 |
| PHENOL-D5 | 25 | 10-94 | 845 |
| 2-FLUOROPHENOL | 47 | 21-100 | 656 |
| 2,4,6-TRIBROMOPHENOL | 45 | 10-123 | 1689 |
| **PESTICIDE** | | | |
| DIBUTYL CHLORENDATE | 86 | 24-156** | 2454 |

*VALUES ARE OUTSIDE QC LIMITS
**ADVISORY LIMITS ONLY

# INTERNAL STANDARD SCAN LIST
## (RETENTION TIME)

LABORATORY SAMPLE NO.: 2033-1002FB

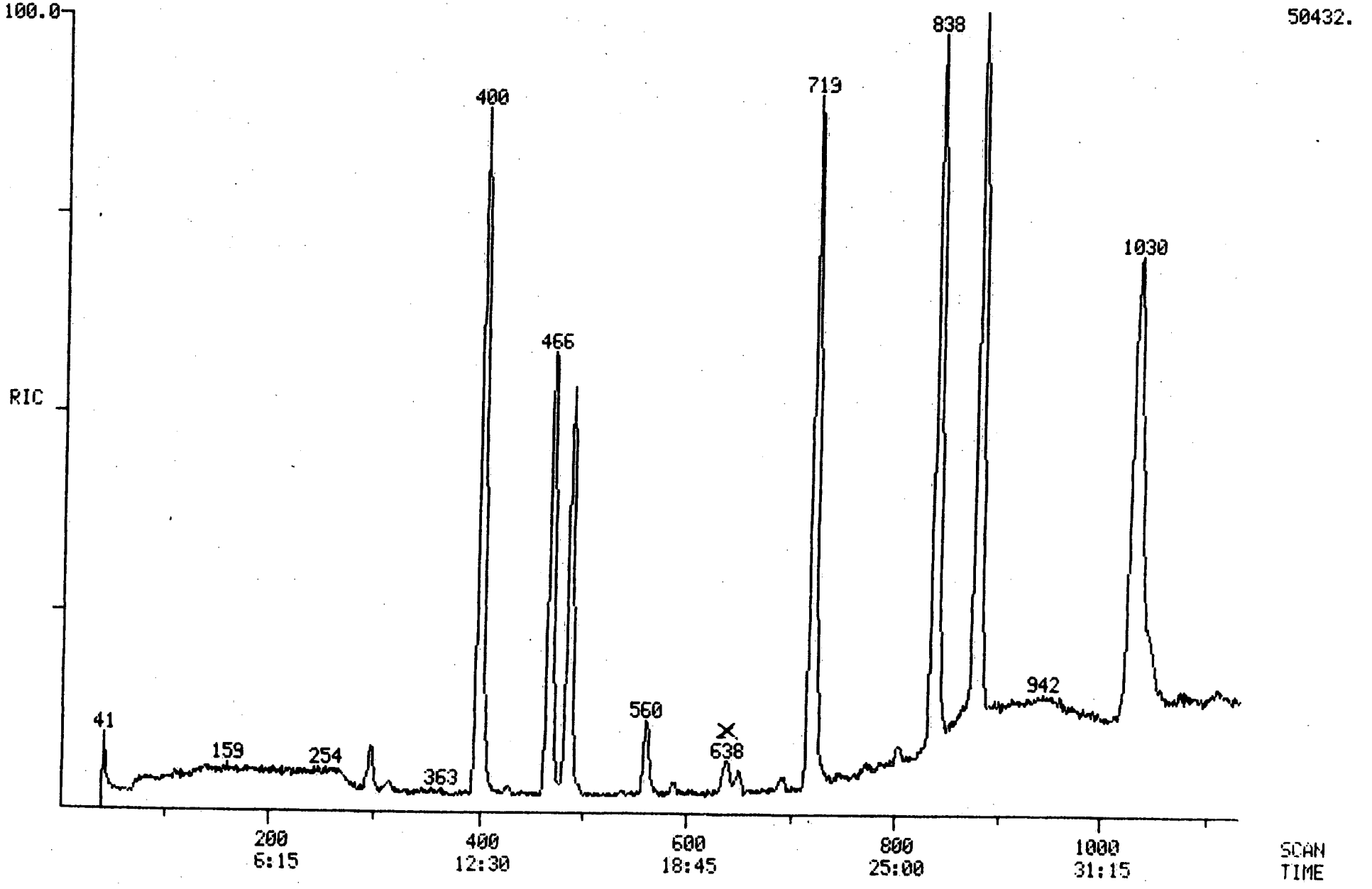
| INTERNAL STANDARD | SCAN # |
|---|---|
| **VOLATILE FRACTION** | |
| BROMOCHLOROMETHANE | 400 |
| 1,4-DIFLUOROBENZENE | 719 |
| CHLOROBENZENE-D5 | 878 |

| SEMI-VOLATILE FRACTION | SCAN # |
|---|---|
| 1,4-DICHLOROBENZENE-D4 | 884 |
| NAPTHALENE-D8 | 1144 |
| ACENAPTHENE-D10 | 1516 |
| PHENANTHRENE-D10 | 1827 |
| CHRYSENE-D12 | 2397 |
| PERYLENE-D12 | 2806 |

MIDRIC
08/19/87 15:46:00
SAMPLE: GC/MS#1, 2033-1002 FB
CONDS.: 624
RANGE: G 1,1130 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: VOA5786 #1
CALI: VOA5786 #2

SCANS 1 TO 1130

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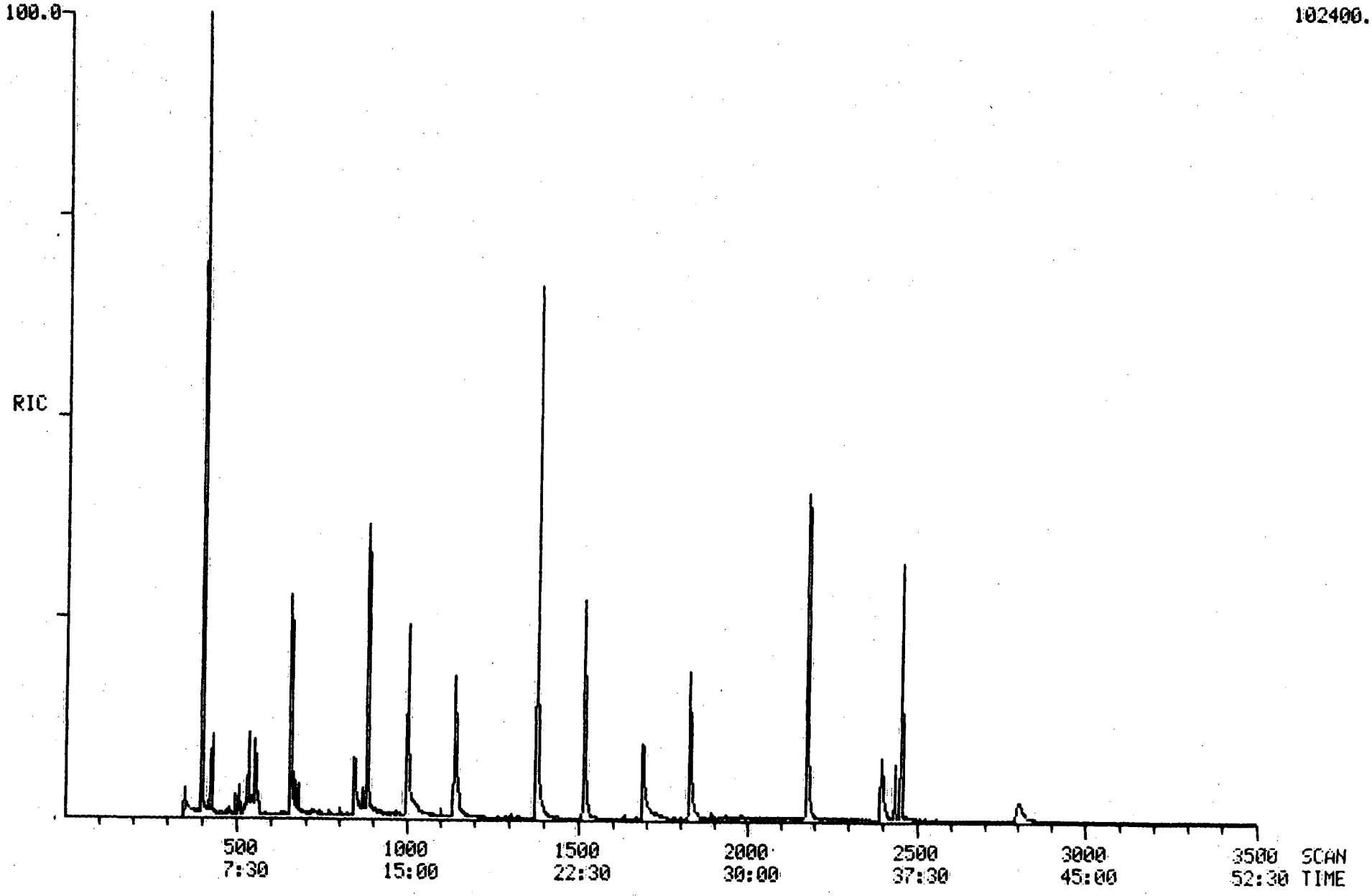
MIDRIC
08/26/87 20:19:00
SAMPLE: 2033-1002
CONDS.: 625
RANGE: G 1,3500 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: ABN2652 #1
CALI: ABN2652 #2

SCANS 1 TO 3500




141

# SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Low Level X Medium Level _____

| FRACTION | COMPOUND | CONC. SPIKE ADDED (ug/Kg) | SAMPLE RESULT | CONC. MS | % REC | CONC. MSD | % REC | RPD | QC LIMITS* RPD | QC LIMITS* RECOVERY |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA SMO SAMPLE NO. 2033 6004 | 1,1-Dicholorethene | 50 | 0 | 38 | 76 | 47 | 94 | 10 | 22 | 59-172 |
| | Trichloroethene | 50 | 0 | 40 | 80 | 46 | 92 | 7 | 24 | 62-137 |
| | Chlorobenzene | 50 | 0 | 46 | 92 | 53 | 106 | 7 | 21 | 60-133 |
| | Toluene | 50 | 7 | 43 | 86 | 54 | 108 | 11 | 21 | 59-139 |
| | Benzene | 50 | 3 | 47 | 94 | 53 | 106 | 6 | 21 | 66-142 |
| B/N SMO SAMPLE NO. | 1,2,4-Trichlorobenzene | | | | | | | | 23 | 38-107 |
| | Acenaphthene | | | | | | | | 19 | 31-137 |
| | 2,4 Dinitrotoluene | | | | | | | | 47 | 28-89 |
| | Di-n-Butylphthalate | | | | | | | | 47 | 29-135 |
| | Pyrene | | | | | | | | 36 | 35-142 |
| | N-Nitrosodi-n-Propylamine | | | | | | | | 38 | 41-126 |
| | 1,4-Dichlorobenzene | | | | | | | | 27 | 28-104 |
| ACID SMO SAMPLE NO. | Pentachlorophenol | | | | | | | | 47 | 17-109 |
| | Phenol | | | | | | | | 35 | 26-90 |
| | 2-Chlorophenol | | | | | | | | 50 | 25-102 |
| | 4-Chloro-3-Methylphenol | | | | | | | | 33 | 26-103 |
| | 4-Nitrophenol | | | | | | | | 50 | 11-114 |
| PEST SMO SAMPLE NO. | Lindane | | | | | | | | 50 | 46-127 |
| | Heptachlor | | | | | | | | 31 | 35-130 |
| | Aldrin | | | | | | | | 43 | 34-132 |
| | Dieldrin | | | | | | | | 38 | 31-134 |
| | Endrin | | | | | | | | 45 | 42-139 |
| | 4,4'-DDT | | | | | | | | 50 | 23-134 |

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 0 out of 5 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

RECOVERY: VOAs 0 out of 10 : outside QC limits
B/N _____ out of _____ : outside QC limits
ACID _____ out of _____ : outside QC limits
PEST _____ out of _____ : outside QC limits

Comments: _____



142

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Low Level _____ Medium Level _____

| FRACTION | COMPOUND | CONC. SPIKE ADDED (ug/Kg) | SAMPLE RESULT | CONC. MS | % REC | CONC. MSD | % REC | RPD | QC LIMITS* RPD | QC LIMITS* RECOVERY |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA SMO SAMPLE NO. | 1,1-Dichloroethene | | | | | | | | 22 | 59-172 |
| | Trichloroethene | | | | | | | | 24 | 62-137 |
| | Chlorobenzene | | | | | | | | 21 | 60-133 |
| | Toluene | | | | | | | | 21 | 59-139 |
| | Benzene | | | | | | | | 21 | 66-142 |
| B/N SMO SAMPLE NO. | 1,2,4-Trichlorobenzene | 100 | 0 | 71 | 71 | 67 | 67 | 3 | 23 | 38-107 |
| | Acenaphthene | 100 | 0 | 73 | 73 | 74 | 74 | 1 | 19 | 31-137 |
| | 2,4 Dinitrotoluene | 100 | 0 | 69 | 69 | 72 | 72 | 2 | 47 | 28-89 |
| | Di-n-Butylphthalate | 100 | 4 | 97 | 97 | 100 | 100 | 2 | 47 | 29-135 |
| | Pyrene | 100 | 1 | 79 | 79 | 88 | 88 | 5 | 36 | 35-142 |
| | N-Nitrosodi-n-Propylamine | 100 | 0 | 26 | 26* | 27 | 27* | 2 | 38 | 41-126 |
| 2033-6006 | 1,4-Dichlorobenzene | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 27 | 28-104 |
| ACID SMO SAMPLE NO. | Pentachlorophenol | 100 | 0 | 97 | 97 | 97 | 97 | 0 | 47 | 17-109 |
| | Phenol | 100 | 0 | 40 | 40 | 41 | 41 | 1 | 35 | 26-90 |
| | 2-Chlorophenol | 100 | 0 | 27 | 27 | 26 | 26 | 2 | 50 | 25-102 |
| | 4-Chloro-3-Methylphenol | 100 | 0 | 68 | 68 | 78 | 78 | 7 | 33 | 26-103 |
| 2033-6006 | 4-Nitrophenol | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 50 | 11-114 |
| PEST SMO SAMPLE NO. | Lindane | 100 | 0 | 78 | 78 | 88 | 88 | 6 | 50 | 46-127 |
| | Heptachlor | 100 | 0 | 82 | 82 | 90 | 90 | 5 | 31 | 35-130 |
| | Aldrin | 100 | 0 | 78 | 78 | 81 | 81 | 2 | 43 | 34-132 |
| | Dieldrin | 100 | 0 | 74 | 74 | 78 | 78 | 3 | 38 | 31-134 |
| | Endrin | 100 | 0 | 78 | 78 | 84 | 84 | 4 | 45 | 42-139 |
| 2033-6006 | 4,4'-DDT | 100 | 0 | 51 | 51 | 56 | 56 | 5 | 50 | 23-134 |

*ASTERISKED VALUES ARE OUTSIDE QC LIMITS.

RPD: VOAs 0 out of 16 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

RECOVERY: VOAs 2 out of 32 ; outside QC limits
B/N _____ out of _____ ; outside QC limits
ACID _____ out of _____ ; outside QC limits
PEST _____ out of _____ ; outside QC limits

Comments: 4-Nitrophenol & 1,4-Dichlorobenzene not added to spike solution.

# GC/MS TUNING AND MASS CALIBRATION

## Bromofluorobenzene (BFB)

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Instrument ID 5100 Date 8/19/87 Time 11:07 + 32:02

Lab ID VOA 5780 Data Release Authorized By: JEF

| m/e | ION ABUNDANCE CRITERIA | %RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of the base peak | 22.32 |
| 75 | 30.0 - 60.0% of the base peak | 43.55 |
| 95 | Base peak, 100% relative abundance | 100.00 |
| 96 | 5.0 - 9.0% of the base peak | 5.31 |
| 173 | Less than 1.0% of the base peak | <1 |
| 174 | Greater than 50.0% of the base peak | 67.30 |
| 175 | 5.0 - 9.0% of mass 174 | 5.23 (7.77)[1] |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 64.24 (95.4)[1] |
| 177 | 5.0 - 9.0% of mass 176 | 4.06 (6.3)[2] |

[1] Value in parenthesis is % mass 174.
[2] Value in parenthesis is % mass 176.

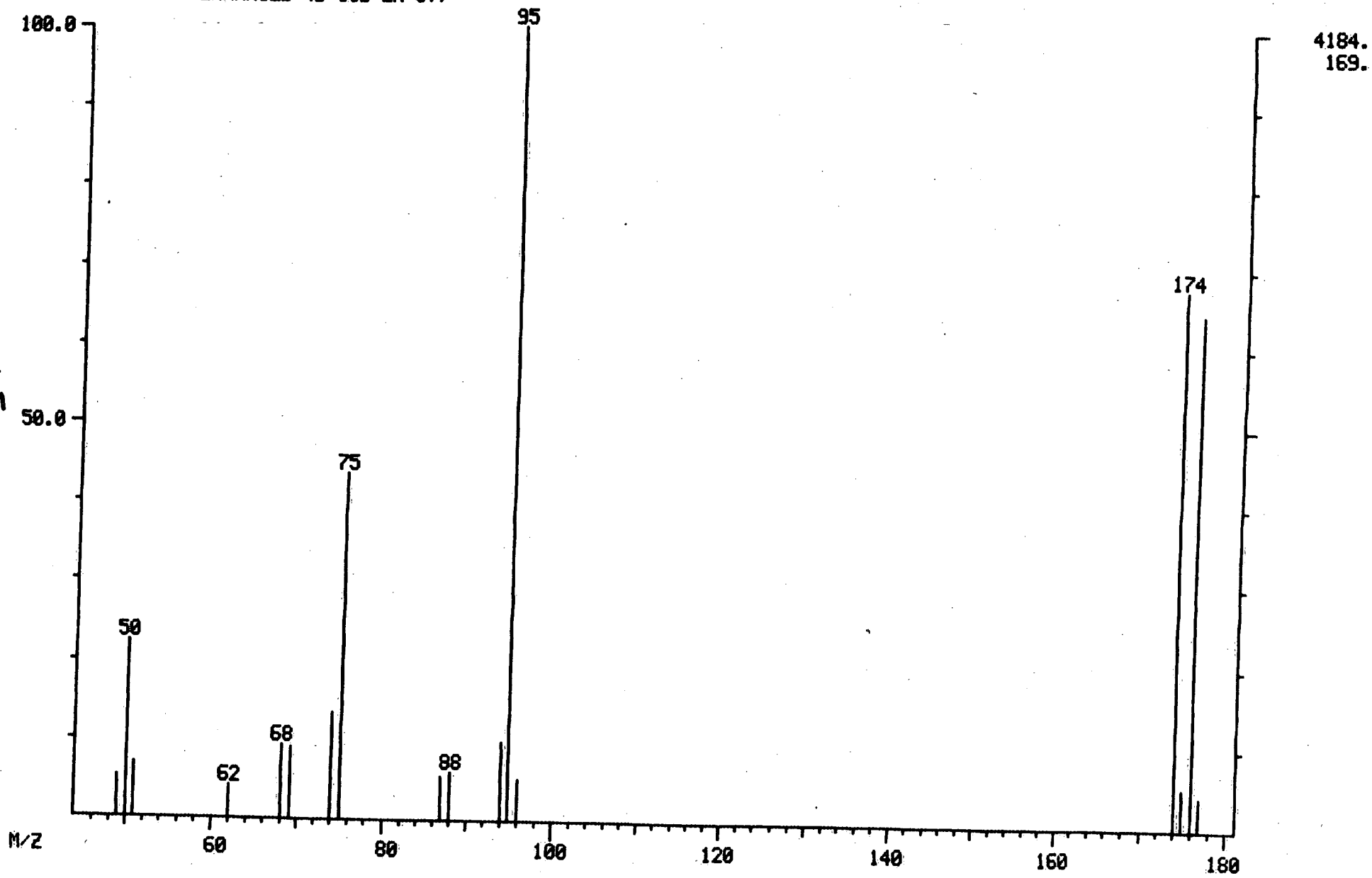
THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

| SAMPLE ID | LAB ID | DATE OF ANALYSIS | TIME OF ANALYSIS |
|---|---|---|---|
| BLK BFB STD | VOA 5780 | 8/19/87 | 11:07 |
| 20 ug/L VOA HSL STD | VOA 5781 | " | 11:52 |
| 100 ug/L VOA HSL STD | VOA 5782 | " | 12:38 |
| 200 ug/L VOA HSL STD | VOA 5783 | " | 13:24 |
| BLANK | VOA 5784 | " | 14:09 |
| 2033-1001 TB | VOA 5785 | " | 15:00 |
| 2033-1002 FB | VOA 5786 | " | 15:46 |
| 2033-6001 | VOA 5787 | " | 16:37 |
| 2033-6002 | VOA 5788 | " | 17:22 |
| N/A | VOA 5789 | " | N/A |
| BLANK | VOA 5790 | " | 19:00 |
| | | | |
| | | | |
| | | | |
| | | | |

MID MASS SPECTRUM
08/19/87 11:07:00 + 32:02
SAMPLE: GC/MS#1, BLK BFR STD.
CONDS.: 624
GC TEMP: 239 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: VOA5780 #1025
CALI: VOA5780 #2

BASE M/Z: 95
RIC: 19168.

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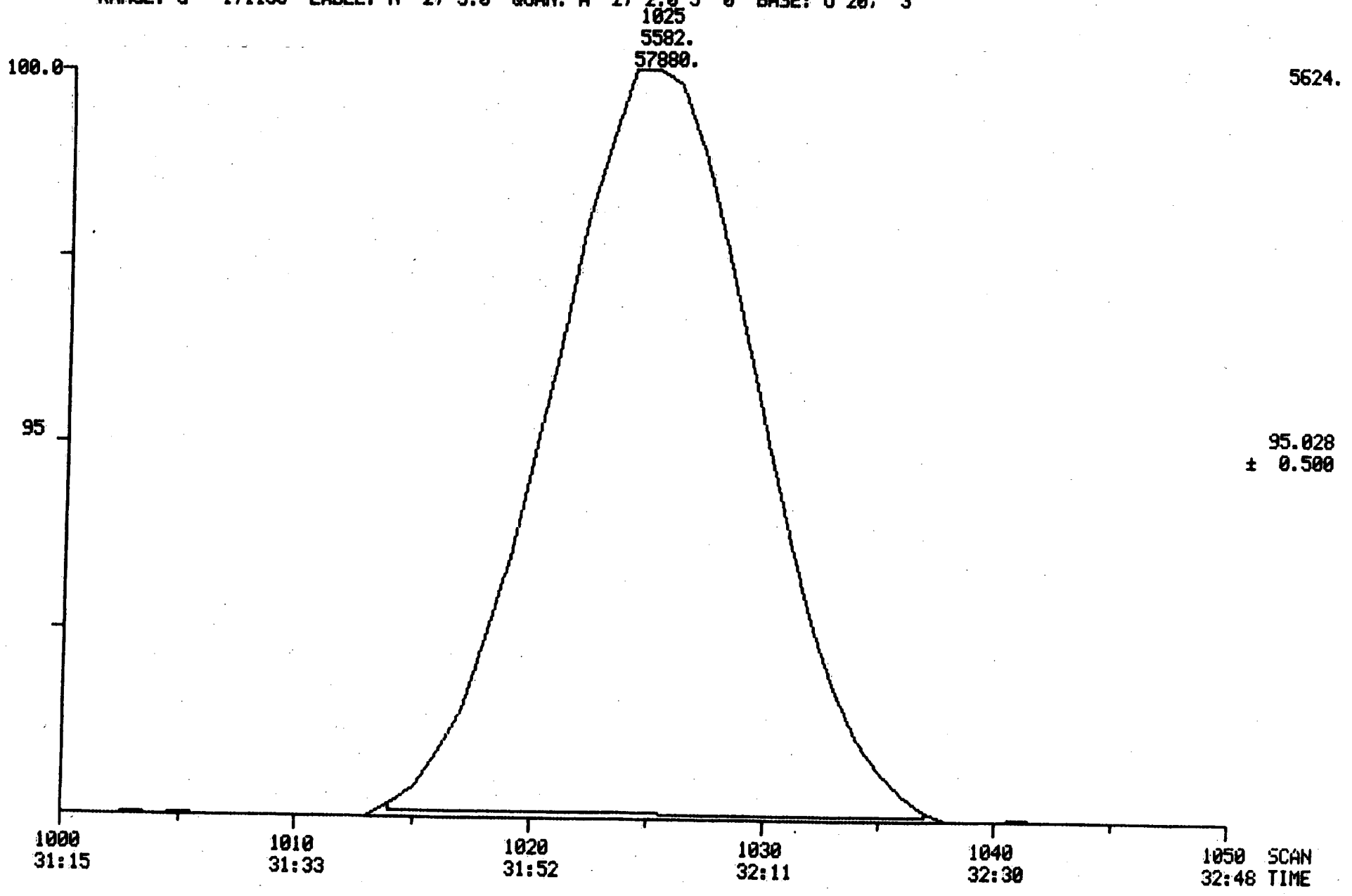
MIDMASS CHROMATOGRAM
08/19/87 11:07:00
SAMPLE: GC/MS#1, BLK BFR STD.
CONDS.: 624
RANGE: G 1,1130 LABEL: N 2, 3.0 QUAN: A 2, 2.0 J 0 BASE: U 20, 3

DATA: VOA5780 #1025
CALI: VOA5780 #2

SCANS 1000 TO 1050

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# REAGENT BLANK SUMMARY

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

| FILE ID | DATE OF ANALYSIS | FRACTION | MATRIX | CONC. LEVEL | INST. ID | CAS NUMBER | COMPOUND (HCL, TIC OR UNKNOWN) | CONC. | UNITS | CRQL |
|---|---|---|---|---|---|---|---|---|---|---|
| VOA 5790 | 8/19/87 | VOA | WATER | Low | 5100 | N/A | Methylene Chloride | 5 | ug/L | 5 |

Comments:

FORM IV

4/84

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# REAGENT BLANK SUMMARY

Case No. _____ Contractor _____ Contract No. _____

| FILE ID | DATE OF ANALYSIS | FRACTION | MATRIX | CONC. LEVEL | INST. ID | CAS NUMBER | COMPOUND (HSL, TIC OR UNKNOWN) | CONC. | UNITS | CRDL |
|---|---|---|---|---|---|---|---|---|---|---|
| ABN 2653 | 8/26/87 | ABN | Water | [illegible] | 5/[illegible] | N/A | NONE | | | |
| | | | | | | | | | | |
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Comments:

FORM IV

4/84

# CHAIN OF CUSTODY RECORD

Log Book Pg. No. 9

Project Name/Number ORBIS P87-304 | Sample Date: 8-7-87

| ETK Lab # Sample # | Sub | Field Sample No. A | Field Sample No. B | Time | Sample Location | Sample Depth | Sample Type | No. of Containers | Metals (Section / Option A B C D) | GC/MS Organics (A B C D) | Other Organics (A B C D) | Nutrients (A B C D) | S.D.W.A. | Solids | Bacty | TC/FC | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | P304 | 1001 | 8:30 | LAB | — | WATER | 1 | | C | | | | | | | |
| | | P304 | 1002 | 10:30 | FIELD | — | WATER | 6 | A | A | A | | | | | | |

— See options below

| Metals -M- | GC/MS Organics -G- | Organics (Other) -Q- | Nutrients - Minerals -N- | S.D.W.A. Conven. Analysis -S- | Solid Series / pH Conductivity |
|---|---|---|---|---|---|
| "A" Priority Metals: As Sb Be Cd Cr Cu Pb Hg Ni Se Ag Tl Zn | "A" P.P. + 40: VOAs + 15; A/BNs + 25; Pesticides & PCBs | "A" PHC: Petroleum Hydrocarbons | "A" Nutrients: Ammonia; Nitrate; Nitrite; Total Phosphorus; TKN | Primary: Fl⁻ Turb. $NO_3$-N; Secondary: pH TDS Alk. Hardness L.I. $SO_4$ Cl⁻ F⁻ M.B.A.S. | TS TDS TSS TVDS pH TVSS Conductivity |
| "B" S.D.W.A.: Primary: As Ba Cd Cr Pb Na Hg Se Ag; Secondary: Cu Fe Mn Zn | "B" P.P. — No Searches: VOAs; A/BNs; Pesticides & PCBs | "B" O & G: Oil & Grease | "B" Minerals: Alk. Cl⁻ pH F⁻ Hard. $SO_4$ L.I. Turb. | | |
| "C" Misc. Metals: Cr+6 Fe Mn Na Ba K Ca Mg | "C" VOAs only: A. Searches; B. No Searches; C. Specific: ____ | "C" Total Phenols: Total Phenols | "C" Oxygen Demand: B.O.D. C.O.D.; A. Total; B. Soluable | | |
| "D" List (others): ____ ____ ____ | "D" A-280: A-280 Parameters; S.D.W.A. | "D" Cyanide: Cyanide | "D" Misc. List: ____ ____ | | |

| Bottles/Samplers Prepared by: | Date | Time |
|---|---|---|
| [signature] | 8/6/87 | 1000 |
| **Sampled by:** | **Date** | **Time** |
| Kevin Hunsty | 8/7/87 | 1030 |
| **Received by:** | **Date** | **Time** |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| **Lab. Received by:** | **Date** | **Time** |
| [signature] | 8/7/87 | 1345 |

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2033

3 of 3

# GC/MS TUNING AND MASS CALIBRATION
## Decafluorotriphenylphosphine (DFTPP)

Case No. _____ Contractor E.T. Killam Assoc. Contract No. _____

Instrument ID 5100 Date 8/26/87 Time 18:38

Lab ID DFTPP355 Data Release Authorized By: JEC

| m/e | ION ABUNDANCE CRITERIA | %RELATIVE ABUNDANCE |
|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 36.35 |
| 68 | less than 2.0% of mass 69 | 0.47 (1.0y)[1] |
| 69 | mass 69 relative abundance | 45.68 |
| 70 | less than 2.0% of mass 69 | 0 (0)[1] |
| 127 | 40.0 - 60.0% of mass 198 | 42.30 |
| 197 | less than 1.0% of mass 198 | 0 |
| 198 | base peak, 100% relative abundance | 100.00 |
| 199 | 5.0 - 9.0% of mass 198 | 6.49 |
| 275 | 10.0 - 30.0% of mass 198 | 20.88 |
| 365 | greater than 1.00% of mass 198 | 3.72 |
| 441 | present, but less than mass 443 | 11.28 |
| 442 | greater than 40.0% of mass 198 | 73.24 |
| 443 | 17.0 - 23.0% of mass 442 | 16.76 (22.88)[2] |

[1] Value in parenthesis is % mass 69.
[2] Value in parenthesis is % mass 442.

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

| SAMPLE ID | | LAB ID | DATE OF ANALYSIS | TIME OF ANALYSIS |
|---|---|---|---|---|
| 50 ng/ML ABN HSL-PEST. STD. | | ABN 2651 | 8/26/87 | 19:10 |
| 2033-1002 | | ABN 2652 | " | 20:19 |
| BLANK-water (2033) | 8/14 | ABN 2653 | " | 21:28 |
| 2071-1202 | | ABN 2654 | " | 22:37 |
| 2071-2201 | | ABN 2655 | " | 23:46 |
| 2071-2202 | | ABN 2656 | 8/27/87 | 0:55 |
| 2071-2203 | | ABN 2657 | " | 2:04 |
| 2071-2204 | | ABN 2658 | " | 3:13 |
| 2071-2205 | | ABN 2659 | " | 4:22 |
| BLANK-water (2071) | 8/21 | ABN 2660 | " | 5:30 |
| 2062-1002 | | ABN 2661 | " | 6:39 |
| BLANK-water (2062) | 8/18 | ABN 2662 | " | 7:48 |
| | | | | |
| | | | | |
| | | | | |

MID Mass List
08/26/87 18:38:00 + 8:10
Sample: 50 NG DFTPP
Conds.: 625
Enhanced (S 15B 2N OT)

Data: DFTPP355 # 544
Cali: DFTPP355 # 2

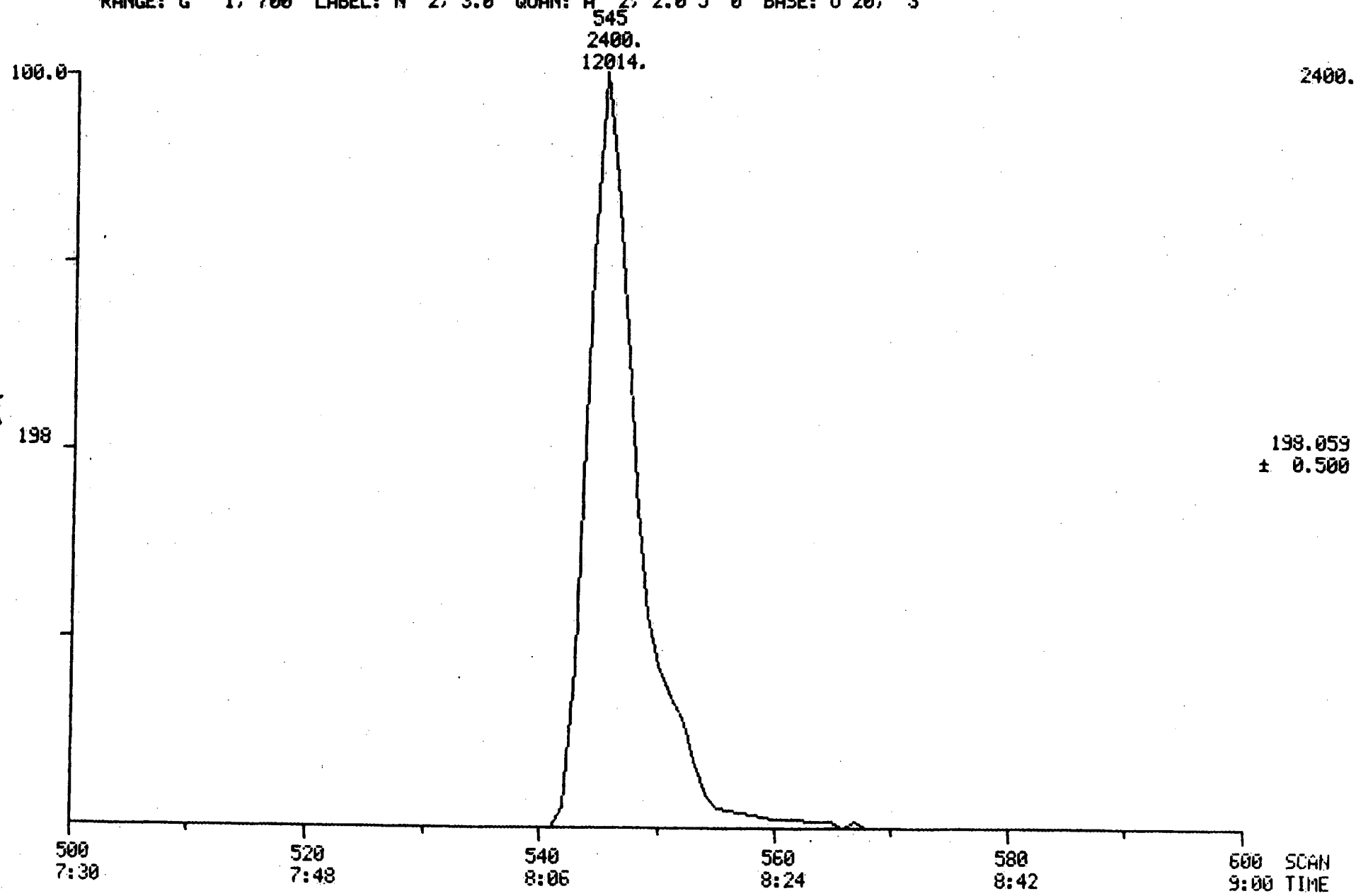
Base m/z: 198
RIC: 12480.

51 3.70 0.00 0. Minima Min inten: 55.
443 # 0 Maxima

| Mass | % RA | % RIC | Inten. |
|---|---|---|---|
| 51.00 | 36.35 | 4.31 | 538. |
| 69.00 | 45.68 | 5.42 | 676. |
| 74.00 | 4.05 | 0.48 | 60. |
| 75.00 | 6.42 | 0.76 | 95. |
| 77.00 | 37.97 | 4.50 | 562. |
| 93.00 | 4.46 | 0.53 | 66. |
| 98.00 | 4.05 | 0.48 | 60. |
| 99.00 | 4.05 | 0.48 | 60. |
| 107.00 | 14.26 | 1.69 | 211. |
| 110.00 | 25.54 | 3.03 | 378. |
| 111.00 | 3.99 | 0.47 | 59. |
| 117.00 | 8.85 | 1.05 | 131. |
| 127.00 | 42.30 | 5.02 | 626. |
| 129.00 | 18.99 | 2.25 | 281. |
| 167.00 | 4.59 | 0.54 | 68. |
| 179.00 | 3.92 | 0.46 | 58. |
| 186.00 | 14.19 | 1.68 | 210. |
| 187.00 | 4.26 | 0.50 | 63. |
| 198.00 | 100.00 | 11.86 | 1480. |
| 199.00 | 6.49 | 0.77 | 96. |
| 204.00 | 3.72 | 0.44 | 55. |
| 205.00 | 5.41 | 0.64 | 80. |
| 206.00 | 21.62 | 2.56 | 320. |
| 217.00 | 7.50 | 0.89 | 111. |
| 221.00 | 4.46 | 0.53 | 66. |
| 224.00 | 11.22 | 1.33 | 166. |
| 227.00 | 5.88 | 0.70 | 87. |
| 244.00 | 8.51 | 1.01 | 126. |
| 255.00 | 45.88 | 5.44 | 679. |
| 256.00 | 6.76 | 0.80 | 100. |
| 258.00 | 4.12 | 0.49 | 61. |
| 274.00 | 4.26 | 0.50 | 63. |
| 275.00 | 20.88 | 2.48 | 309. |
| 296.00 | 5.61 | 0.67 | 83. |
| 365.00 | 3.72 | 0.44 | 55. |
| 423.00 | 6.15 | 0.73 | 91. |
| 441.00 | 11.28 | 1.34 | 167. |
| 442.00 | 73.24 | 8.69 | 1084. |
| 443.00 | 16.76 | 1.99 | 248. |

MIDMASS CHROMATOGRAM
08/26/87 18:38:00
SAMPLE: 50 NG DFTPP
CONDS.: 625
RANGE: G 1, 700 LABEL: N 2, 3.0 QUAN: A 2, 2.0 J 0 BASE: U 20, 3

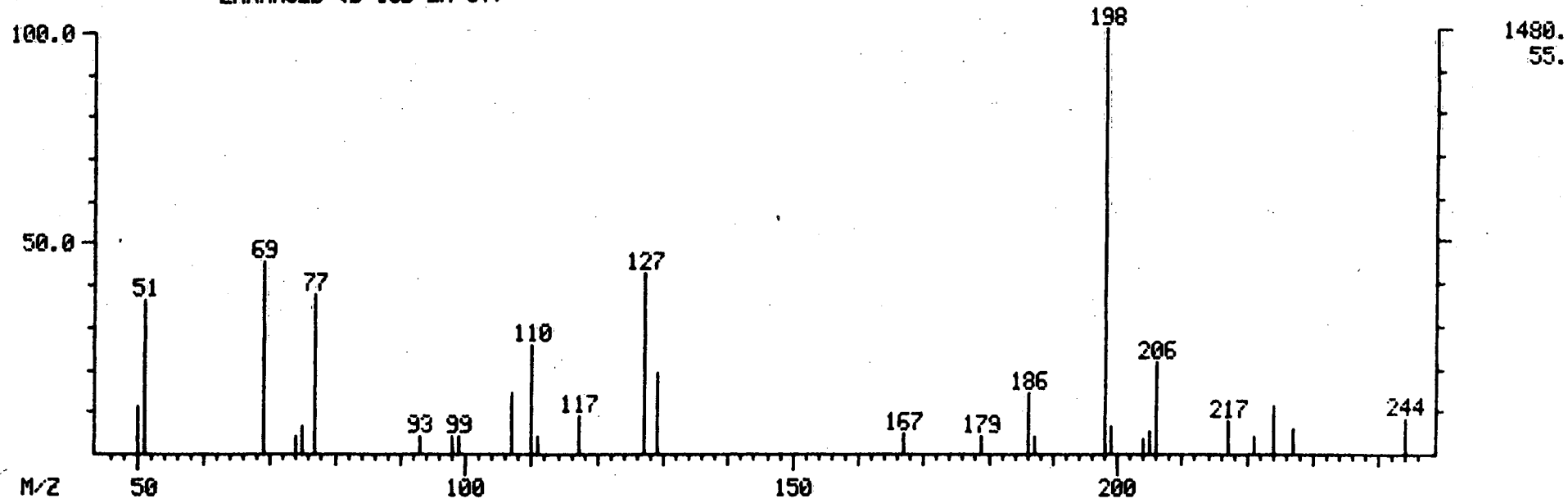
DATA: DFTPP355 #544 SCANS 500 TO 600
CALI: DFTPP355 #2

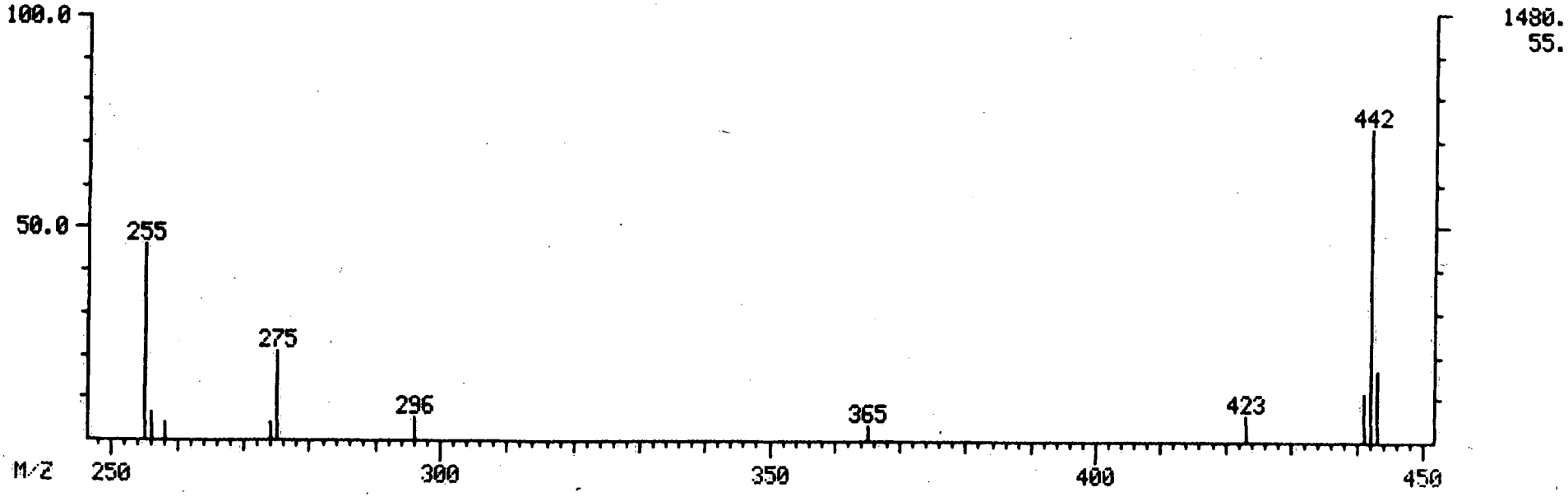


MID MASS SPECTRUM
08/26/87 18:38:00 + 8:10
SAMPLE: 50 NG DFTPP
CONDS.: 625
GC TEMP: 230 DEG. C
ENHANCED (S 15B 2N 0T)

DATA: DFTPP355 #544
CALI: DFTPP355 #2

BASE M/Z: 198
RIC: 12480.

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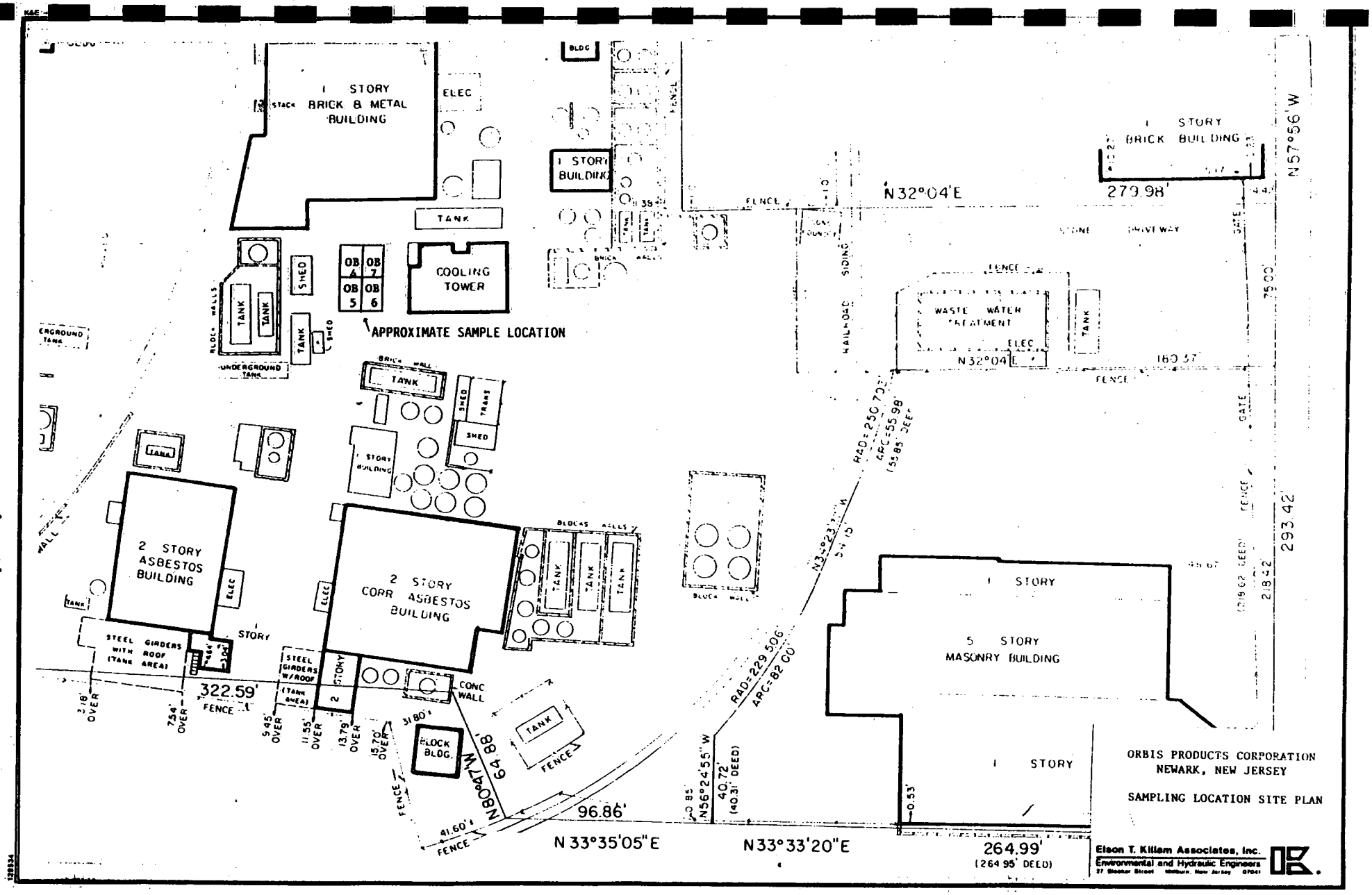


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ORBIS - Pt. 2

REFERENCE NO. 26

672-0111
MARK [illegible]

# PROPOSAL TO DEVELOP A COMPREHENSIVE WASTE TRANSFER PROGRAM

FOR
ESSEX COUNTY, NEW JERSEY

SUBMITTED BY:

SOLID WASTE TRANSFER AND
RECYCLING, INC.

PREPARED BY:

JAMES C. ANDERSON ASSOCIATES, INC.
2615 Route 38
Mt. Holly, NJ 08060

February 27,1987

NOTICE OF LEASE

PLEASE BE ADVISED that ORBIS PRODUCTS, INC. ("Orbis") and SOLID WASTE TRANSFER AND RECYCLING, INC. ("Solid") have agreed to enter into a Lease Agreement under which Orbis, as Lessor, shall rent and Solid, as Lessee, shall hire a portion of certain premises owned by Orbis and located at 55 Virginia Street, Newark, New Jersey for use as a solid waste transfer station and recycling facility. The initial term of the Lease shall be for three (3) years with seven (7) successive options to renew for a term of one (1) year each.

In Witness Whereof, Orbis and Solid have hereunto caused these Presents to be executed by their proper corporate officers this day of February, 1987.

Orbis Products, Inc.

By: Frank J. Amadeo
Pres.

Solid Waste Transfer and Recycling, Inc.

By: [illegible]

# INTRODUCTION

Solid Waste Transfer And Recycling Incorporated (SWTR) is a new New Jersey corporation formed for the purposes of responding to the "Solicitation of interest in having transfer stations included in the Essex County Solid Waste Management Plan" issued by the Essex County Division of Solid Waste Management. The system proposed by SWTR incorporates three proposed new facilities which will satisfy all of the disposal needs of Essex County for up the three years required by the solicitation published by the County or for a longer period if the needs of the County require a longer term operation. Further, the systems proposed can serve as processing points for by-pass and non-processible waste after start-up of the County Resource Recovery facility.

SWTR will lease all three facilities under net-net leases and will contract for operation of each facility over the term of the award. The leases and operating contracts each contain options for extensions should the need for additional disposal capacity arise.

SWTR will supply all administrative functions internally. All scales will be monitored and controlled through a central computer system which can be used to collect waste flow data for use by the County. The system will also be used to monitor transportation equipment throughout its routing to disposal points. All dealings with facility users in terms of billing and collection of receipts will be through SWTR. Payment for use of the facilities will be through advance payments by users and maintenance of a user account through the computer system..

Transportation and disposal of Essex County's waste in the Commonwealth of Pennsylvania will be through an agreement with Chambers Development Company, Inc. pursuant to the letter of intent incorporated herein and under agreements to be executed consistent with an agreement in principal which has been executed between SWTR and Chambers Development Company, Inc.

The program proposes three new transfer stations to be located in Essex County. Two of the facilities will be located in the City of Newark and the third facility will be located in the City of Orange. The Evergreen Avenue, Newark, Facility will have a nominal waste loading rate of 646 tons per day, the McClellan Street, Newark, Facility will have a nominal waste loading rate of 1316 tons per day and the Orange Facility will have a nominal waste loading rate of 706 tons per day. Of the three facilities, two will have the capacity to process a maximum of 1000 tons of waste per day each and the third will have the capacity to process a maximum of 2000 tons of waste per day, for a maximum

a maximum capacity of 4000 tons of waste per day for all three stations combined. Finally, a County-wide recycling facility will be established at one of the Newark sites. This facility will have the capacity to process 80 tons of recyclable materials per day.

Included in this submission is a technical proposal, qualifications and experience, and a cost proposal. Drawings for all of the sites are submitted under separate cover. Each set of drawings contains a title sheet, site location map, plot plan and schematic of the compactor.

# TECHNICAL PROPOSAL

## A. Narrative Description

The municipal solid waste (MSW) transfer program presented herein provides adequate capacity for the transfer, transport and disposal of Essex County's 2,500* tons per day of MSW. SWTR proposes to serve all of Essex County through the operation of three transfer stations and the subsequent disposal at out-of-state, permitted, sanitary landfills. It is expected that these transfer stations and their out-of-state landfills will serve Essex County until resource recovery is implemented, at which time the transfer stations would serve the resource recovery facility.

The transfer station system proposed by SWTR incorporates three new facilities with a maximum design capacity of 4000 tons per day (TPD). Two facilities will be located in the City of Newark, one at McClellan St. and the other at 102-122 Evergreen Avenue. The third facility will be located in the city of Orange at 111 Hill Street adjacent Freeway Drive West between Hickory Street and Oakwood Avenue. The McClellan Street Station will have a maximum design processing capacity of 2000 TPD and an expected loading rate of 1316 TPD, while the Evergreen Avenue and Orange Stations will have maximum design processing capacities of 1000 TPD, and expected loading rates of 646 TPD and 706 TPD, respectively. All three transfer stations are assumed to be working on a 5½ day week. A County wide recycling facility would be established on the McClellan Street site.

The transfer of MSW from collection vehicles to transfer trailers will be accomplished through the use of a compactor-baler system manufactured and developed by Amfab Resources Inc. This compactor-baler, the Trans-Pak 500, pre-loads and pre-weighs a full transport load of solid waste within its own packing chamber producing a densified bale that measures 67 cubic yards (7' x 7' x 37') and weighs up to 27 tons. Compaction density of the unit is controlled by the operator to prevent overloading the transfer trailers. SWTR trailers will be loaded to a maximum of 23 tons to ensure that they do not exceed load limits. Upon reaching a predetermined weight as indicated by an electronic scale readout, the bale will be pushed by the hydaulic packing ram into a transfer

* Based on tonnage provided in Essex County RFP dated 12/10/86 Should the waste quantities of the County exceed 2,500 TPD the facilities as designed can accommodate that larger flow by expansion of the hours of operation for processing waste. SWTR estimates that the maximum capacity of its three facilities is 4,000 TPD.

trailer for transport to the final disposal site. The hydraulic ram has a twenty cubic yard packing stroke, and can build a load in approximately 10 minutes, according to the manufacturer and load a transfer trailer in approximately two minutes.

Loaded transfer trailers will be transported their waste to landfills operated by Chambers Development Co., Inc. located in western Pennsylvania. These landfills are operating under approved Pennsylvania Department of Environmental Resources (PA DER) permits and haveindicated their willingness and ability to accept transfer trailer loads delivered by SWTR for a five year period. (See Appendix A).

B. Transfer Station Information

1. Location

The three transfer stations to be operated by SWTR are located in the City of Newark (two transfer stations will be located in Newark, denoted as Evergreen Avenue and McClellan Street) and in the City of Orange.

a. Newark

1. Evergreen Avenue Transfer Station

The first transfer station will be located on Evergreen Avenue, Newark, New Jersey. The site's tax map designation is Block 3779 Lot 20 and is zoned I3, Third Industrial District. The entire site is approximately 2.87 acres in size. The site is shown on the following USGS 7.5' quadrangle and the map of Essex County, Figures 1 and 2, respectively.

A detailed site location map, has been included separately as an attachment. This map shows surrounding Land Use, Zoning and transportation access for an area encompassing 1500 feet from the property line.
An in depth review of the site reveals the following information:

1. Flood hazard area - The Evergreen Avenue site is not located within the 100-year flood hazard area. The Flood Insurance Rate Map (FIRM) designation for this site is Zone C. (Areas outside the 500 year flood).

2. Wetlands - Upon review of the applicable wetlands maps, it is our opinion that the Evergreen Avenue site is not located in a wetland as defined by the U.S. Fish and Wildlife Service.

3. Historic Sties - The Evergreen Avenue site is not located adjacent to sites listed in the New Jersey and National Register of Historic Places.

4. Recreational or Open Space - The Evergreen Avenue site is not located within areas dedicated to publicly owned recreation or open space use.

5. Critical Habitats - JCA Associates has requested, by letter, that the N.J. Division of Fish, Game and Wildlife make a determination on endangered or threatened species of animals and plants on the site. SWTR will notify the County of the results of this determination when it is made available. (See Appendix I).

6. Wild and Scenic Rivers - JCA Associates has requested, by letter, that the NJDEP's Office of Wild and Scenic Rivers make a determination of possible wild, scenic recreational, or developed recreational rivers at or near the site. SWTR will notify the County of the results of this determination when it is made available. (See Appendix I).

7. Agricultural Development Areas - To the best of our knowledge, the site is not within agricultural development areas.

2. McClellan Street Transfer Station

The second transfer station will be located at McClellan Street, Newark, New Jersey. The site's tax mapdesignation is Block 3773 Lots 15, 41, 43, 45, 53, 63, 923, 980 and is zoned I3, Third Industrial District. The entire site is approximately 6.5 acres in size as shown on the following USGS 7.5' quadrangle and the map of Essex County, Figures 3 and 4, respectively.

A detailed Site Location Map, presented separately as an attachment shows surrounding land use, zoning and transportation access for an area encompassing 1500 feet from the property line.

An in-depth review of the site reveals the following information:

1. Flood Hazard Area - The McClellan Street site is not located within the 100 year flood area. The FIRM designation for this site is Zone C. (Areas outside 500 year flood).

2. Wetlands - Upon review of the applicable wetlands maps, it is our opinion that the McClellan Street site is not located in a wetland as defined by the U.S. Fish and Wildlife Service.

3. Historic Areas - The McClellan Street site is not located adjacent to sites listed in the New Jersey and National Register of Historic Places.

4. Recreational or Open Space - The McClellan Street site is not located within areas dedicated to publicly owned recreation or open space use.

5. Critical Habitats - JCA Associates has requested, by letter, that the N.J. Department of Fish Game and Wildlife make a determination on endangered or threatened species of animals and plants on this site. SWTR will notify the County of the results of this determination when it is made available. (See Appendix I).

6. Wild and Scenic Rivers - JCA Associates has requested, by letter, that the NJDEP's Office of Wild and Scenic Rivers make a determintion of possible wild, scenic recreational or developed recreational rivers at or near the site. SWTR will notify the County of the results when it is made available. (See Appendix I).

7. Agricultural Development Areas - To the best of our knowledge, the site is not located within agricultural development areas.

b. Orange Transfer Station

The third transfer station will be located on Hill Street, just off Freeway Drive West, Orange, New Jersey. The site tax map designation is Block 94 and is zoned Industrial. The area used to house the station is approximately 1.33 acres in size and is shown on the following USGS 7.5' quadrangle and the map of Essex County, Figures 5 and 6, respectively.

A detailed Site Location Map, presented separately as an attachment shows surrounding land use, zoning and transportation access for an area encompassing 1500 feet from the property line.

An in-depth review of the site reveals the following information:

1. Flood Hazard Area - The Orange site is not located within the 100 year flood hazard area. The FIRM designation for this site is Zone C. (Areas outside the 500 year flood).

2. Wetlands - Upon review of the applicable wetlands maps, it is our opinion that the Orange site is not located in a wetland as defined by the U. S. Fish and Wildlife Service.

3. Historic Areas - The Orange site is not located adjacent to sites listed in the New Jersey and National Register of Historic Places.

4. Recreational or Open Space - The Orange site is not located within an area dedicated to publicly owned recreation or open space use.

5. Critical Habitats - JCA Associates has requested, by letter, that the N.J. Division of Fish Game and Wildlife make a determination of endangered or threatened species of plants or animals that may exist on this site. SWTR will notify the County of the results when it is made. (See Appendix I).

6. Wild and Scenic Rivers - JCA Associates has requested, by letter, that the NJDEP's Office of Wild and Scenic Rivers make a determination of possible wild, scenic recreational or developed recreational rivers at or near the site. SWTR will notify the County of the results when it is made available. (See Appendix I).

7. Agricultural Development Areas - To the best of our knowledge, the site is not located within agricultural development acres.

REFERENCE NO. 27

**NUS CORPORATION** TELECON NOTE

| CONTROL NO: | DATE: | TIME: |
|---|---|---|
| 02-8905-06 | 6/15/89 | 11:15 |

DISTRIBUTION:

ORBIS PRODUCTS FILE

| BETWEEN: | OF: | PHONE: |
|---|---|---|
| DAVE OSTERMAN | DIVISION OF HAZARDOUS WASTE MANAGEMENT | (201) 669 3960 |

AND: PAUL BAUER (NUS)

DISCUSSION:

MR. OSTERMAN TOLD ME THE SITUATION AT ORBIS PRODUCTS IS MUCH IMPROVED OVER THE CONDITIONS REPORTED IN 1984. HOWEVER, THEY STILL HAVE PROBLEMS. SOME SOILS WERE REMOVED FROM FORMER UNDERGROUND TANK AREA AND MORE SAMPLING WILL OCCUR. IT LOOKS LIKE MONITORING WELLS WILL HAVE TO BE INSTALLED. THE PERSON WHO CONDUCTED THE INSPECTIONS IN 1984 LEFT THE DHWM AND THE FILE WAS NOT WORKED ON FOR A WHILE. APPARENTLY THERE WAS NEVER ANY FOLLOW-UP TO THE 33 NOV'S ISSUED AS A RESULT OF THOSE INSPECTIONS. THE COMPANY IS SLOWLY DISMANTLING AND SELLING OFF PORTIONS OF THE FACILITY. HE BELIEVES THEY CURRENTLY HAVE ENFORCEMENT ACTION PENDING AGAINST THEM FOR MINOR PAPERWORK VIOLATIONS. THE PLANT IS 50-75 YRS OLD, HE DOESN'T KNOW THE EXACT AGE OF ANY PARTICULAR WASTE UNIT. THE COMPANY IS NOW OWNED BY A CORP. CALLED ADRON (THE REVERSE SPELLING OF NORDA, IT'S PREVIOUS OWNER). IT LOOKS LIKE THE SITE WILL BE REFERRED TO PLANNING REASSESSMENT AND POSSIBLY ASSIGNED TO CASE MANAGEMENT, A DEPARTMENT THAT TAKES CARE OF LONG TERM PROBLEM SITES.

~~ACTION ITEMS:~~

THE DRUM STORAGE AREA WAS DELISTED BY BHWE - THEY DON'T ALWAYS CHECK WITH THE DHWM BEFORE TAKING ACTION ON A SITE. HE DOESN'T KNOW ABOUT CONTAINMENT OF THE DRUM STORAGE AREA OR THE CONDITION OF THE WAREHOUSE.

Paul Bauer

NUS 067 REVISED 0581

REFERENCE NO. 28

Form DWM-002 B
2/84

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
120 ROUTE 156, YARDVILLE, N.J. 08620

# NOTICE OF VIOLATION

EPA# NJDC10910099 DATE 20 Aug 84

NAME OF FACILITY Orbis Products

LOCATION OF FACILITY 55 Virginia St Newark

NAME OF OPERATOR William Amaducci

You are hereby NOTIFIED that during my inspection of your facility on the above date, the following violation(s) of the Solid Waste Management Act, (N.J.S.A. 13:1E-1 et seq.) and Regulations (N.J.A.C. 7:26-1 et seq.) promulgated thereunder and/or the Spill Compensation and Control Act, (N.J.S.A. 58:10-23.11 et seq.) and Regulations (N.J.A.C. 7:1E-1 et seq.) promulgated thereunder were observed. These violation(s) have been recorded as part of the permanent enforcement history of your facility.

DESCRIPTION OF VIOLATION 7:26-11.2 - Containment of Hazardous Waste Sludge more than 90 Days Tank Size 8'x20'x40' - Sludge to be Tested, Pumped, and Disposed of Law Hazardous Waste Regulation

Remedial action to correct these violations must be initiated immediately and be completed by Sept 5, 1984. Within fifteen (15) days of receipt of this Notice of Violation, you shall submit in writing, to the investigator issuing this notice at the above address, the corrective measures you have taken to attain compliance. The issuance of this document serves as notice to you that a violation has occurred and does not preclude the State of New Jersey, or any of its agencies from initiating further administrative or legal action, or from assessing penalties, with respect to this or other violations. Violations of these regulations are punishable by penalties of $25,000 per violation.

Joseph E Hayes Jr
Investigator, Division of Waste Management
Department of Environmental Protection
20 Aug 84

REFERENCE NO. 29

GXla - fac

# State of New Jersey
## DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WASTE MANAGEMENT
32 E. Hanover St., CN 028, Trenton, N.J. 08625

DR. MARWAN M. SADAT, P.E.
DIRECTOR

RICHARD C. SALKIE, P.E.
ASSOCIATE DIRECTOR

Mr. Bill Amaducci, Manager
Orbis Products Company
55 Virginia Street
Newark, N.J. 07114

16 MAY 1986

Dear Mr. Amaducci:

RE: Orbis Products, Status Determination
EPA ID NO. NJD 010 910 099

The Bureau of Hazardous Waste Engineering has received the Status determination of your facility's two (2) underground concrete tanks and two (2) aboveground steel tanks from the Division of Water Resources (DWR). According to DWR, these four (4) tanks are Industrial Waste Management Facilities (IWMF), they are regulated only under DWR, and do not require a hazardous waste facility permit.

However, your facility still operates a third steel tank, which stores hazardous waste. As indicated in our December 10, 1985 letter, under item 3, this tank could be exempted for storage of hazardous waste for less than 90 days. Your facility must apply for this exemption and follow guidelines submitted to you with the December 10th letter.

Item 4 of the aforementioned letter indicates that soil sampling is required for the hazardous waste drum storage area, to assure non-contamination of the soil. Guidelines for this plan were also submitted to you with the same letter.

Please submit to this Bureau documentation concerning the two (2) above mentioned requirements within thirty (30) days of the date of this letter, so the Bureau can proceed with the process of delisting.

REFERENCE NO. 30

**NUS CORPORATION**

TELECON NOTE

| CONTROL NO: | DATE: | TIME: |
|---|---|---|
| 02-8905-06 | June 27 1989 | 16:13 |

**DISTRIBUTION:**

To File: ORBIS Products Corp.

| BETWEEN: | OF: | PHONE: |
|---|---|---|
| Mr. Tivillyes Engr. | Newark City Water Dept. | (201) 733-8414 |

**AND:**

Paul Bauer (NUS)

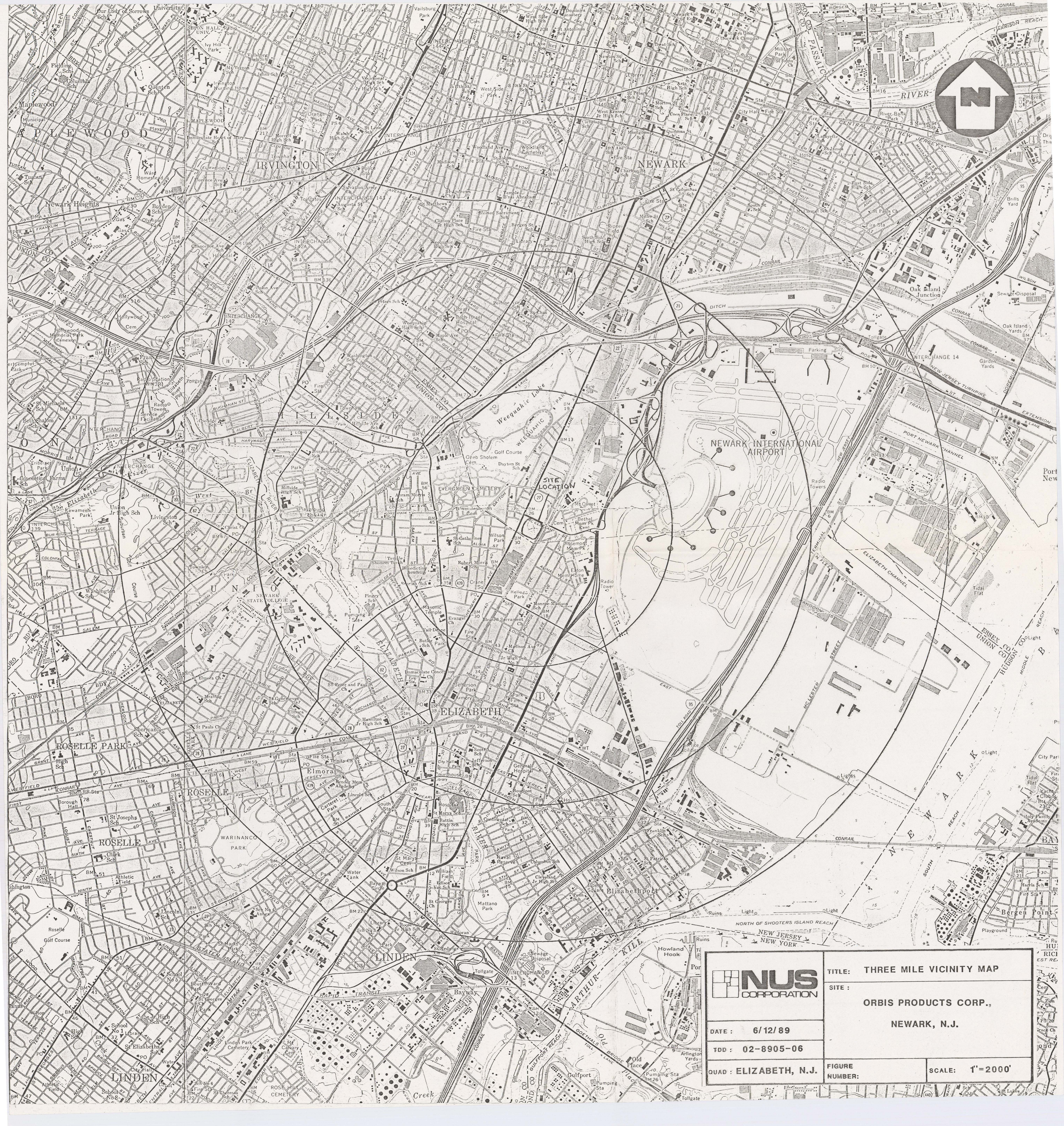
**DISCUSSION:**

Mr. Tivillyes said that storm sewers and sewage lines are connected in the area of the site. Specifically, along McClellan Street and Virginia Street. They travel to a pumping station near McClellen Street Bridge and there to the Passiac Valley Sewage Treatment Plant.

Paul Bauer

**ACTION ITEMS:**

NUS 067 REVISED 0581


IRVINGTON
NEWARK
NEWARK INTERNATIONAL AIRPORT
SITE LOCATION
EVERGREEN CEMETERY
Weequahic Lake
ELIZABETH
ROSELLE PARK
ROSELLE
LINDEN
WARINANCO PARK
ELIZABETH CHANNEL
PORT NEWARK CHANNEL
NEWARK BAY
ARTHUR KILL
NORTH OF SHOOTERS ISLAND REACH
NEW JERSEY
NEW YORK
NEW JERSEY TURNPIKE
PASSAIC RIVER
Oak Island Junction
Bergen Point
Howland Hook
Elizabethport
Bayway
NUS CORPORATION
TITLE: THREE MILE VICINITY MAP
SITE: ORBIS PRODUCTS CORP., NEWARK, N.J.
DATE: 6/12/89
TDD: 02-8905-06
QUAD: ELIZABETH, N.J.
FIGURE NUMBER:
SCALE: 1"=2000'