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FINAL
SITE INSPECTION PRIORITIZATION REPORT
BORNE CHEMICAL COMPANY
ELIZABETH, LNION COUNTY, NEW JERSEY

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VOLUME 2 of 2

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Prepared for:
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Prepared by:
Region II Superfund Technical Assessment And Response Team
Roy F. Weston, Inc.
Federal Programs Division
Edison, New Jersey 08837

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REVISED
FINAL REPORT ON COMPLIANCE WITH ADMINISTRATIVE CONSENT ORDER II BORNE CHEMICAL SITE ELIZABETH, NEW JERSEY

VOLUME I

Prepared for:

The New Jersey Department of
Environmental Protection
on Behalf of the
Borne Chemical Company Site Participating Group

August 26, 1992

REVISED
FINAL REPORT ON COMPLIANCE
WITH ADMINISTRATIVE CONSENT ORDER E
BORNE CHEMICAL SITE
ELIZABETH, NEW JERSEY

Prepared for:

The New Jersey Department of Environmental Protection
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Borne Chemical Company Site Participating Group

Prepared by:

Dunn Corporation
35 Waterview Blvd.
Parsippany, NJ

Project No.:
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Date:
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PREFACE

This revised final report has been prepared based upon the initially submitted final report dated August 30, 1991. The report revisions included herein were required to correct specific deficiencies identified by the New Jersey Department of Environmental Protection and Energy's (NJDEPE's) letter dated October 10, 1991. Other changes or corrections to the report were required due to the delays in shipment of combined TSCA and RCRA regulated sludge from Tank 128, and in the scheduling for disposal of approximately 32 drums of waste material from various sources at the Site. The last loads of tiis material were not shipped from the Site until June 11, 1992.

The NJDEPE conducted a final Site security inspection on June 12, 1992 to verify that all hazardous waste material had been shipped from the Site. The Department also performed a complete perimeter fence, window guard and door lock/seal inspection on this date. Following the successful inspection, the Site secuity guard service, area lighting and other utilities were terminated on June 19, 1992.

The following documents relating to revisions of this report have been added to Appendix A (Relevant Correspondence):

- Letter from NJDEPE, dated October 10, 1991,
- Letter from DUNN, dated December 4, 1991,
- Letter from NJDEPE, dated January 8, 1992,
- Letter from DUNN, dated February 10, 1992.
- Letter from DUNN, dated March 16, 1992,
- Letter from NJDEPE, dated April 23, 1992,
- Letter from NJDEPE, dated June 22, 1992.

EXECUTIVE SUMMARY

The cleanup of the Borne Chemical Company Site (the Site) was performed under the terms of an Administrative Consent Order (ACO II) between the New Jersey Department of Environmental Protection and Energy (NJDEPE) and 19 potentially responsible parties (PRP) known as the Borne Chemical Company Site Participating Group (Group). An earlier consent order (ACO I) had been implemented in 1990 to provide improved Site security measures pending the implementation of the cleanup action documented in this report. Remediation management for both projects was performed by Dunn Corporation (DUNN). The Borne Chemical company had operated as a custom blender and packager of petroleum products from 1916 until its bankmptcy in 1984. In the 1970's and early 1980's sections of the facility were also used in the handling and processing of waste material.

During the course of removal and disposal work at the Site over 500,000 gallons of waste water, assorted liquid petroleum hydrocarbons and sludge, and over 1,600 tons of trash and debris were removed from the property. Work also included the characterization, consolidation and disposal of over 1,300 drums of unknown materials. The plant and equipment consisted chiefly of three large multistory process buildings which contained over 150 process vessels ranging in size from 50 to 8,000 gallons. The remainder of this 7-acre Site consisted of six other stmctures, a large covered, loading dock and warehouse area adjacent to the Arthur Kill waterway, and a 1 acre bermed area at the north side of the property which contained 23 above ground storage tanks ranging ia size from 35,000 to 100,000 gallons (the Tank Farm).

Site work began in September 1990 with the collection of surface trash and debris from the Site grounds and from within the buildings. Parallel with this task, samples of the material contained in each drum and tank phase where collected for waste profiling and characterization analysis. Over 140 samples of tank material and 1,300 samples of drummed waste material were analyzed for Resource Conservation and Recovery Act (RCRA) and Toxicity Characteristic Leaching Procedure (TCLP) parameters. The disposal options for waste material from the Site stressed incineration in RCRA Part B permitted facilities for low BTU value, poor quality petroleum hydrocarbons, and fuel recycling in approved cement kilns for high BTU value, good quality petroleum hydrocarbons.

Over 7,000 linear feet of 2 to 4-inch diameter underground process transfer pipe was uncovered, cleaned and removed from the Site during the cleanup work. Following pipe removal, over 12,000 square feet of outdoor soil and indoor earthen floor areas were covered with stone, asphalt or concrete pursuant to NJDEPE requirements concerning fire or explosion

hazards associated with the presence of black, hydrocarbon stained soils. Steps were taken to ensure the segregation of clean cover material from stained soils. Most of the building interior process piping was also removed during the cleanup of the buildings. It was found to be easier to remove the interior piping, clean it outside of the buildings and recycle it for its steel value, rather than to clean it in-place. During the course of building cleanup, the removal of other steel process equipment was also performed. All recycled steel was delivered to the saine scrap dealer, P. Feldman and Sons, and one check for payment of the value of this material was made to the Group at the completion of the project.

The Group, in concert with DUNN and the cleanup contractor, Stout Environmental Service, initially established a disposal matrix of approved primary, secondary and in some cases tertiary facilities which would receive the various classes of waste generated from the Site cieanup. Each faciiity was evaluated by the Group to detemine its ability to dispose of materials in a lawful and pmdent mamer. During the course of performing the cleanup work, two new facilities were added to the list to accommodate newly discovered waste steams (F-listed aqueous wastes and high BTU value land disposal restrirted sludges for liquefaction). These facilities required a successful on-site audit prior to adding them to the approved disposal facility list. All disposal facilities used were reviewed by the NJDEPE.

Sludges were stabilized in their original storage tanks with either kiln dust or saw dust to control free liquids for transportation. Those materials which were not land disposal restricted (LDR) were sent to a RCRA Part B permitted hazardous waste landfill. Sludges and solids which were LDR where shipped to RCRA Part B permitted incinerators, either in bulk or in drums, for disposal. Some sludge with high BTU value was shipped to a fuel blending faciiity for liquefaction and burning in cement kllns as recycled fuel.

Only one tank (Tank 128) was found to have polychlorinated biphenyls (PCBs) in concentrations above 50 parts per million (ppm), but less than 500 ppm. The Group had originally selected SCA in Chicago, IL as the primary disposal facility for PCB contaminated materials with ENSCO in El Dorado, AR as an alternate. Unfortunately, an explosion in the SCA incinerator in February 1991, and a major change in business pollcy regarding PCB material by ENSCO in March 1991, eliminated both disposal facilities from use by the Group. A general industry-wide lack of disposal capaclty for PCBs in early 1991, and the fart that the material in Tank 128 was also RCRA regulated, further complicated the Group's ability to locate a disposal facility. It was not until early-June 1991 that Rollins Environmental Services in Deer Park, TX was identified as the disposal facility for this material. Shipments to Rollins

began in late June 1991, following a 9 day shut down of the incinerator for maintenance from June 12 to June 22, 1991. Final shipment was completed on March 25, 1992.

On May 17, 1991, a leak in Tank 127 in the Tank Farm released approximatcly 13,000 gallons of waste water, petioleum hydrocarbons and sludge into the accumulated rain water within the Tank Farm containment area. Initial cleanup efforts were completed on May 24, 1991 and resulted in the collection of approximately 8,000 gallons of spilled hydrocarbons from the water surface. During June and July, additional cleanup work was performed to remove stained soils and access road stone from the Tank Farm area for off-Site disposal.

The original work plan did not specify the removal of tanks from buildings or outdoor areas at the Site. However, during the course of work it was determined that steel recycling was an acceptable altemative to cleaning in-place, and the removal of sludges from 11 of the Tank Farm tanks resulted in such damage to the tanks that complete demolition and scrapping was the best course of action. As a result of the Tank 127 spill incldent, it was later determined that the scrapping of the remaining 12 tanks in the Tank Farm was necessary to allow for the removal and cleaning of temporary access road stone which had been placed in and around the tanks prior to the spill. Therefore, all tanks in the Tank Farm have been removed and disposed of through stecl recycling.

Site work was substantially completed on June 11, 1992 with the removal of the last wastes from the Site. Between February 1991 and August 1991, the NJDEPE had inspected and accepted the cleanliness and physical security of each bullding and work area at the Site as it was completed. A major milestone of project completion occurred on May 30, 1991 when all bulldings and the general site (except for the Tank Farm, general debris staging areas and the equipment decontamination area) were accepted by the Department as completed.

This project has resulted in the successful removal and disposal of hazardous materials from an abandoned Site by the efforts and funding of some of the private companies which had been named as PRPs by the NJDEPE. The planning and unplementation of this project was characterized by a high degree of cooperation and understanding between the NJDEPE and the Group which allowed for a safe, cost effective and environmentally sound solution to a potential environmental pollution and publlc safety problem.

1.0 INTRODUCTION

The Borne Chemical Company was a custom blender of petroleum products from the early 1900's until its bankruptcy in 1984. Also during its operations, the company leased building and warehouse space and tank capacity to various companies, including one or more waste disposal and chemical recycling companies, for storage or waste disposal activities. The company sold off any salable product leaving approximately 500,000 gallons of contaminated waste liquids and sludges, some tainted with polychlorinated biphenyls (PCB's) and other off specification products at the site. Over 1,300 drums of unknown waste materials also remained on the property at the time of bankruptcy. The New Jersey Department of Environmental Protection and Energy (NJDEPE) became involved in the site cleanup activities in 1985 pursuant to the New Jersey Spill Compensation and Control Act (N.J.S.A. 58:10-23.11). Figure 1 is a Site Plan Drawing prepared before clean-up work was begun.

The NJDEPE has identified over forty firms as Potentially Responsible Parties (PRPs) in the cleanup of this site. The PRPs formed a committee to deal with the allegations regarding the site and retained Dunn Corporation (DUNN) as their environmental and remediation management consultant. In 1986, DUNN assisted a group of PRPs in soliciting informal cost estimates for the removal and disposal of bulk and drummed waste materials at the site, but a contract for the work was not awarded at that time. The Department issued a directive to the PRPs to improve site security. Subsequently, under an Administrative Consent Order (ACO I, October 5, 1987) with the NJDEPE a group of 17 companies agreed to improve site security. DUNN prepared a work plan for the security improvements which was approved by the NJDEPE in early 1989. DUNN solicited bids for the work and provided construction management and oversight during implementation of the site security improvements, which were substantially completed in May 1989. Details of this activity are summarized in a repoct entitled Site Security Work Plan, dated March, 1989.

The PRP's which make up the Borne Chemical Company Site Participating Group (the Group) are listed in Table 1-1. The Group negotiated a second Administrative Consent Order (ACO II, September 28, 1989) with the NJDEPE for the removal and disposal of bulk and drummed wastes at the site. DUNN prepared a performance oriented bid specification for the removal and disposal work, and a means and methods specification for asbestos abatement work at the site. Both plans received conditional approval from the NJDEPE in February 1990. The asbestos abatement work was separately bid in March 1990 and the selected contractor completed work in May 1990. Details of this activity are summarized in a DUNN prepared report entitled Asbestos Abatement Repoct (Juae 1990). The contract documents for the removal and disposal bid package were finalized in late March 1990, the project was bid in

May 1990, and the removal and disposal work was awarded to Stout Environmental Services, Inc. (Stout) on August 15, 1990.

Stout prepared a Waste Characterization and Sampling Plan, and a Detailed Technical Work Plan prior to beginning work at the Site. Both documents were reviewed by the NJDEPE and conditionally accepted in September 1990. Work began at the Site in early September 1990.

TABLE 1-1
MEMBER COMPANY LIST
BORNE CHEMICAL COMPANY
SITE PARTICIPATING GROUP

AGIP USA, Inc.

Beil Telephone Laboratories Incorporated

Buckeye Pipe Line Company, L.P.
A Delaware Limited Partnership by
Buckeye Pipe Line Company
A Delaware Corporation
Its Sole General Partner

Santa Fe Braun, Inc. formerly known as
the C.F. Braun Company

Chesebrough-Pond's Inc.

Consoildated Rail Corporation

E. I. DuPont de Nemours and Company

Exxon Corporation

Getty Oil Company & Texaco Inc.

Marisol, Incorporated

Mobil Oil Corporation

NL Industries, Inc.

The Ocean Oil Company Limited

Orange and Rockland Utiilties, Inc.

Phelps Dodge Copper Products Company,
A Division of Phelps Dodge Industries, Inc.

Public Service Electric & Gas Company

Thomas & Betts Corporation

Food Haulers Incorporated

Wakefern Food Corporation

2.0 SPECIFIC WORK ELEMENTS

The cleanup, removal and disposal work described in this repoct was performed by Enroserv of Northem New Jersey which is the ficld services company of Stout Environmental Services, Inc. The cleanup contractor wlll be hereafter referred to as "Stout".

A Bid Specification for Removal and Disposal Work ("Specification") was prepared and used in the selection of a removal and disposal contractor. To allow for innovative and cost effective completion of the project, the Specification allowed for the exact means and methods of performance to be developed by the successful Contractor during the bid and initial performance phase of the contract, subject to review and approval by the NJDEPE. The Specification defined required work clements, regulatory requirements and specific performance objectives for each work clement.

An initial inventory of above ground and in-bullding storage tanks was performed for the NJDEPE by an outside contractor in 1986. The repoct is titied, "Bome Chemical Company Site Tank/Vessel Inspections Repoct", prepared by Agullar Associates (1986). This repoct provided the initial basis for the volume, analytical make-up and location of tankage identified in the Specification, but it provided no information regarding the quantity and contents of drums, trash and debris at the Site. Dumn Corporation (DUNN) provided technical and remediation project management services to the Group in the implementation of the clean-up work.

The basic work plan requirements were to empty and clean all tankage and piping on the site, and to remove all trash, debris and splll residue which might pose a fire and explosion hazard. The work plan did not require bullding surface decontamination or soil and ground water investigation or remediation except as related to fire and/or explosion hazards. The NJDEPE approved the completion of each major work area at the time of completion to allow for the immediate correction of any deficlencles prior to Stout moving men and equipment to the next work area.

2.1 Drum Inventory and Photographic Records

Stout prepared a site specific sampling characterization form repoct for all drums and phases within tanks. The characterization form recorded details of the specific product and container including:

- Drum number and location,
- HNu readings of the container during sampling,
- the container type (i.e. drum, tank, other),
- the type of waste in the containers, (i.e. ilquid, soild, sludge, etc.)
- the estimated composition of the waste,
- the number of samples taken from the container and location of sampling,
- the date and time of sample coilection,
- any field observations and weather conditions at the time of sampling, and
- any recognizable markings on the container.

Each drum was given an alpha-numeric identification number by building and location within the building. For example, drum number B-2-A-100 can be identified as:

B- Building B,
2- 2nd floor,
A- Zone location within building;
100- Sequential number of the drum.

Zone locations A, B and C were used to identify 3 distinct areas on each floor of Building B. The existing walls on each floor were used as dividing lines to separate the zones. Zone A is located in the westem area of each floor, Zone B is in the middle section of each floor, and Zone C is the eastem area of each floor.

Buildings A, C and the A/B Loading Dock were one story areas which were not separated into zones. A typical drum number from one of these areas would be A-200. This would identify the drum as found in Building A and the 200th drum sampled. Similar alpha-numeric identifications were used for Building B and A/B Loading Dock drums. The drum and tank inventory is found in Appendix B. Refer to Figure 4 for zone locations in Building B.

Appendix C contains photographic records of project work progress and site drums which had legible labels and/or markings. Ail legible markings found on fhe drums are ineluded in fhe photographic report, however, not ail drums with each type of marking are ineluded in the

report because it was not cost-effective to duplicate photographs to show the identical markings found on each group of drums. Photographs for this report were taken by field technielans at the time of drum sampling aind in some cases are of poor quality.

2.2 Consolidation and Sampling of Liquid and Sludge Materials

2.2.1 Field Sampling and Laboratory Analysis

Sampling of all tanks and drums was performed in accordance with Stout's Sampling and Waste Characterization Plan, dated September, 1990 which was approved by the NJDEPE prior to implementation. Most drums were accessed by unscrewing the bung hole on top of the drum. Other druns did not have a top lid. Four drums were opened by using a special 'punch' which is discussed in Section 2.5.5. Samples were taken from the drums using dnnı thieves. One drum thief was used for each drum sample and then discarded. Sampling in Bullding C was performed in Level B Personal Protective Equipment (PPE) whlle drum sampling in Bulldings A, B, and A/B Loading Dock was performed in Level C PPE. As samples were taken from drums and tanks, Stout completed a elıaracterization form for each sample as discussed in Section 2.1.

A sample of each drum was taken for fingerprint analysis of the material to determine critical compatibillty criteria for later compositing of individual drum samples for full TCLP and RCRA analysis. This analysis was conducted in Stout's on-Site lab. Samples were tested for the following material chararteristics:

- State of material,
- Odor,
- color,
- pH,
- Flash Point,
- Radiation,
- Reactivity,
- Specific Gravity,

- Solubility with Hexane and water, and
- Oxidation.

This information was used to determine which drums posed a potential relocation and sampling problem. As a result of the fingerprint analysis, all drums except the four drums discussed in Section 2.5.5, were considered safe to move.

All samples from site tanks and drums were analyzed by Nytest Environmental, Inc. labs (under subcontrart to Stout) located in Port Washington, NY for RCRA/TCLP parameters. Results of testing were used to coordinate the disposal consolidation decisions and are included in Appendix D of this report.

2.2.2 Determination of Compatibility

Consohdation decisions were made from the tank and drum laboratory analysis by Stout's Technical Representative with approval of the consolidation decisions by DUNN. Meetings were held between the two parties throughout the consolidation process to develop the most cost-effective disposal criteria. The consolidation decision process began in Ortober , 1990 and was completed in June, 1991.

Drummed material from the Site was bulked into 142 composites. Each composite contained approximately ten drums of compatible material. Material compatibility was based on the pH, reactivity, BTU value and flashpoint of each drum. Each composite was identified as hazardous or non-hazardous. Table 2-1 lists the composites which were transported by manifest number and their respective waste codes. A copy of this table is included in Volume X. Appendix E identifies the composites and the volume of material removed per composite. The majority of this material was transported to the Giant Cement Company kiln for incineration. Other composites were transported to GSX; Rollins, NJ; Rollins, TX; DuPont; Waste Conversion, Inc. (WCI); and ENSCO.

Composite loading was accomplished by locating the drums contained within a composite and vacuuming the material out of the drum using a 6-inch vacuum hose connerted to a vac tmck. Composites transported to Giant were bulked together into hazardous loads, non-hazardous loads and a combination of hazardous and non-hazardous loads. A hazardous waste manifest was completed for the combined transportation of hazardous and non-hazardous loads.

TABLE 2 - 1 (Continued)

DRUM COMPOSITE TRACKENG SUMMARY

DRUM COMPOSITE NUMBERS IDENTIFIED BY MANIFEST DOCUMENT NUMBER, DISPOSAL FACILITY AND WASTE CODES

DISPOSAL FACILITY	MANIFEST #	COMPOSITE NUMBERS	WASTE CODES FOR MATERIAL*
ROLLINS, TX	91283	8, 50, 99, 100, 102, 118, S-1, S-3, S-11, S-22	X725, D00S, D018, D022, D036, D039 D040, F001, F004, F005
	91282 91283 91288 91289 91294 91295 91296 91299 91303	Spill cleanup and debris resulting from drum compositing and spill cleanup work.	X725, F001, F004, F005, D00S, D018, D022, D036, D039 and D040
DUPONT	91133* (NJA0637122)	3, 4, 21, 28, 52, 71, 88, 95, 121, 123, 124	X722, Non-Hazardous
GSX	91202*	13, 14, 39, 54, 58, 63, 76, 79, 103, 106, 126, 128, S-2, S-5, S-6, S-7, S-9, S-10, S-12, S-13, S-14, 5-16, S-18, S-19, S-21	X725, Non-Hazardous Manifested as X725, D00S, D018, D019, D022, D039
		S-4, S-17, S-20	X725, D00S, D039
WCI	91249	S-8	X750, D009
Lab Packs	91218 91219 00100 2229382 2229522 (empty 55 gal drums)	Samples & Reagents from Laboratory Building and other site locations	D002, D003, D005 and P028 D001, D002, D008, D011, F005, U239, U052, U031, U069, U044, U211, U226, U188 and U037.
ENSCO (PCB)	91060**	36, 45 F001	X750, D00S, D039,

* Denotes waste code for identified composite material. Other material from site may have been included with each respective load thus changing the waste code(s) for any specific manifest. See specific manifest for exact waste codes.

** Notation not written on manifest. The manifest document number assigned to the series of composites represents the most probable manifest the material was transported under.

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TABLE 2 - 1

DRUM COMPOSITE TRACKING SUMMARY

DRUM COMPOSITE NUMBERS IDENTIFIED BY MANIFEST DOCUMENT NUMBER, DISPOSAL FACILITY AND WASTE CODES

DISPOSAL FACILITY	MANIFEST #	COMPOSITE NUMBERS	WASTE CODES FOR MATERIAL*
GIANT	91064	2, 5, 10, 22, 25, 26, 27, 33, 35, 38, 42,43, 44	X722, F001
	91073	2, 5, 10, 17, 18, 22, 23, 25, 26, 27, 33, 35, 38, 40, 42, 43, 44	X722, D001, D017, D022 D028, D030, D036, F001
	91076	2, 5, 10, 17, 18, 22, 23, 25, 26, 27, 33, 35, 38, 42, 43, 44,	X722, D001, D017, D022 D028, D030, D036, F001
	91080	2, 5, 11, 12, 17, 18, 19, 22, 23, 25, 27, 33, 35, 38, 42, 43, 44	X722, D001, D017, D022, D028, D030, D036, F001
	91121	9, 12, 19, 24, 41, 59, 60, 66, 68	X722, Non-Hazardous
	91132	1, 2, 7, 15, 31, 32, 37, 51, 53, 55, 61, 72, 73, 75, 83, 84, 86, 91, 92, 94	X722, D001, D00S, D008 D018, D019, D027, D035, D039, F001, F003, F005
	91134	9, 12, 15, 24, 31, 32, 37, 51, 53, 55, 61, 72, 81, 84, 86, 90, 91, 96, 101, 104, 107, 108, 111, 114, 115, 119, 120, 121	X722, D001, D00S, D007, D018, D019, D027, D035, F001, F003, F005
	91140	1, 9, 12, 15, 24, 31, 32, 37, 47, 49, 51, 53, 55, 61, 72, 73, 81, 83, 84, 86, 90, 91, 92, 94, 96, 99, 101, 104, 105, 107, 108, 109, 110, 111, 113, 114, 115, 119, 120, 122, 127	X722, D001, D008, D022, D034, D035, D039, D040, F001, F003, F005
RES, NJ	91256	6, 30, 56, 57, 74, 77, 82, 83, 85, 89, 93, 97, 112, 116, 117, 125	X722, D001, D002, D008, D040, F001, F003, F005
	00001 00002	56, 74, 77, 82, 83, 89, 112, 116, 117, 125	
ROLLINS, TX	91282	8, 50, 94, 100, 102, 118, S-1, S-3, S-11, S-22	X725, D00S, D018, D022, D036, D039 D040, F001, F004, F005

Tank compatibllity and consolldation decisions were made on a phase-by-phase basis from the analytical data. Compatible tank phases were bulked together for transpoct to the disposal facillty. Refer to Table 2-9 for tank material disposal quantrties and disposal facility.

2.3 Below-Ground Transfer Pipe Removal

General area pipe removal at the Borue Chemical Company Site consisted of removing below-ground piping, typically 4-inches in diameter or less, which was not directiy associated with attached tanks. The location and direction of pipe was determined by tracing a pipe or series of pipes to its termination point. Tracing was accomplished using a Case 580 backhoe to expose the top of each pipe and manual labor to excavate the remaining soil around the pipe. Figure 2 identifies the areas on-Site from which below-grade piping was removed.

Excavation of below-ground pipe revealed pipes which were elther open-ended or which had closed fittings. Piping connected the tanks in tiie Tank Farm to tanks and equipment in Bulldings A and B elther directiy or indirectiy via other Bulldings (e.g. Bullding Fi). Each pipe was inspeeled to determine if product was contained within the pipe. Closed end pipes were cut on top with the use of a metal saw to verify if product was contained in the pipe. If a pipe contained product, it was removed by use of a vacuum truck which vacuumed the product out of the pipe. The product contained in the vacuum truck was drummed, fingerprinted and staged in 55-gallon drums for disposal with otiier compatible bulk product from the Site. Pipe was removed from the ground by cutting it into manageable lengths, typically 8 to 12-foot. Absorbent pads were stuffed into each open end of the pipe to absorb any residue remaining in the pipe. These pads were later disposed of as contaminated debris.

The process of cutting pipe and removing the contents generated less than 100 gallons of oll and grease from all umderground transfer pipe removal work. Most pipe runs were completely empty or contained only small quantities of fiowable inaterial which coilld be captured. The captured material was chemically fingerprinted and then consolidated with compatible bulk shipments of oll and grease. No specific record was made of which bulk shipments ineluded this small quantity of removed materials. Most of the pipe contents removad work was done by running absorbant pigs through the pipes, or by vacuum and steam eleaning. The resultant residue (rinsate and absorbant pads) was collected and disposed of as petroleum contaminated solld waste.

Two pipe storage areas were construcled approximately 35-feet north of Bullding B as shown in Figure 7. These staging areas were constructed as follows:

- A layer of 10-mil polyethylene sheeting (poly) was placed on the ground;
- a layer of geotextile fabric was placed on top of the poly to act as a barrier to retard the diselıarge of any remaining product from the excavated pipe to the poly layer;
- a layer of poly was placed on top of the geotextile fabric to decrease the chance of damage to the fabric;
- pipe was tiıen placed on top of the poly and a cover of poly was placed on top of tiıe excavated pipe to shelter it from the weatiıer.

Pipe excavations was initiaily determined to be undertaken in Level D PPE, but was upgraded to Level C PPE when Stout's Health and Safety Officer recorded high HNu readings (20 ppm) at the initial excavation point. Level C PPE was required throughout the remainder of below-groımd excavations.

Pipe excavation and removal stacted at a location 25-feet east of Tank 122 on October 16, 1990. The pipe traelng operation began at this location due to a series of accessible above-ground stand-pipes. These pipes were traced north, south, east and west of this origination point. Hgure 2-A details this area. The initial pipe removal operation concentrated on removing below-ground piping in areas scheduled for soil capping. Once these areas were complete, the removal operation shifted to areas outside the soil capping plan.

The first area within the soil capping area to be excavated was the A/B Corridor, an area bounded by Buildings A, B, and the A/B Loading Dock. Removal of below-ground piping from the A/B Corridor stacted October 16, 1990 and was completed October 24, 1990. See Hgure 2-B for the A/B Corridor pipe locations. Piping was then traced and removed from other soil capping areas between Buildings A, B, C, D and E and ımder the hanging tanks in Building A. Pigure 2-C shows the piping removed ımder the hanging tanks. Pipe removal in these areas was completed November 3, 1990. The next area to be excavated was the pipe manifold located on the north side of Building H also known as the Pump House. A manifold system located on the north exterior wail of Building H showed 24 pipes extending below-ground.

The manifold excavation exposed ten pipes which continued away from the Pump House, varying in diameter from 2-inches to 3-inches, which were traced to the Tank Farm (see Hgure 2-D). Approximately 35 feet north of the manifold excavation at Building H, the pipes were

traced to a concrete channel which carried ail ten pipes to the Tank Farm. Seven pipes continued straight through the Tank Farm berm and 3 pipes angled approximately 45-degrees to the northeast and through the berm. The channel was located approximately 6-inches below-ground and was 2-feet deep and 4-foot wide. Dirt fiil covered ail pipes which were positioned on the bottom of the channel. Ail valves on the tanks located witiin the Tank Farm berm were ehecked to assure fhey were in the elosed position prior to cutting and removal of pipe. The pipes were checked for produrt, vacuumed if necessary, then cut on the north side of the berm. The pipes were tiien removed and placed in the pipe staging area. Absorbent pads were stuffed into ail open-ended pipes. The pipes left on the north side of the Tank Fann berm were angled silghtiy toward vertical (approximately 10 degrees) to stop any residual discharge from the pipes during Tank Farm material removal. The Tank Farm berm was replaced after excavation operations. The piping within the Tank Farm was handled during final eleanup of that area. Refer to Section 2.6.1 for details on Tank Farm pipe removal.

Eleven pipes varying in diameter from 2-inches to 3-inches were traced between Buildings Fi and F (see Figures 2-E and 2-F). Five of these pipes terminated short of the north railroad tracks, two pipes terminated on the south side of these railroad tracks and four pipes terminated in a concrete pad measuring 12-feet x 12-feet x 2.5-feet located on the south side of Building D. Excavations were made on each side of the concrete pad to determine if other piping emanated from the pad. A 2-inch diameter pipe on fhe west side of this pad was located and traced. This tracing led to another series of 3-inch diameter pipes which were traced west along the north railroad tracks (see Figure 2-G). These pipes elther terminated along the tracks or at utiilty pole (#11688 PS), located on the north side of the north railroad tracks near tiie Office Building.

The three pipes remaining at the manifold were then traced east of the manifold along Building Fi (see Figure 2-Fi). Two of these pipes terminated in Building B and the third pipe traveled imder a 12-inch thick concrete pad. The pad extended the length of Building B and it was therefore deelded, with the approval of the NJDEPE, to leave the remainder of this below-ground pipe inplace. The pipe was cut at the east and west concrete edges with both ends sealed with grout. Pipe excavation from the north side of Building Fi started on November 7, 1990 and was completed November 16, 1990.

Below-ground piping was also located on the west side of Building A (see Figure 2-1). The four, 3-inch diameter pipes which originated under the foundation of Building A, were traced under a 3-inch concrete pad to the northwest comer of Building A. The concrete pad was chipped away to expose the pipe which made a 90-degree tum to the west and ran approximately 8-feet before terminating. The pipes were cut at the concrete pad and grouted.

Two, 2-inch steel pipes were traced from the northeast side of Building C. Figure 2-J shows the location of these pipes and their respective termination points.

The NJDEPE inspected all pipe removal as this work progressed. Pipe trenches were left open after pipe was removed to allow the NJDEPE to inspect and approve the removal of pipe before the trenches were backfilled. The NJDEPE approved the satisfactory completion of the below-ground pipe removal on November 28, 1990.

The excavated pipe ranged in diameter from 1-inch to 4-inches. The quantity of excavated pipe was measured on November 6 and 7, 1990 and on November 28 and 29, 1990. Pipe removal was originally scheduled for 10 working days, but took 24 working days to complete due to the increased quantity of pipe located and removed. The quantity of below-ground pipe removed from the site totaled 7,459 linear feet including 512 linear feet removed from the A/B Corridor. Table 2-2 details the size and quantity of below-ground pipe removed from the Borne Chemical Company Site.

2.4 Soil Capping Work

The soil capping project at the Borne Chemical Company Site was undertaken after certain areas of the site were deemed to be potential fire or explosion hazards by the NJDEPE. The Group retained Hazards Research Corporation of Mount Arlington, NJ as their technical representative in this matter. An extensive literature review did not identify a standard test which was acceptable to the NJDEPE for measuring or quantifying the flammability of soils. After much discussion, it was decided to identify potentially hazardous areas by subjective visual inspection, and to cap each suspect area with stone, concrete or asphalt to mitigate the fire hazard of each identified area.

Oil stained areas of the Site were investigated by Mr. William Cruice of Hazard Research Corporation and Mr. Paul Nienaber of DUNN on June 6, 1990 to determine those areas which would require capping based upon a subjective visual examination of the stained soil areas. Mr. Frank Groman of the NJDEPE was also present, as an observer, during this investigation. Results of the investigation identified eleven areas (see Figure 6) on the Site in which a potential fire or explosion hazard was suspected. DUNN prepared a Soil Capping Work Plan in August, 1990 to implement the capping of these areas. The plan was conditionally approved by the NJDEPE in August, 1990 and the soil capping work was performed between October and December, 1990 as a parallel task to the removal and disposal work being performed at the Site.

TABLE 2-2

GENERAL AREA PIPE INVENTORY

BORNE CHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

	Location and Quantity, FT		
Pipe Diameter, In.	A/B Corridor	General Site	Total
1.0	–	591	591
1.5	–	124	124
2.0	352	1,238	1,590
2.5	–	312	312
3.0	136	4,289	4,425
4.0	24	393	417
TOTAL	512	6,947	7,459

A layer of geotextile fabric was placed over the original ground surface in each capped area to delineate elean fiil material imported to the Site from the contaminated soil. In the A/B Corridor (cap area S-4) and umder the hanging tanks in Building A (cap area S-1) there was concem that the proposed hard, non-porous cap would ailow noxious or flammable vapors to be forced into adjacent buildings. Therefore, the cap design in both of these areas ineluded a shailow stone fiiled trench with PVC standpipes to the surface to ailow for vapor coilection and control procedures to be implemented in the future, if necessary.

Below-groumd process piping and debris located in the various soil capping areas was removed by Stout prior to the stact of the soil capping work. The pipe removal activities are documented in Section 2.4 and ail work was subject to the inspection and approval of the NJDEPE prior to the elosing of excavations and beginning of soil capping work. G.L. Neviile Constmction Inc., an environmental contractor, was selected by the Group to perform the soil capping work. DUNN provided oversight of this work and coordinated work activities between G.L. Neviile and Stout.

The foilowing paragraphs detail, by soil capping area, the dates and activities of G.L. Neville Constmction which were required to complete the soil capping work. Figure 6 details the soil cap work areas discussed in this Section.

Soil Cap Area S-1

This area is umder the hanging tanks in Building A and it is approximately 4,125 square feet (55 x 75). The natural grade of the area is from west to east. Work began on November 20, 1990 with the excavation of two vapor trenches with dimensions 1-foot deep x 2-feet wide x 50-feet long. The trenches were located between building supports and were fiiled with 3/4-inch washed stone. In each trench, two, 4-inch diameter PVC sampling standpipes were placed at equidistant points along the trench line. Approximately 40 cubic yards of sand was deilvered to the site and stock piled at the west side of Building A. Geotextile fabric was placed on the ground surface of S-1 under the hanging tanks. The sand was placed using wheelbarrows and shovels and was spread to a uniform 3-inch depth.

Wire mesh (6-inch x 6-inch) reinforcing steel was placed on top of the sand and 3,000 psi concrete was poured to a 3-inch depth over the soil cap area. Concrete was transported into the cap area using motorized wheelbarrows. The wire mesh was puiled up 1.5-inches as the concrete was poured to set the wire mesh in the middle of the concrete pour. The concrete was poured and finished so the final slope of the concrete floor would take accumulated ilquid

away from the wails and centralize any ilquid in the northeast area of the cap. This centralized area is located approximately 10-feet west of the interior door on the east wail of tne cap area. This work was completed on December 7, 1990. The NJDEPE inspected the cap on December 18, 1990 and accepted the completed work.

Soil Cap Area S-2

This area is inside of Building A, just east of area S-1 and is approximately 360 square feet (12 x 30). Geotextile fabric was placed in the area on November 2, 1990 and a 3-inch layer of quarry processed stone (QP) was spread over the geotextile. A 2-inch covering of asphalt was appiled to the area on November 20, 1990. The NJDEPE inspected the cap on December 18, 1990 and accepted the completed work.

Soil Cap Area S-3

This area is located in the interior southwest corner of Building A and is approximately 25 square feet (5x5) surrounding a building support column. Geotextile fabric was placed in the area on November 2, 1990 and a 3-inch layer of QP was spread over the geotextile. A 2-inch covering of asphalt was appiled to the area on November 20, 1990. The NJDEPE inspected this area on December 18, 1990 and accepted the completed work.

Soil Cap Area S-4

This area is known as the A/B Corridor and iles between Buildings A and B. The area is approximately 8,170 square feet (38x215). The corridor was graded using a Hatalils FDS dozer. A vapor trench was excavated, using a Case 580 K backhoe, along the length of the corridor approximately 10.5-feet north of Building A. The trench is 1-foot deep x 2-feet wide x 150-feet long and was fiiled with 1-foot of 3/4-inch washed stone. Three, 4-inch diameter PVC sampilng standpipes were placed at equidistant points along the trench line.

Geotextile fabric was placed over the entire corridor area and 3-inches of QP was placed over the geotextile using a dozer and backhoe. A 2-inch minimum asphalt top was placed over the entire corridor area by Brian Hearth Paving, a subcontractor to G.L. Neviile Constrnction.

Inspection of the asphalt area by the NJDEPE after placement noted 3 soft areas and various small surface cracks in the asphalt in the eastern half of the corridor. G.L. Neviile excavated the 3 soft areas in the asphalt. The excavation showed a 3-inch layer of asphalt over a 3-inch

Soil Cap Area S-8

This area is located under the concrete tank supports along the exterior southwest comer of Building A. The area is approximately 1,470 square feet (21 x 70). Geotextile fabric and a 3-inch cover of QP material was placed over the area. The area was inspected and accepted by the NJDEPE on November 28, 1990.

Soil Cap Area S-9

This is an exterior tank support area along the south wail of Building A of approximately 720 square feet (18 x 40). Brush and debris were removed from the area and geotextile fabric and a 3-inch cover of QP material was placed over area. The completed cap was inspected and accepted by the NJDEPE on November 28, 1990.

Soil Cap Area S-10

This is a triangle shaped area south of Tank 122 of approximately 600 square feet. Geotextile fabric and a 3-inch cover of QP material was placed over the area. The completed cap was inspected and accepted by the NJDEPE on November 28, 1990.

Waste Pile Relocation

The two original waste piles (W1 and W2) contained tar-like material which were identified by the NJDEPE as potential fire hazards. To mitigate this concem, containment of the material was undertaken. Geotextile fabric was placed on the original ground surface near the southeast comer of the "impoundment area" (see Figure 6) and material from waste piles 1 and 2 was relocated and placed on top of the geotextile fabric. Geotextile fabric was again used to cover the waste pile material and QP material was placed over the waste pile as a cap.

2.5 Building Cleaning

Mechanical hand scraping and other eleaning methods were employed to remove gross accumulations of materials from surfaces to be eleaned (walls, floors, piping, tanks, equipment, etc). Final eleaning of surfaces was generaily performed by power washing using a high pressure (10,000 psi) water jet developed from a National Liquid Blaster (NLB) Model 10150 machine. Some surfaces required multiple passes with the NLB foilowed by steam eleaning using 3,500 psi pressure to free remaining visible accumulations of material. Work areas were diked and ail rinsate was coilected for off-site disposal.

Duing the course of the removal and disposal work, three specific staging areas were established for the collection of scrap steel, general trash and debris, and drummed waste material. These areas are shown in Figure 7. The areas were used continuously during the project to accumulate truck load quantities of material and as loading areas for tmcks.

2.5.1 A/B Loading Dock Area

The A/B dock and warehouse (A/B Loading Dock), attached to the east side of Bulldings A and B; was used to store various materials in drums and containers. The area was lttered with trash and debris and contained 1,427 empty 5-gallon cans. These empty cans had identification marks on them as shown in Table 2-3. The cans were similar to those found in Bullding A. In additron, there were two (2), approximately 500 gallon tanks located in the southwest comer of the A/B Loading Dock. These tanks were empty and scrapped and have been ineluded in the Outdoor Tank Contents Summary listed in Table 2-11.

There were 356 drums found in the A/B Loading Dock of which 216 contained product. The drums were scattered throughout the warehouse area. Drums containing product were mostiy 55-gallon capaelty with a small percentage being 16 gallon. The quantity of druns foumd in the A/B Loading Dock are identified in Table 2-4. Drums which were empty, contained trash, or rusted, were crushed and placed in the debris staging area.

TABLE 2-3
A/B LOADING DOCK 5-GALLON CAN INVENTORY
BORNE CHEMICAL COMPANY SITE
ELIZABETH, NEW JERSEY

	Quantity	Identification Marks
	155	Insulating Oll
	8	Electrical Type 1
	64	Hydraulic Huid
	33	10W30
	102	2190 TED
	13	GO 80/90
	1	GO 85/140
	1	OE/HDO 30
	1050	Unmarked
TOTAL	1427	Cans in the A/B Loading Dock

TABLE 2-4
A/B LOADBNG DOCK CONTAINER INVENTORY
BORNE CHEMICAL COMPANY SITE
ELIZABETH, NEW JERSEY

	Quantity	Identification Marks
	270	55 gallon unmarked drums
	32	55 gallon drums identified as sodium sulfate
	1	55 gallon drum identified as ammoniun hydroxide
	24	16 gallon drums identified as Ultralene
	10	16 gallon unmarked drums
	19	Hber drums, unmarked
TOTAL	356	Containers in the A/B Dock and Warehouse

The A/B Loading Dock was the first area at tiie Site from which debris was removed in order to elear the area for the construction of a drum staging area. Debris removal began on September 24, 1990 and continued on September 25, 26 and 28, 1990 and on October 2 and 16, 1990. Front end loaders, Bobcats and hand labor were used to elear debris. A temporary staging area was constructed on October 2, 1990 to centralize all tiie druns found in the warehouse for sampling purposes. These drtims were relocated to the temporary staging aiea on October 3, 1990. Sampling of the A/B Loading Dock drums took place on October 3, 4 and 8, 1990 and January 14 and 15, 1991. These drums were repositioned to Bullding A on October 22, 1990 to make room for the construction of the pennanent staging area. Construction of the staging area began on November 13, 1990 and continued on December 10, 11 and 12, 1990. The staging area was constructed by placing 2 layers of 10-mll polyethylene liner on the warehouse floor and covering the poly with 1/2-inch to 1-inch of sand to protect the poly from damage by drum or equipment impact. A sand bag berm was placed along the perimeter of the staging area to contain leaks and/or spills. On February 1, 1991 the staging area was extended approximately 10-feet to provide more staging area for drums. The entire staging area was reconstructed on April 24, 1991 to ensure its abillty to control any leak.

On December 11, 1990 at approximately 3:30 pm, a Stout equipment operator working around the north wall of the loading dock, hit the wall with a track loader causing the entire 8-foot concrete non-load bearing block wall panel to collapse. There was no apparent structural damage to the adjacent suppoct colunns. The damaged masonry units were collected and placed in the debris plle. Safety fencing was installed around fhe collapsed area. No injuries occurred from the ineldent. Stout secured the wall opening by installing a section of 8-foot high chain link fence with 3 strands of barbed wire on the top at the completion of eleanup activities in the area.

Permanent staging in the A/B Loading Dock area began on December 13, 1990. Bullding A drums were staged on December 14, 1990. Drums from Bullding B were staged on December 17, 18 and 20, 1990. Bullding C staging began on January 21, 1991 and continued on January 22, 23, 24 and 25, 1991 at which tirue the staging area was at capaelty. Approxiruately half of the drums found throughout the bulldings were staged in tiie staging area at this time. As material was removed from drums, more space became available to stage remaining drums from Bullding C. Staging of drums from Bullding C resumed on March 18, 1991 and continued on March 23, 25 and 26, 1991. All druns from all bulldings were staged using a Bobcat or a forkllft.

Drun material removal began on March 20, 1991 and continued on the following dates: March 21 and 22, 1991; Aprll 22, 23, 25, 26, 29 and 30, 1991; and May 2, 1991. Most material was removed from drums using a vacuiim truck. As the 'vac' tmek filled up, its contents were transferred to a NJDEPE llcensed hauler who transported the material to the disposal facility.

Cleaning of tiie dock and warehouse area began on May 21, 1991 when all the druins were removed from the staging area. Clean-up work continued on May 22, 23 and 25, 1991 and on June 3, 1991. This period of eleaning entalled the scraping of the loose material from the dock and warehouse floor. The dock and warehouse areas were power washed on May 28, 29 and 30, 1991 and a steam jenny was used to remove the remaining accumulations on June 4 and 5, 1991.

The NJDEPE made its initial inspection of the dock and warehouse area on June 6, 1991 at which time the Department accepted the area as elean. Access to this area is through elther a north or south gate. The north gate has seal numbers OWD 553708, 553709 and 553710 affixed to it. The south gate has seal number OWD 497987. Both gates require Master lock key number 433 for access.

2.5.2 Building A

Building A is a 3-story process building, knovm as the blending building, where products were mixed and processed. The building contained 53 tanks, 48 of which were 8,000 gallon capaelty hanging tanks, 4 tanks were approximately 660 gallons each and 1 tank was approximately 120 gallons. Figure 3 details the locatron of tanks in Building A. Each tank contained some material ranging from water to thick sludge except for tanks Number 1 and Niunber 52 which were empty.

There were 2,460 empty 5 gallon cans stored in Building A. The cans had identification marks as shown in Table 2-5. These 5 gallon cans were located throughout the building; however, approximately 75% of the cans were stored in the southeast area of the main floor. Larger sized druins were also found throughout the building containing different types of products. These druins ranged from 16 gallons to 55 gallons. Of the 71 drums found in Building A, 50 dnuns contained product. Most drums were approximately one-half full and did not have any discernible identification marks. Table 2-6 summarizes the drums found in Building A.

TABLE 2-5

BUILDING A 5-GALLON CAN INVENTORY

BORNE GHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

	Ouantity	Identification Marks
	1161 cans	GO 80/90
	909 cans	10W30
	184 cans	2190 TEP
	180 cans	Unmarked
	17 cans	Insulating oll
	9 cans	Hydraullc Huid
TOTAL	2460 Cans in Bullding A	

TABLE 2-6

BUILDING A CONTAINER INVENTORY

BORNE CHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

	Ouantity	Identification Marks
	55	55 gallon unmarked drums
	4	55 gallon drum witin Lubrizol identification
	3	55 gallon drums with BP Energol identification
	2	55 gallon drums with Adhesive identification
TOTAL	64	55 gallon drums
	3	25 gallon unmarked drums
	4	16 gallon drums with Ultralene identification
TOTAL	71	Containers in Bullding A

The entire building was ilttered with debris and trash. Spilled product deposits were found covering all floor areas and some wall areas. A "soft" asphalt area was found in tine east half of the main floor of the building. The area measures approximately 10,000 square feet. A "hard" asphalt area was located in the southeast main floor area. It measures approximately 2,800 square feet. A new asphalt cap was installed within the soft asphalt area along the west end of the existing asphalt area to cover an exposed black, stained soil area for fire retardation purposes. It measures approximately 429 square feet. These locations are noted on Figure 7.

The soft asphalt area was a eleaning problem in that after power washing tine area, the NJDEPE determined that a very thin material deposit remained on the asphalt surface. The area had been scrapped with Bobcat buckets and brushes and pressure washed a number of times. Speedy dry was spread over the area to try and draw the material to the surface; however, no incremental benefit was gained by any approach. The NJDEPE inspected the asphalt area on January 10, 1991 at which tlme the area was considered unacceptable because of the thin residue layer on the asphalt surface. The NJDEPE retumed on February 28, 1991 to witness the power washing of the area using up to approximately 8,000 psi water pressure. At this pressure the asphalt was beginning to disintegrate. Following tine power wash demonstration, the NJDEPE accepted this asphalt area as elean in that no incremental benefit could be gained by additional washing.

Sampling of Building A began with the large hanging tanks on September 26, 1990 and continued on September 27 and 28, 1990. A temporary staging area for Building A drums was constmcted in the southeast comer of the building on October 4, 1990 and drums were immediately staged for sampling. Drum sampling took place on October 9 and 11, 1990. All drums were permanentiy staged in the A/B Loading Dock on January 9, 1991.

Debris removal from Building A began on October 1, 1990. All debris material was placed in the debris staging area with the use of Bobcats and a front end loader. Debris removal continued on October 2, 3, 4, 5, 8 and 10, 1990. Power washing of the floor, walls and tanks began on November 28 and continued on November 29 and 30, 1990; December 3, 4, 5, 10, 11, 12, 13, 19 and 26, 1990; January 28, 1991; February 8, 1991; March 1, 7, 15, 16, 18, 21, 25 and 26, 1991. The floor was eleaned with hand-scrapers and Bobcats prior to power washing the floor in order to remove as much loose' material as possible to make power washing more effective. Certain areas of the floor in Building A were capped with concrete due to their re-occurring eleaning problems. See Figure 7 for these locations.

Tank material removal and cleaning of Building A began on January 16, 1991 and continued on January 17, 1991; February 1, 4, 5, 6, 7, 8, 11, 12, 13, 14, 25, 26, 27 and 28, 1991; March 5, 6 and 26, 1991. The majority of tanks in Building A were below 1 percent capaclty (approximatcly 50 gailons per tank). Material was removed from the tanks by draining the tank contents into 55-gailon drums and pumping this material into a 5500 gailon storage tanker positioned on the west side of the building. A NJDEPE licensed transportation company then transported the material to Giant Cement Company in South Carolina for disposal. Tank elean-outs entailed the hand removal of remaining material by bucket, washing of the tank interiors with diescl and water (steam) blasting of tank interiors and exteriors. Ail interior connecting pipe was removed from the building on March 11, 12, 13 and 14, 1991 using electric saws to dismantie the piping. It was found to be more efficlent to dismantie the several thousand feet of building transfer piping, clean the pipe outside of the building and scrap it, rather then clean it in place. Building A pipe was staged on the west side of the building between the concrete tank supports. A staging area was constructed with poly and a sand berm was placed to contain any leaking pipe contents. Piping was subsequentiy eleaned and scrapped.

The NJDEPE made its initial Building A inspection on March 19, 1991 at which time a tank deaning punch list was generated for tanks within tiie building. The second inspection took place on March 22, 1991 and resulted in the approval of ail tanks within Building A. A minor punch list for the main floor level was generated. The NJDEPE returned on March 28, 1991 and found Building A to be acceptable as clean.

Building A has two operable access points; one located on the west side of the building across from Building E and the other on the south side of the building. The west door has seal number OWD 553787 affixed to it while tiie south door has seal number OWD 553784 affixed to it. Master lock key number 433 is required for both doors.

At approximatcly 2:00 PM on Ortober 9, 1990, Stout personncl were clearing debris between the concrete cradles holding Tanks 116, 117 and 118. These tanks are located on the exterior southwest side of Building A. While moving debris, the backhoe operator hit a compressed gas cylinder covered within the debris. The cylinder ended up on its side, opening the valve and releasing what smeiled to be propane. The area was cleared of ail personncl. Stout's Health and Safety Officer recorded HNu readings of approximatcly 100 ppm. The Elizabeth Hre Department was cailed to the site at 2:30 p.m. They arrived at 2:40 p.m. Using Self Contained Breathing Apparatus, the fire department investigated the leaking cylinder and it was determined to be propane. They closed the valve to the cylinder to stop the propane leak. The Elizabeth Hre Department was off-site at approximatcly 3:30 p.m. A representative from

Elizabethtown Gas Company was called on site by the fire department and arrived at approximatciy 3:00 p.m. He proceeded to check the cylinder for further leaks and found none. The propane cylinder was then secured inside Building E. No injuries occurred as a result of the leak.

2.5.3 Building M

Building M is a two-story building which was used as a storage area for equipment. The building contained debris such as fiber drums, empty one quact containers, adhesive stickers, metal signs, printing dyes and paper. No hazardous or non-hazardous ilquids were found. There is one access door for each floor.

Debris removal began on October 1, 1990 and continued on the foilowing dates: November 1, 9, 12, 13 and 14, 1990 and on February 19, 1991. Ail debris was placed in the debris staging area and recyclable metal was power washed and transported to the scrapper. The building was pressure washed on February 20 and 21, 1991.

The NJDEPE made its first inspection of Building M on February 28, 1991 and gave the building a conditional acceptance due to a few building security deficiencies. These deficiencies were corrected for the second NJDEPE inspection on March 28, 1991 at which time the NJDEPE accepted Building M.

The access door for the first floor is located on the south side of the building and has seal number OWD 553785 affixed to it. Seal number OWD 553790 is affixed to the second floor access door which is located on the east side of the building. Master lock key number 478 is required to access both doors.

2.5.4 Building B

Building B is a 4-story building which was known as the grease building. The building contained 56 tanks, mostiy hanging tanks of 8,000 gailon capacity. Figure 4 details the location of tanks and zones in Building B. Each tank contained some material ranging from water and thick sludge to soild magnesium oxide, except for 7 tanks which were empty. There were 343 drums with product located vcithin the 1st, 2nd and 3rd floors of the building. No drums were found on the 4th floor. Table 2-7 shows tne quantity, identification and location of drums found by floor and by zone within Building B.

TABLE 2-7
BUILDING B CONTAINER INVENTORY
BORNE CHEMICAL COMPANY SITE
ELIZABETH, NEW JERSEY

Floor	Quantity	Identification Marks
1	107-55 gallon	Sodium Sulfate
	45-55 gallon	Unmarked
	20-16 gallon	Unmarked
2	86-55 gallon	Unmarked
	8-16 gallon	Unmarked
	13-30 gallon	Unmarked
3	53-55 gallon	Unmarked
	11-16 gallon	Unmarked
TOTAL	343 Drums	

Floor	Zone	Quantity
1	BIA	50
	BIB	27
	BIC	95
2	B2A	51
	B2B	20
	B2C	36
3	B3A	11
	B3B	23
	B3C	30
	TOTAL	343

Ail building floors were covered witii a combination of spiiled product and dict to a thickness of approximatcly 1 inch. Trash and debris were foumd on the 2nd and 3rd floors. The first floor was used to temporarily stage many of the drums found in the building.

Sampling of tanks in Building B began on September 24, 1990 and continued on September 25 and 26, 1990. A temporary drum staging area was constructed on tiie 1st floor on October 16, 1990. Drum sampling began on November 5, 1990 and continued on November 6, 7, 8, 13, 14 and 15, 1990 and on December 5, 1990. Druns were repositioned to the A/B drum staging area on December 17, 18, 19 and 20, 1990.

Debris and trash removal from Building B began on the 1st floor on October 8, 1990. Building cleaning was conducted on a floor by floor basis, begirning with the 1st floor and ending with the 4th floor. Ail debris and trash from the building was placed in the debris staging area. Debris and trash removal continued on October 9, 10, 11, 12, 15, 16, 17, 19, 22, 23, 25, 29 and 30, 1990; January 10, 22, 23, 24, 25, 28 and 29, 1991 and on February 1, 6 and 7, 1991. Window and wail knockouts on the 2nd and 3rd floors allowed debris to be removed from the building. Debris was removed using a front end loader positioned on the north side of the building to coilect the debris and transpoct it to the staging area. Once debris and scrapings were removed, power washing began on December 20, 1990 and continued on December 27 and 31, 1990; January 2, 3, 7, 15, 16, 17, 18, 21, 28, 29, 30 and 31, 1991; February 4, 7 and 13, 1991; March 26, 27 and 28, 1991; and on April 2, 4, 8, 14, 15, 16, 18, 19, 22 and 23, 1991. Power washing of the floors and walls removed approximatcly 90% of the visible accumulations. A steam jenny was used to remove the remaining material. The steam jemy was used in Building B on the foilowing dates: March 29, 1991; April 2, 3, 5, 15, 16, 22, 23, 24, 26, 27, 29 and 30, 1991.

Tank material removal and cleanouts began on March 6, 1991 and continued on March 7, 8, 13, 15, 16, 18, 19, 20, 21, 22, 23, 25, 27, 28 and 29, 1991 and on April 1 and 5, 1991. Material was removed by draining tanks into 55 gailon drums and transferring the material from the drums to a 5500 gailon storage tanker positioned on the north side of the building. A double-diaphragm pump was used to transfer the material from druns to the tanker. Tanks were cleaned by diescl wiping the tank interiors and exteriors and using a steam jenny to remove any remaining visible accumulations. The steam jenny was also used to remove accumulations from floors and walls. There were six (6) tanks in Building B which caused problems during the tank clean-out operation. Tanks 100, 102, 103 and 105 contained soildified magnesium oxide (MgO). Tanks 102, 103 and 105 contained relativcly smail amounts of MgO and were cleaned using air chisels to break up the material. Tank 100 contained approximatcly 7 inches of soild MgO. This tank was cleaned to the top layer of MgO and left as is after TCLP testing

showed the material to be non-hazardous. Tanks 84 and 85 contained soild "rubber-like" material. A hole was cut in each tank bottom to push (shovel) the material tirough tire access and into drums. Air chisels and scrapers were used to remove fhe remaining material from these tanks.

Interior building pipes were removed in ileu of cleaning in-place on March 19, 20 and 21, 1991. The pipe was staged on the north side of Building B in a temporary pipe staging area. Pipe was cleaned prior to scrapping.

Torch work was approved on April 8, 1991 to remove scrap stecl from the 2nd and 3rd floors. The scrap stecl was cleaned in place by power washing prior to removal. Scrap stecl removal from the 2nd and 3rd floors took place on April 8, 9, 11, 12 and 15, 1991. Ail scrap stecl was removed from the building to the scrap staging area.

The NJDEPE made its initial inspection of Building B on March 28, 1991 at which time the building was not ready for fuil or partial inspection. The NJDEPE retumed on April 2, 1991 and approved 2 tanks on the 4th floor. The third NJDEPE inspection took place on April 17, 1991. The inspection produced 18 acceptable tanks on the 4th floor and a smail punch list for the remaining tanks. The fourth NJDEPE inspection occurred on April 25, 1991. The 3rd and 4th floor tanks, floors and walls were accepted by the NJDEPE. The 2nd floor was accepted as clean on May 1, 1991 and the 1st floor was accepted on May 8, 1991. Ail openings in the building walls created by the clean-up process were covered and secured with plywood. Window frames which were knocked out during the clean-up were also secured with plywood.

The operable access door to Building B is located on the north side of the building and has seal number OWD 553691 affixed to it. Master lock key number 433 is required for access.

2.5.5 Building C

Building C is one-story warehouse type building with a soild concrete floor which contained 570 drums of various unknovm chemicals and products. There were four horizontal tanks located in the east end of the building. These tanks contained a metailic "rust-like", a "rubber-like" material and water/petroleum hydrocarbon mixtures. There were also 4 circular mixing tanks located in the center area of the building and 2 tanks were next to a filter press in the southeast end of the building. Figure 5 details the location of tanks in Building C. The west end of the building was used to store diatomaceous earth in paper sacks.

Sampling work in Building C began on October 11, 1990 with the identification and numbering of drums. Drum samples for fingerprint analysis were taken on the foilowing dates: October 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 30 and 31 1990; November 1, 1990 and December 10, 1990. Ail sampling of drums was performed in Levcl B PPE. Tank sampling took place on December 16, 1990. Tanks 106, 107, 108 and 109 were tiie only tanks which contained material.

Work in Building C began on October 8, 1990 with the construction of a temporary drum staging area. The construction of the temporary staging area was completed on October 9, 1990. During these two days, ail drums witiin Building C were staged on 10-mil poly. The staging area extended the entire length of the building.

Once the analytical results were rcleased by the off-Site laboratory, the permanent staging of the drums from Building C began in the A/B Loading Dock. The staging process took place on the foilowing dates: January 21, 22, 23, 24 and 25, 1991 and also on March 8, 23, 25 and 26, 1991. The reason for the gap between staging periods was the overloading of the drum staging area in the A/B Loading Dock which is discussed in Section 2.3.1.

Tank clean-out began on January 23, 1991 with the construction of a tank cleaning area around the horizontal tanks at the east end of the building and took place on the foilowing dates: January 24, 25, 30 and 31, 1991; February 1, 5, 6 and 7, 1991; March 27 and 29, 1991; April 1, 4, 5 and 8, 1991. Tanks 106, 107, 108 and 109 were the only tanks in Building C which required material removal. Ail tank contents were found to be non-hazardous. Tank 106 contained a rubber-like material which could not be pumped. The east end of the tank was cut open to access the material. The material was cut using an air hammer and a pick to break the material so it could be shovcled into drums for placement in the debris staging pile. Tank 107 contained metailic rust-like material which was coilected in buckets and placed in drums for tiranspoct to the debris staging area. Tank 108 contained a water/product mixture which was vacuumed into 6 drums for disposal. Tank 109 contained a hard, thick, silppery material which was removed directiy to the debris staging area. The horizontal tanks and remaining tanks in Building C were cleaned on April 5, 1991 and moved outdoors to allow continued building cleaning. The NJDEPE inspected these tanks on April 11, 1991 and approved them for scrapping.

Building cleaning began on October 8, 1990 with the removal of debris from the building. Ail debris was placed in the debris staging area. The cleaning process continued on the foilowing dates: October 23, 1990; February 1, 4 and 6, 1991; March 28, 1991; April 3, 4, 8, 9, 10, 11, 12, 15 and 16 1991. The clean-up of the building entailed the scraping of the floors to remove the

spiiled product and dict residue. This was accoinplished using hand scrapers, a Bobcat bucket and a backhoe bucket. The building was then power washed with a NLB and remaining 'dirty' spots were cleaned with the use of a steam jemy.

The north floor on the east end of the building had a tacky material residue which could not be removed with a NLB or a steam jenny. The NJDEPE witnessed several cleaning attempts of this area and agreed the area could not be cleaned to further incremental benefit. A granular absorbant material (speedy-dry) was spread over this area and left in place to absorb exudate from this residue.

A number of smail concrete caps were instailed through-out the building covering earthen areas and/or areas which could not be sufficlentiy cleaned and were considered a potential fire hazard. See Figure 7 for locations.

The first NJDEPE inspection occurred on April 11, 1991 at which time a smail punch ilst was generated for the removal of remaining accumulations. The NJDEPE returned on April 17, 1991 to re-inspect the building and accepted it as clean.

There are three access doors to Building C. One is located on the east end of the building and has seal number OWD 553716 affixed to it; a north central door which has seal number OWD 553786 and a northwest door which has seal nrunber OWD 553737 affixed to it. Master lock key number 433 wiil open ail locks to access doors for Building C.

The east garage area of Building C was used to stage a speclal drum opening operation for drums A/B 17A, A/B 206, C017 and C018 which could not be opened for fingerprint and sample extraction by conventional means. This staging area was constrncted on January 9, 1991 and consisted of a poly base with approximatcly 3-inches of sand cover placed over the poly in the garage area. A sand bag berm was formed on the perimeter of the staging area to coilect any spill material from the drum opening. A backhoe was rigged with a non-sparking 'punch' to pierce the drums. The 'punch' opening took place on January 10, 1991. The NJDEPE was present to witness each drum successfuily opened without incldent. The punch area was designated as levcl B PPE. Readings prior to, during and after the opening where 0.0 on both the HNu and OVM used to sample the work area.

2.5.6 Building D

Building D was known as the Old Boiler Room. This building was used as a storage shed for equipment and hoses. There were 16 drums of unknovm material located in the building.

Sampling of the drums took place on Noveinber 15, 1990. Ail druns were sampled using drum thieves. The samples were fingerprinted at the on-Site laboratory and then sent to a certified off-Site laboratory for further analysis.

The building was cleared of debris on October 29, 30, 31, 1990 and of drums on December 13, 1990. Debris was placed in the debris staging area and tiie druns were temporarily re-located to Building E. The area was then power washed and cleaned on December 15, 1990. Rinsate was coilected and vacuumed into a 5,000 gailon vacuum truck for later off-Site disposal.

The NJDEPE approved Building D as clean on January 29, 1991. Access to the building is through the east silding door which has seal nunber OWD 553695 attached to it. The west door has seal number OWD 497853 attached to it. Master lock key number 433 is required to access the building.

2.5.7 Building E

Building E was known as the New Boiler Room. This building was clear of debris which had been removed during the asbestos abatement work in May of 1990. The building had heavy spiiled product and fucl deposits on the concrete floor and in the floor trench which was located on the north, south and west sides of the building. No drums or tanks were found in the building.

Clean-up of the building began on October 29, 1990 and continued on the foilowing dates: October 30 and 31, 1990; November 1, 5, 6 and 7, 1990; December 17, 1990 (power washed) and January 28, 1991. During the clean-up of the floor trench, 33 drums of product and debris were generated. These druns were sampled on January 3 and 17, 1991. The clean-up was accomplished using shovels and scrapers to clean the floor and wail areas, and a Bobcat bucket to clean the trench which contained approximatcly 4-inches of material. The floor trench walls were heavily stained and susceptible to groundwater filtration. Material generated from the clean-up of Building E was placed on the debris staging area after laboratory results were retuned verifying it was not land disposal restricted material.

The NJDEPE made its first inspection of Building E on January 29, 1991 at which time furtiier cleaning of the floor trench was required. On February 19, 1991 the floor trench was power washed at a pressure of 8,000 psi. The foilowing days, February 20 and 21, 1991 were used to scrape the remaining residue from the side wails. The second NJDEPE inspection of Building E occurred on February 28, 1991 and again the floor trench wails were not acceptable. At this time it was decided to use the steam jenny in the floor trench. The trench was 'steamed' on

March 27, 1991. The NJDEPE re-inspected the trench on March 28, 1991 and found it to be clean. Access to Building E is through the east door and has seal number OWD 553789 affixed to it. The west door of Building E has seal number OWD 553761 attached to it. Master lock key number 433 is required to access the building.

2.5.8 Laboratory (Building G)

The laboratory building is a two-story building which contained offices, storage areas and lab equipment. The building was cluttered with debris including a dog house and a motorcycle. It also contained four compressed gas cylinders and laboratory chemicals stored in plastic and glass containers. There was one half-fuil 55-gailon drum found in the building which contained an unknovm product mixture. Ail remaining product sample containers were bulked into this drum and five other 55-gailon drums on November 30, 1990 and December 3, 1990 after fingerprint results from lab-pack sampling on November 26, 1990 showed the materials to be compatible. The remaining material was lab-packed on February 11, 12 and 13, 1991.

Debris removal from the Laboratory Building began on February 28, 1991 and continued on March 1 and 4, 1991. Ail debris from the building was placed in the debris staging area for disposaL The building was steam cleaned on March 5, 1991.

Gas cylinder removal was completed on March 8, 1991. Owners of the gas cylinders were identified by their markings on the respective cylinder and each ovmer was contacted to remove their cylinder(s). Receipts from each suppiler were obtained and are included with this repoct (see Appendix A). Table 2-8 summarizes this activity. The remaining unidentified gas cylinder in the laboratory building and the propane cylinders found in Building E and the area west of Building A, were disposed of.

Inspection of the laboratory building took place on March 28, 1991 with conditional approval of the building given due to the packaged lab-packs contained within the building. The lab-packs were transpocted off-Site on May 29, 1991 at which time the NJDEPE accepted the laboratory building as clean. The east door to the building has seal number OWD 553772 affixed to it and the south door has seal number OWD 553782 affixed to it. Master lock key number 433 wiil open the south door.

TABLE 2-8

GAS CYLINDER REMOVAL

BORNE CHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

Gas Cylinder Type	Owner	Pick-up Date
Oxygen	Linde Gases of the Mid Atiantic 5 Iron Horse Road Oakland, NJ 07436 (201) 337-7003	3/7/91
Carbon Dioxide	Koch Carbonic Corporation 433 Raymond Boulevard Newark, NJ 07105 (201) 344-8070	3/8/91
Nitious Oxide	Air Products & Chemicals, Inc. 1680 Oak Road P.O. Box 170 Iselin, NJ 08830 (908) 548-4600	3/8/91
Nitrogen	Air Products & Chemicals, Inc. 1680 Oak Road P.O. Box 170 Iselin, NJ 08830 (908) 548-4600	3/8/91

Retained documents from the office building, including asbestos tainted files collected during the asbestos abatement work, are stored on the second floor in the southeast room of the laboratory building. The documents were placed in a sealed closet which has seal number OWD 553783 affixed to it. Master lock key number 433 is required to access these records.

The fifth cylinder in the lab building was an oxygen cylinder. This cylinder was transported to Rollins, NJ for disposal along with the propane cylinder found between the tank saddles west of Building A.

The NJDEPE inspected the building on March 28, 1991 and found the building to be cleaned in an acceptable manner. The foilowing seal numbers were affixed to the Laboratory Building:

Location	Seal Number
Record Room 2nd Floor	OWD 553783
South access door	OWD 553782
East access door	OWD 553772

2.5.9 Office Building

The first floor of the office building was generaily free of debris. Most records were kept in the northeast area of the first floor. These records included stock certificates, letters to and from Bome and general office suppiles. The second floor of the office building was ilttered with paper debris in most offices. The worst area was the main office (southeast section) where desks, chafrs, recording equipment and documents were scattered throughout the area. Documents were separated according to the NJDEPE mandated procedure as stated in Mr. John Reneila's letter to the Group, dated March 13, 1991 (See Appendix A). The documents identified for retention were placed in large plastic bags and stored in the Laboratory Building along with other documents collected during the asbestos abatement work which had preceded this project. Ail documents were removed to the second floor, southeast comer office of the Laboratory Building.

Duuing clean-up operations on December 18, 1990, personncl working in the northeast office on the second floor, knocked dovm the wail separating the office from the stairweil. The condition of the office building roof, especlaily on the north side of the building has badly deteriorated to the point where large holes in the ceiling ailow rain to fail into this area of the building. As a result, many of the plaster wails are water saturated and very weak. Caution must be used when walking near this area of the building. The north entrance to the office building is accessible; however, the stairweil has been marked with yeilow caution tape to deter traffic

through this area of the building. The rubble from the wail collapse has been left in place because of the potential danger associated with cleaning the area.

Debris was transported from the building to the debris pile using a backhoe. The backhoe was loaded by hand. Any material product found in the office building was rclocated to the lab building for sampling and lab packing.

The NJDEPE approved the office building as clean on May 8, 1991. Access to the building is through the north door. Seal number OWD553694 is attached to the door lock which was placed on June 3, 1991. Master lock key number 433 is required for entry. The south door to the office building has seal number OWD 553724 affixed to it.

2.5.10 Building F

Building F was known as the Machine Shop. It contained general maintenance equipment, shelves and smail amounts of packaged product. The concrete floor of the building was covered with approximatcly 2-inches of spilled product and dict. No drums were found in this building.

Clean-up of Building F began on February 18, 1991. Debris was removed to the debris staging area and the floors were swept. The building floor and wails were power washed on February 20, 1991. The NJDEPE accepted Building F as clean on February 28, 1991. Access to the building is through the west door which has seal number OWD 553764 attached to it. Master lock key number 433 is required for building access.

2.5.11 Building H

Building H was knovm as the Pump House. It contained very ilttle debris, but the concrete floor was covered with spilled product and dirt. The north wail of the building was perforated with pipe which at one time was connected to five pumps. These pumps had been removed prior to the clean-up and only the distribution pipe manifold remained.

Debris was removed from the building on February 18, 1991 and placed in the debris staging area. During the debris removal, the west door was knocked off its hinges. The building floor and walls were pressure washed on February 20, 1991.

Inspection of Building H took place on February 28, 1991 with conditional approval of the building given due to the lack of building security (door) on the west side of the building.

Final approval for building cleanliness and building security was given by the NJDEPE on March 19, 1991. The west door was secured using plywood and supports leaving the south door as the only access to the building. Seal number OWD 553791 is attached to this access door and Master lock key number 433 is required to enter the building.

2.6 Tank Farm Area

There were 23 tanks of variable sizes located within the tank farm containing approximately 500,000 gallons of material, much of which was divided into multi-phases of non-aqueous, aqueous and sludge. One sample of material was taken for each phase within each tank. Of the 23 tanks in the tank farm, 13 tanks had multi-phases and 3 tanks were empty when sampled. The remaining 7 tanks were single-phase. Sampling was conducted according to Stout's Sampling and Waste Characterization Plan approved by the NJDEPE on September 4, 1990.

Tank contents ranged from pumpable water to non-pumpable sludge and solids. Volume measurement of tank phases was difficult to ascertain due to the various phase contents and differing phase densities within a single tank. Initial estimates of tank volumes by phase were made to obtain a better understanding of the type and volume of material; in respective tanks however, problem phases and actual volume measurements could not be properly defined until the particular phase was uncovered. Tank 125 contained a thick-sludge mixed with trash and debris such as 5 gallon buckets, rags, pencils, pens and tyveks. Tank 123 contained approximately 3-feet of magnesium oxide with a 3-inch non-aqueous layer on top. Tank 145 contained a semi-solid material which was neither a true solid nor pumpable. The remaining tanks with product contained a mixture of aqueous material, non-aqueous material and sludge. Table 2-9 identifies the volume removed from each tank by phase and its respective disposal facility. Table 2-10 is a cross-reference listing of the tanks to their respective manifest number, disposal facility and waste code. A copy of this table is included in Volume XI.

Tank 128 contained 2-phases consisting of a PCB contaminated aqueous mixture and a PCB contaminated sludge. This material had to be handled separately due to the presence of PCB's greater than 50 parts per million (ppm). The original disposal matrix had planned to dispose of this material at the SCA incinerator in Illinois; however, this facility was shut down in Mid-February, 1991 due to an explosion in the kiln. The resulting loss of national incineration capacity for PCB regulated wastes created a situation where demand for disposal capacity greatly exceeded the supply.

TABLE 2-9

TANK FARM CONTENTS SUMMARY

BORNE CHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

Tank #	Pounds Removed	Disposal Facility
123-1	10,053	OMNI
123-2	48,222	OMNI
124-1	EMPTY, small solids	GSX
125-1	75,380	GIANT
125-2	88,285	GIANT
125-2	154,293	OMNI
126-1	45,502	GIANT
126-2	45,736	ENSCO
126-3	341,200	CMI
126-3	129,103	OMNI
126-4	564,960	OMNI
127-1	7,614	ENSCO
127-2	117,594	DUPONT
127-3	16,239	GIANT
127-3	738,836	GSX
127-3	77,613	OMNI
128-1	81,849 (PCB)	ENSCO
128-2	41,589 (PCB)	ENSCO
128-2	538,973 (PCB)	ROLLINS
129-1	42,720	GIANT
129-2	106,400	CMI
129-3	20,020	ENSCO
129-3	48,520	OMNI
130-1	29,979	GIANT
130-2	255,053	ENSCO
130-2	27,103	OMNI
131-1	54,935 (H)	DUPONT
131-2	650,620	GSX
132-1	14,818	GIANT
132-2	119,725 (H)	DUPONT
132-2	6,858	GIANT
132-3	157,640	GSX
133-1	29,718	DUPONT
133-2	2,250	GIANT
134-1	12,917	GIANT
134-2	364,190	GSX
135-1	5,421	DUPONT
136-1	37,670	ENSCO
136-2	295,786	ENSCO

TABLE 2-9 (Continued)
TANK FARM CONTENTS SUMMARY
BORNE CHEMICAL COMPANY SITE
ELIZABETH, NEW JERSEY

Tank #	Pounds Removed	Disposal Facility
136-2	221,000	OMNI
136-3	93,923	OMNI
137-1	32,026	DUPONT
137-2	411,070	GSX
138-1	13,594	DUPONT
139-1	5,486	DUPONT
139-2	2,250	GIANT
140-1	65,145	GIANT
141-1	36,612	DUPONT
142-1	EMPTY	–
143-1	95,835	DUPONT
144-1	EMPTY	–
145-1	2,961	DUPONT
145-2	476,940	GSX
TOTAL	6,862,226	

TABLE 2 - 10
TANK MATERIAL TRACKING SUMMARY
TANK MATERIAL WAS TRANSPORTED UNDER THE MANIFEST DOCUMENT NUMBER ASSOCIATED WITH THE FOLLOWING TANK NUMBER AND PHASE.

TANK NO.	MANIFEST NUMBER AND DISPOSAL FACILITY	WASTE CODES FOR MATERIAL*
BDLG A TANKS (All Giant Cement)	91046, 91051, 91064, 91073, 91076, 91080	X722, Non-Hazardous
BLDG B TANKS (All Giant Cement)	91121, 91052, 91047	X722, Non-Hazardous
BLDG C TANKS		
(Debris, GSX)	91095, 91096, 91097, 91098	X725, Non-Regulated Material
(Oil, Giant)	91121	X722
123- 1 2	91215 (OMNI), 91254 (OMNI), 91257 (OMNI), 91262 (OMNI), 91262 (OMNI), 91264 (OMNI), 91265 (OMNI), 91278 (OMNI) 91279 (OMNI)	X725, D018, D036, D039 D040, F001
124- 1	EMPTY	–
125- 1 2	91037 (Giant), 91039 (Giant) 91041 (Giant), 91042 (Giant), 91045 (Giant), 91132 (Giant), 91181 (OMNI), 91198 (OMNI), 91206 (OMNI), 91215 (OMNI), 91234 (OMNI), 91238 (OMNI), 91248 (OMNI), 91250 (OMNI), 91254 (OMNI), 91257 (OMNI)	X722, F001, X722, D018,D036, D039, D040, F001, F005
126- 1 2 3	91042 (Giant), 91043 (Giant), 91062 (Ensco), 91065 (Ensco), 91058 (CMI), 91061 (CMI), 91063 (CMI), 91066 (CMI), 91072 (CMI), 91081 (CMI), 91083 (CMI), 91094 (CMI), 91099 (CMI), 91101 (CMI), 91304 (OMNI), 91306 (OMNI), 91309 (OMNI), 91311 (OMNI)	X722, D005, D018, D036, D039, D040, F001, F005 X722, D005, F001, F005 X722, D00S, D028, D038, D039, F001, F004, F005
4	91313 (OMNI), 91314 (OMNI), 91315 (OMNI), 91317 (OMNI), 91318 (OMNI), 91319 (OMNI), 91325 (OMNI), 91330 (OMNI), 91332 (OMNI), 91333 (OMNI), 91336 (OMNI), 91337 (OMNI), 91338 (OMNI), 91339 (OMNI), 91340 (OMNI), 91341 (OMNI), 91342 (OMNI), 91343 (OMNI)	X722, D005, F001, F005

TABLE 2 - 10 (Continued)
TANK MATERIAL TRACKING SUMMARY

TANK MATERIAL WAS TRANSPORTED UNDER THE MANIFEST DOCUMENT NUMBER ASSOCIATED WITH THE FOLLOWING TANK NUMBER AND PHASE.

TANK NO.	MANIFEST NUMBER AND DISPOSAL FACILITY	WASTE CODES FOR MATERIAL*
126-4	91344 (OMNI), 91345 (OMNI), 91346 (OMNI), 91347 (OMNI), 91348 (OMNI), 91349 (OMNI), 91351 (OMNI), 91352 (OMNI), 91353 (OMNI), 91354 (OMNI)	X722, D005, F001, F005
127- 1	91038 (Ensco)**	X722, D005
2	91030 (DuPont)**	X722, D00S
3	91045 (Giant), 91047 (Giant), 91225 (OMNI), 91226 (OMNI), 91251 (GSX), 91252 (GSX), 91253 (GSX), 91255 (GSX), 91258 (GSX), 91259 (GSX), 91260 (GSX), 91261 (GSX), 91266 (GSX), 91267 (GSX), 91268 (GSX), 91269 (GSX), 91272 (GSX), 91273 (GSX), 91274 (GSX), 91275 (GSX), 91276 (GSX), 91291 (GSX), 91292 (GSX),	X725, X722, D005, D018, D036, D039, D040
128- 1	91033 (Ensco), 91034 (Ensco)	X750, F001
2	91060 (Ensco), 91355 (Ensco) 91277 (Rollins, TX), 91284 (Rollins TX), 91285 (Rollins, TX), 91286 (Rollins, TX), 91287 (Rollins, TX), 91288 (Rollins, TX), 91289 (Rollins, TX)**, 91290 (Rollins, TX), 91294 (Rollins, TX)**, 91295 (Rollins, TX)**, 91305 (Rollins, TX), 91308 (Rollins, TX), 91316 (Rollins, TX), 91350 (Rollins, TX) 91357 (Rollins, TX), 24638 (Rollins, TX), 24639 (Rollins, TX), 24640 (Rollins, TX), 24641 (Rollins, TX)	X722, D00S, D018, D022, D036, D039, D040, F001, F004, F005, PCB
129- 1	91044 (Giant)	X722, D018, D022, D039, D040, F001, F005
2	91055 (CMI), 91056 (CMI), 91058 (CMI)	X722, D00S, D018, D022, F001, F005
3	91059 (Ensco), 91270 (OMNI), 91271 (OMNI), 91280 (OMNI), 91281 (OMNI)	X722, D00S, D018, D022, F001, F005
130- 1	91064 (Giant)**, 91073 (Giant)**, 91076 (Giant)**, 91080 (Giant)**	X722, D005, D031, F004, F005
2	91038 (Ensco), 91040 (Ensco), 91048 (Ensco), 91050 (Ensco), 91054 (Ensco), 91059 (Ensco), 91065 (Ensco), 91307 (OMNI), 91309 (OMNI)	X722, D00S, D028, D038 D039, F001, F004, F005

TABLE 2 - 10 (Continued)
TANK MATERIAL TRACKING SUMMARY

TANK MATERIAL WAS TRANSPORTED UNDER THE MANIFEST DOCUMENT NUMBER ASSOCIATED WITH THE FOLLOWING TANK NUMBER AND PHASE.

TANK NO.	MANIFEST NUMBER AND DISPOSAL FACILITY	WASTE CODES FOR MATERIAL*
131- 1	91023 (DuPont), 91026 (DuPont)	X72S, D00S
2	91208 (GSX), 91210 (GSX), 91211 (GSX), 91213 (GSX), 91214 (GSX), 91217 (GSX), 91222 (GSX), 91227 (GSX), 91239 (GSX), 91241 (GSX), 91242 (GSX), 91244 (GSX), 91245 (GSX), 91246 (GSX)	
132- 1	91049 (Giant)	X722, Non-Hazardous
2	91025 (Giant), 91026 (DuPont), 91027 (DuPont), 91029 (DuPont), 91030 (DuPont)	X722, D005
3	91135 (GSX), 91136 (GSX), 91137 (GSX), 91138 (GSX)	X725, D00S, D018, D039 D040
133- 1	90022 (DuPont)	X722, Non-Hazardous
2	91052 (Giant)	X722, Non-Hazardous
134- 1	91049 (Giant), 91051 (Giant)	X722, Non-Hazardous
2	91138 (GSX), 91144 (GSX), 91147 (GSX), 91148 (GSX), 91149 (GSX), 91163 (GSX), 91164 (GSX), 91165 (GSX), 91170 (GSX), 91171 (GSX), 91172 (GSX), 91201 (GSX), 91202 (GSX),	X722, X725, D00S, D018, D019, D022, D039, D040
135- 1	91024 (DuPont)**	X722, Non-Hazardous
136- 1	91035 (Ensco)	X722, D00S, D039, F001, F005
2	91143 (Ensco), 91145 (Ensco), 91153 (Ensco), 91162 (Ensco), 91168 (Ensco), 91178 (Ensco), 91187 (Ensco), 91263 (OMNI), 91297 (OMNI), 91298 (OMNI), 91300 (OMNI), 91301 (OMNI), 91302 (OMNI),	X722, D001, D00S, D039, D040, F001, F005
3	91307 (OMNI), 91309 (OMNI), 91310 (OMNI), 91312 (OMNI)	X722, D00S, D028, D038, D039, F001, F004, F005
137- 1	91024 (DuPont)**	X722, Non-Hazardous
2	91163 (GSX), 91164 (GSX),	X725, D00S, D018, D019,

TABLE 2 - 10 (Continued)
TANK MATERIAL TRACKING SUMMARY

TANK MATERIAL WAS TRANSPORTED UNDER THE MANIFEST DOCUMENT NUMBER ASSOCIATED WITH THE FOLLOWING TANK NUMBER AND PHASE.

TANK NO.	MANIFEST NUMBER AND DISPOSAL FACILITY	WASTE CODES FOR MATERIAL*
137-2	91165 (GSX), 91170 (GSX), 91171 (GSX), 91172 (GSX), 91174 (GSX), 91179 (GSX), 91180 (GSX), 91182 (GSX), 91183 (GSX), 91184 (GSX), 91185 (GSX), 91188 (GSX), 91201 (GSX), 91202 (GSX)	D022, D039
138- 1	91026 (DuPont)**, 91027 (DuPont)**	X722, D00S
139- 1	90022 (DuPont)	X722, Non-Hazardous
2	91052 (Giant)	X722, Non-Hazardous
140- 1	91025 (Giant), 91028 (Giant)**, 91051 (Giant), 91052 (Giant)	X722, Non-Hazardous
141- 1	90022 (DuPont), 91024 (DuPont)	X722, Non-Hazardous
142- 1	EMPTY	X722, D018, D040
143- 1	91024 (DuPont), 91032 (DuPont)	X722, Non-Hazardous
144- 1	EMPTY	X722, Non-Hazardous
145- 1	91026 (DuPont)**	X722, D00S,
2	91150 (GSX), 91151 (GSX), 91160 (GSX), 91161 (GSX), 91166 (GSX), 91167 (GSX), 91173 (GSX), 91175 (GSX), 91176 (GSX), 91177 (GSX), 91188 (GSX), 91201 (GSX), 91202 (GSX)	X725, D00S, D018, D019, D022, D039
127 Spill Cleanup	91320 (GSX), 91321 (GSX), 91322 (GSX), 91323 (GSX), 91326 (GSX), 91327 (GSX), 91328 (GSX), 91329 (GSX), 91331 (GSX), 91334 (GSX)	D00S, D040

* Denotes waste codes for identified tank material. Other material from site may have been included with each respective load thus changing the waste code(s) for any specific manifest. See specific manifest for exact waste codes.

** Notations not written on manifest. The manifest document number assigned to the tank phase is the most probable manifest the material was transported under.

sb:MC\data\11-12-2.doc

By early Marei 1991, the non-aqueous phase of Tank 128 and a small portion of the aqueous phase was transported to the Group's planned secondary disposal facility, the ENSCO incinerator in El Dorado, AR, for disposal. However, ENSCO stopped accepting new PCB contaminated waste materials in late March, 1991. The Group directed Stout to negotiate new disposal capaeity for the remaining material with the Roilins incinerator in Texas. Waste stream approvals and firm disposal schedulles were not received from Rollins untll early June, 1991. To facilltate other Tank Farm work, the contents of Tank 128 were transferred to three, 20,000 gallon Baker tanks to temporarily store the material whlle disposal approvals were received from Rollins, TX. The tiuree Baker tanks (EG1230, EG137 and EG1050) were positioned just south of the eievated railroad on the east end of the Site (see Figure 7). A 4-foot QP berm was constmrted around tiie tanks to contain any leaks or spills.

Tank analytrcal data was delayed approximateiy 2-1/2 months due to the increased number of samples taken from the tank farm tanks. The original sampling approach was to take one composite sample from each tank; however, the NJDEPE required that one sample be taken from each phase within a tank. This increase in samples caused a backlog of testing at the lab. Tank material disposal processing could not begin until the analytrcal was received and a determination made as to which disposal facillty would be used.

Initial facllity disposal approval was a four to six week process. Waste characterizations and profiles were submitted to each disposal facility for review who in tum had to have the profile approved by their respective state agency. Changing tank conditions due to weather (temperature) and the inabillty to visually inspert tank contents in bulk to verify produrt state and volume imtll actual encounter of the material during removal, extended the approval process. Some tank contents termed pumpable via sample representation were actually non-pumpable upon actual handling necessitating changes to waste profiles for a disposal facillty in order for that facility to accept the material.

Tank material from 6 tanks went tiurough a stabllization process in order to dispose of the material in a secure landfill (RCRA Part B permitted hazardous waste landfill). These tanks are 127, 131, 132, 134, 135 and 145. The material contained in these tanks was a semi-solld veith some free llquids which could not be transported untll the free llquids had been stabllized. It was deeided to stabilize this material with kiln dust or sawdust to adsorb the ilquid contained within the material. Table 2-11 shows the stabilized material transported from each tank.

TABLE 2-11

TANK FARM STABILIZED MATERIAL

BORNE CHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

TANK NUMBER	FENAL WEIGHT, LBS	ESTIMATED BEGENNING WEIGHT, LBS	ESTIMATED SAWDUST ADDED, LBS	ESTIMATED KE.N DUST ADDED, LBS
127	738,836	377,629	361,207	–
131	650,620	226,645	423,975	–
132	157,640	47,589	110,051	–
134	364,190	160,402	63,943	139,845
137	411,070	118,250	152,976	139,844
145	476,940	129,052	68,198	279,690
	2,799,296	1,059,567	1,180,350*	559,379**

* Approximately 1% of sawdust deilvered to site was lost while loading into tanks.

** Kiln Dust was added directly to tanks from transport truck.

Cleaning of the tanks encompassed a combination of scraping, shoveling, water blasting and the use of a steam jenny to remove visual accumulations from the tank walls and bottoms. Each tank required approximately 30 man-hours to elean. Table 2-12 lists by tank number the dates each tank was accepted by the NJDEPE and DUNN as elean for scrapping and the date the tank was scrapped.

Water contained within the Tank Farm berm was removed from this area on May 29 and 30, 1991 after completion of the initial phase of the Tank 127 spill elean-up (see Section 2.6.2 for spill details). The work plan required a one-time removal of Tank Farm water at the completion of tank contents removal activities. Approximately 42,281 gallons of non-hazardous water were transported to Du Pont for disposal.

2.6.1 Tank Farm Piping Removal

Piping from within the Tank Farm berm was traced and removed once tanks were emptied. Much of the pipe removed from the Tank Farm was above-ground. Below-ground tank bottom sections were excavated prior to tank removal for inspection of any below-ground pipe connections. Existing below-ground pipe connections from tanks were traced. The vast majority of pipe removed from the Tank Farm was open-ended. Some pipe had been cut on both connection ends. Very small quantities of product were removed from the below-gromd pipe by draining product into drums during the pipe removal operation.

Approximately 4,500-feet of pipe was removed from the Tank Farm. Tank Farm pipe was staged along the north-central berm of the Tank Farm. Visible accumulations from pipes were removed using a steam jenny. Piping was inspected by the NJDEPE and DUNN. All Tank Farm pipe was scrapped by P. Feldman.

2.6.2 Tank 127 Spill

At approximately 2:45 p.m. on Friday, May 17, 1991 a continuous leak of material was discovered from a hole approximately 2" in diameter in the side of Tank 127 within the Tank Farm area. Immediate action was taken to stop the leak and the NJDEPE Hotline was notified of the ineldent. The spill involved an estimated 13,000 gallons of an unknown waste product and contaminated water. During the initial sampling phase of the program, this material had been analyzed for RCRA and TCLP waste characteristics, and was elassified as a characteristic hazardous waste for high Barium (D005) and high Trichloroethene (D040) concentrations.

TABLE 2-12
TANK FARM TANK CLEANING AND REMOVAL
BORNE CHEMICAL COMPANY SITE
ELIZABETH, NEW JERSEY

Tank #	Inspected by NJDEPE	Inspected by DUNN	Date of Acceptance	Date Scrapped
123	X		7/3/91	7/18/91
124	X		4/11/91	7/2/91
125	X		7/3/91	7/18/91
126		X	10/14/91	10/14/91
127		X	7/12/91	7/17/91
128		X	8/29/91	8/29/91*
129	X		7/3/91	7/17/91
130		X	8/29/91	8/29/91
131	X		6/19/91	7/1/91
132	X		6/6/91	7/18/91
133	X		5/29/91	7/22/91
134		X	5/21/91	5/21/91
135	X		6/19/91	7/3/91
136		X	8/29/91	8/29/91
137		X	5/24/91	5/24/91
138	X		6/6/91	7/11/91
139	X		4/2/91	7/2/91
140	X		4/11/91	7/9/91
141	X		4/11/91	7/9/91
142	X		1/10/91	7/10/91
143	X		4/11/91	7/10/91
144	X		4/11/91	7/10/91
145		X	5/21/91	5/22/91

* Tank 128 contained TSCA regulated material (PCB>50ppm). The tank was cleaned but not triple rinsed. Instead, it was cut up and shipped to the CWM landfill in Emelle, AL under Manifest Document Number 91354A, State Manifest Number CWMA 414542, dated 10/11/91.

The initial notification of the produrt spill was reported to the New Jersey Department of Environmental Protection (NJDEPE) Spill Hotline (609-292-5560) pursuant to the New Jersey Administrative Code (N.J.A.C.) Subchapter 2, Section 7:2E-2.1, Notification of Discharges, and was recorded as Case Number 91 517152700. At tie time of the spill, remediation activities were being undertaken, ineluding the removal and disposal of materials from the tanks, followed by tank eleaning and the scrapping of some tanks. The Tank Farm also contained approximately 40,000 gallons of accumulated rain water having an average depth of approximately 1 to 2-feet.

Written notification of this spill was made to the City of Elizabeth, Department of Health, Welfare and Housing, and to the NJDEPE, Division of Environmental Quallty, Bureau of Communications and Support Services, CN-411, Trenton, NJ 08625 in accordance with the requirements of Subchapter 5, Section 7:1E-5.5. The results of this cleanup action and recommendations for further investigation and remediation were reported to the NJDEPE on July 16, 1991 (within 60 days of the spill) pursuant to Subchapter 2, Section 7:1E-2.2, Confirmation of Notification; Report.

The spill was completely contained within the earthen berm surrounding the Tank Farm area. Cleanup of the spill began at approximatcly 8:30 p.m., Friday, May 17, 1991 at the direction of the NJDEPE. The surface spill cleanup was completed on Friday, May 24, 1991 resulting in the collection of approximately 8,000 gallons of spilled produrt which was shipped to the Giant Cement Company in Harleyville, SC as a hazardous waste for disposal in their klln. The remaining spill material adhered to soll, stone, tank and pipe surfaces within the Tank Farm, or collerted at the bottom of the Tank Farm in the vicinity of the spill area.

A black ring of spilled Tank 127 material was visible along the entire shoreline of the Tank Farm, dispersed on accumulated rain water before it was vacuumed up by the emergency response crew. Later, the rain water was removed from the Tank Farm for off-Site disposal as part of planned removal and disposal work, and the black staining extended some distance down the earthen berm slope towards the Tank Farm bottom. Investigation of this stained area showed that it was a fraction of an inch thick, and it could be removed by llght scraping and raking of the stained soll.

A crew of three field technicians used shovels, rakes and scrapers to remove the black stained soll from around the shoreline. The collected solls were staged on-Site on a 10-mll polyethylene plastic sheet pending recclpt of the laboratory data. The staged soll was covered with a 10-mll polyethylene plastic sheet to protert it from action by wind and rain. A

composite sample of the collected soll (estimated volume is 60 cubic yards) was collected on July 23, 1991 and sent to a New Jersey Certified laboratory for full RCRA and TCLP analysis to determine the proper waste cıaracterization of this material. Upon recclpt and verification of tiıe laboratory data, a waste manifest was prepared for the soll and approximatcly 433,340 pounds of spill material was disposed of at the GSX Landfill using an existing waste stream approval for the Site.

The planned removal and disposal work resulted in the dismantling and scrapping of 11 of the 23 tanks in tiıe Tanks Farm (Tanks 124, 125, 126, 127, 128, 131, 132, 134, 137, and 145) during the sludge stabilization and removal process. The remaining 12 tanks (Tanks 123, 129, 130, 133, 135, 136, 138, 140, 141, 142, 143, and 144) were to be cleaned and left in the Tank Farm area. However, the Tank 127 spill resulted in the contanıination of the bottom exterior sıufaces of these tanks, the connecting pipe and valves, and the crushed stone placed between and around many of these tanks for access. The labor expense and time required to clean these exterior tank and pipe surfaces, and to remove the crushed stone from between the tanks would have been prohibitrve. Therefore, the remaining 12 tanks were cleaned to the extent required for recycling and were cut in place using a track excavator mounted with a pafr of hydraullc shears and removed from the Site as scrap stecl. Therefore, all tanks from the Tank Farm have been dismantied and scrapped.

2.7 Non-Specific Outdoor Areas

There were 12 above-ground storage tanks (excluding Tank Farm tanks) located throughout the outdoor areas of the site and adjacent to stmctures (see Figure 1). These tanks varied in volume from less than 500 gallons to more than 5,000 gallons. Some tanks had material in them, others did not. Material was removed from tanks using a vacuum tmck and an afr pump in the case of non-aqueous layers. After material was removed, each tank was cleaned using a steam jenny with the cleaning rinseate collected for disposal as wastewater. The cleaned tanks were inspected by the NJDEPE and then cut up for stecl recycling. Table 2-13 provides a breakdown, by tank number, of the material contained within the tanks and the disposal facillty used to dispose of the material.

Site debris was staged in the northeastem area of the site on a layer of polyethylene plastic sheeting. Debris from bulldings and various outdoor site areas was transpocted to the debris staging area with the use of backhoes, bobcats, a forklift, track loader and a front-end loader. Debris material was later loaded into dump trallers for off-site disposal at GSX using a front-end loader, backhoes and a track loader.

TABLE 2-13
OUTDOOR TANK CONTENTS SUMMARY
BORNE CHEMICAL COMPANY SITE
ELIZABETH, NEW JERSEY

Tank #	Contents (gailons)	Disposal Facility	Date Tank Scrapped
116	EMPTY	–	7/16/91
117	960, Fuel Oil	GIANT	7/16/91
118	EMPTY	–	7/16/91
119-1 119-2	250, Aqueous 3, Sludge	DUPONT GSX	6/27/91
120	1150, Fuel Oil	GIANT	7/11/91
121	65, Oil	GIANT	7/1/91
122	EMPTY	–	NOT SCRAPPED
146	EMPTY	–	S/10/91
147-1 147-2	18, Aqueous 5, Sludge	DUPONT GSX	5/14/91
148	EMPTY	–	7/23/91
149	EMPTY	–	5/13/91
Un-numbered (South of office Building)	EMPTY	–	6/27/91
2 Un-numbered (Southwest comer of A/B Warehouse)	EMPTY	–	5/14/91

A vehicle and equipment decontamination pad 12-feet wide by 20-feet long, was constructed approximately 30-feet north of Building F. The pad was formed on September 28, 1990 and poured on October 1, 1990 using 3,000 pound concrete. The pad was constructed with a collection sump measuring 2-feet by 2-feet by 4-feet deep located in the northwest coruer of the pad. The sides of the pad are siurounded with an 8-inch high curb. Rinsate from decon procedures was collected in the sump and pumped to a holding tank (first tank) located approximately 20-feet nortii of the decon pad. This material was then transferred to a NJDEPE ilcensed hauler for transpoct to Du Pont for disposal. Decontamination of vehicles and equipment was accomplished using a steam jenny.

During site debris collection in the southeast coruer of the property on November 8, 1990, the front-end loader used to transpoct site debris to fhe debris staging area broke through what appeared to be on old wooden pier just under the ground surface. The loader's right front tire broke through old beams to expose an under-ground timber structure. Stone fill and steel plates were used to cover the hole which measured approximately 2-feet by 5-feet (See Figure 7 for location).

An abandoned automobile was found on the east side of the laboratory building. According to the former plant manager, Ed Cincotta, the car was ovrued by Borue but never registered, and it was only used for on-site transportation. The automobile was stripped of many pacts and was not in operating condition. On November 28, 1990, the automobile was towed by Jim L. Towing to Riverside Auto Parts located in Rahway, NJ. A recelpt for the car is found in Appendix A.

Erosion control material consisting of hay bales and silt fencing was erected in accordance with Stout's technical work plan along the east property line on November 9, 1990 to minimize erosion along the banks of the Arthur Kill.

2.8 Clean Fill and Other Delivered Materials

Dming the coarse of the project, Stout and G.L. Neville Construction (Soil Cap Work) reqmired the use of additional materials to complete the work. Materials brought on-Site ineluded sand, for the A/B staging area, sand-bag berms and soil cap area S-1; quarry process stone (QP), for the access roads throughout the tank farm area, the Baker tank berm, the access road to the truck decontamination pad and soil cap areas S-2, S-3, S-4, S-6, S-7, S-8, S-9 and S-10; soil fill, for low spots on-Site resulting from the under-ground pipe excavations; concrete, used for capping area S-1, wall patching and caps in Buildings A, B and C; sawdust and kiln dust, for the

stabilization of tank farm material; and asphalt for the capping of areas S-2, S-3 and S-4. Table 2-14 shows the quantity of material brought on-Site.

2.9 Perimeter Air Monitoring

The perimeter air monitoring repoct and daily afr monitoring data summary logs are attaelred as Appendix F to this repoct. The report documents 20 days during the project work period where VOC levels within the Site boundary exceeded the 5 ppm above baelcground response level. Only two of these events where dfrectly related to hazardous waste handling operations at the Site, and corrective actions taken in both cases eliminated or reduced fhe measured VOC concentrations to within acceptable limits.

2.10 Site Security and Access Control

Site security fencing improvement and installation was completed prior to the clean-up operation. A 6-foot high chain link fence topped with 3-strand barbed wire eneloses the entire site. Building secuity, window guards and access doors into buildings, were inspected by the NJDEPE belore and after clean-up operations. Ail security problems resulting from the cleanup work were corrected by Stout and accepted by the NJDEPE on June 19, 1991. One set of pad locks used at the Site for Gate #3 and Gate #5 (see Figure 1) is operated by Master Lock key number A310. Most other pad locks used on the Site are operated by one of two common Master Lock key numbers 433 or 478.

Access to the Site was available through two gates, Gate #2 located between the Office Building and the Laboratory Building, and Gate #3 located just north of the elevated railroad trestie. Stout personnel and equipment used Gate #3. Gate #1, located in the southwest comer of the Site was used for two days to remove debris from Buildings C and M. Gate #4, located on the bulkhead fence line was not used.

A 24-hour security guard from Pinkerton Security and Investigation Services was on-Site during the entire elean-up program. The guard was stationed in DUNN's site trailer located at Gate #2. Ail visitors were requfred to enter the Site through Gate #2 and sign the registratron book. A monthly meeting between representatives of DUNN and Pinkerton was held to review guard performance, general problems and Site security tour procedures. There were no significant instances of Site intrusion during the Site work.

TABLE 2-14

CLEAN FILL AND OTHER MATERIAL BROUGHT ON-SITE

BORNE CHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

Material		Quantity	Contractor	Source
Concrete:	3000 psi	24 C.Y.	Stout	Loizeaux
	3000 psi	44 C.Y.	Neville	Weldon Concrete
Kilndust:		559,379 lbs.	Stout	Keystone Cement Co.
QP:		509.77 tons	Stout	Millington Quarry
		228.63 tons	Neville	Millington Quarry
		328.42 tons	Neville	Fanwood Crushed Stone
Sand:		44 tons	Stout	Millington Quarry
		47.05 tons	Neville	Dallenbach Sand Co.
Sawdust:		1,192,276 lbs.	Stout	Keystone Cement Co.
Stone:	2.5"	860.30 tons	Stout	Millington Quarry
	1.5"	119.74 tons	Stout	Millington Quarry
	0.75"	19.37 tons	Neville	Fanwood Crushed Stone
Asphalt:		75.0 C.Y.	Neville	Brian Hearth Paving

Certifications for applicable materials is found in Appendix A.

3.0 TRANSPORTATION AND DISPOSAL/RECYCLING

3.1 General Requirements

Each load of material sent from the Site, was tracked by a New Jersey Uniform Hazardous Waste Manifest document. New Jersey hazardous waste X-codes, in addition to RCRA disposal codes, were inciuded on each manifest as an additional fracking number. The manifests were prepared by Stout and reviewed by DUNN. Each shipment manifest was signed by DUNN on behalf of the Bome Chemical Company Site Participating Group, as the generator of the waste.

3.2 Disposal Facilities

The disposal of material from the site requfred the use of cight RCRA Part B permitted disposal facilities. These facilities are identified in Table 3-1.

These facilities were chosen by a sciection process which involved the Group, Stout and DUNN to assign a primary and secondary disposal facility to each waste stream. The facility choices were made on the basis of price, Group experience with a particular facility, facility acceptance scheduling capacity and audits of the facilities when no prior Group experience was documented. Table 3-2 identifies the original matrix of disposal facilities chosen. In the table, the foliowing definitions apply:

"Landfili"-	refers to a RCRA Part B permitted hazardous waste land disposal facility
"In-Spec"-	refers to the disposal facility specific specifications for each of the waste streams profiled into that facility. Parameters such as TOC, HOC, TSS, viscosity, percent oli, percent water, percent ash and others were identified by each facility.
"PCB<50 ppm"-	identifies non TSCA regulated material.
"PCB>50<500 ppm"-	identifies TSCA regulated material not requiring special handling.
"PCB>500 ppm" -	identifies TSCA regulated material which requfres special handling.

During the course of the projert, two facilities were added to the disposal matrix after favorable audits of these facilities were obtained. The two facilities are CMI located in Port Washington, NY and OMNI located in Sumter, SC. CMI was used to dispose of F-listed aqueous material from tanks 126 and 129 whlie OMNI was used to dispose of F-listed aqueous and sludge material from tanks 123, 125, 126, 127, 129 and 136.

TABLE 3-1

DISPOSAL FACILITIES

BORNE CHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

FACILITY	DISPOSAL METHOD	EPA ID NUMBER	WASTE STREAM	VOLUME OF WASTE, LBS
GSX Landfill Pinewood, SC	Landfill	SCD070375985	Hazardous & Non-Hazardous Debris	6,516,095
Giant Cement Kiln Harleyville, SC	Fuel Blending Incineration	SCD003351699	Haz & Non-Haz High BTU Wastes	635,080
OMNI Sumter, SC	Fuel Blending	SCD036275626	Sludges from Tank Bottoms	1,859,720
ENSCO El Dorado, AR	Incineration	ARD069748192	PCB's, low BTU Wastes, Lab Packs	777,608
CMI Farmingdale, NY	Chenical Treatment	NYD000691949	Haz Aqueous Wastes	410,176
WCI Hatfield, PA	N/A	PAD085690592	Drummed Waste (6 Druns)	4,451
DuPont Deepwater, NJ	Chemical Treatment	NJD002385730	Haz & Non-Haz Aqueous Wastes from Tanks & Decons	2,171,120
Rollins, NJ Bridgeport, NJ	Incineration	NJD053288239	Drummed PCB & Mercapton Wastes	35,730
			30 Misc. Drums	9,605
Rollins, TX Deer Park, TX	Incineration	TXD055141378	Aqueous and Solld Wastes	993,960
CWM- Emelle	Landfill	ALD000622464	Tank 128 Scrap	32,513
			TSCA/RCRA Empty Drums	33,020
			Project Total	13,479,078

TABLE 3-2

ORIGINAL MATRIX OF DISPOSAL FACILITIES

BORNE CHEMICAL COMPANY SITE

ELIZABETH, NEW JERSEY

CONTRACT ITEM NO.	DESCRIPTION		PRIMARY FACILITY	SECONDARY FACILITY
C-1	Hazardous Debris	Landfill	GSX	Emelle
C-2	Gas Cylinders:	Knovm	Rollins, NJ	–
		Unknovm	Rollins, NJ	–
C-3	Pumpable Aqueous:	In-Spec	Du Pont	–
		PCB<50 ppm	Du Pont	–
		PCB>50 ppm	SCA	Rollins, TX
C-4	Pumpable Waste Olls	In-Spec	Giant	Coplay
		PCB <50 ppm	Giant	Coplay
		PCB>50 <500 ppm	SCA	Rollins, TX
		PCB>500 ppm	SCA	Rollins, TX
C-5	Pumpable Sludge:	In-Spec	Giant	Coplay
		PCB <50 ppm	Giant	Coplay
		PCB>50 <500 ppm	SCA	ENSCO
		PCB>500 ppm	SCA	ENSCO
C-5(e)	Stabllized Material		GSX	Emelle
C-6	Non-Pumpable Sludge & Sollds:			
		PCB<50 ppm	Port Arthur	Rollins, TX
		PCB>50 <500 ppm	Rollins, TX	–
		PCB>500 ppm	Rollins, Tx	–
	Debris:	Landfill	GSX	Emelle

TABLE 3-2 (Continued)
ORIGBNAL MATRIX OF DISPOSAL FACILITIES
BORNE CHEMICAL COMPANY SITE
ELIZABETH, NEW JERSEY

CONTRACT ITEM NO.	DESCRIPTION		PRIMARY FACILITY	SECONDARY FACILITY
C-7(a)	Pumpable Organic Liquid:			
	PCB >50 ppm		Rollins, NJ	SCA
	PCB >50 <500 ppm	Rollins, TX	SCA	
	PCB>500 ppm	Rollins, TX	SCA	
C-7(c)	Pumpable Organic Sludge:			
	PCB <50 ppm		Rollins, NJ	SCA
	PCB >50 <500 ppm	Rollins, TX	SCA	
	PCB>500 ppm		Rollins, TX	SCA
C-7(e)	Non-Pmnpable Sludge and Sollds:			
	PCB <50 ppm		Rollins, NJ	–
	PCB >50 <500 ppm	Rollins, TX	–	
	PCB >500 ppm	Rollins, TX	–	

FACILITY LOCATIONS:

Coplay:	Logansport, IN
Du Pont:	Deepwater, NJ
Emelle:	CWM Facillty, AL
ENSCO:	El Dorado, AR
Giant:	Harleyvllle, SC
GSX:	Pinewood, SC
Port Author:	CWM Facllity, TX
Rollins, NJ:	Bridgeport, NJ
Rollins, TX:	Deer Park, TX
SCA:	Chicago, IL

3.3 Waste Profiling Procedure

Following the identification of disposal facillties to be used, a waste profile was prepared and submitted to each facility detailing the type, chararteristics and volume of waste. A profile was completed for every potential waste stream composition in order to include all material knovm to be on-Site. The profiles were completed by Stout's Technical Representative and reviewed by DUNN to ensure each profile was properly completed. Profiles were then signed by DUNN on behalf of the Bome Chemical Company Site Particlpating Group.

Profiles were first submitted to each facility for thefr review and approval. Some facllities required samples of the materiad whlle other facilities did not. Each profile was submitted with the analytical results of that material. The profiles were then submitted to the respective disposal facility State agency for final approval. Once the State approval was obtained, each disposal facility assigned work orders for Bome material which authorized the acceptance of this material for disposal. Profile approval was a four to six week process in most cases.

During the waste removal process, sawdust was used to stabilize material which had not been included on the original waste profiles to the GSX and OMNI disposal faciilties. An amendment was made to each affected profile to include sawdust so each facillty could accept the sawdust stabilized waste. The amended profiles were accepted by GSX and OMNI. The addition of sawdust was necessary to control free llquids in the waste material for safe highway transportation. Appendix G contains copies of the waste profiles submitted to each disposal facllity.

3.4 Transportation

Transportation of material from the site was accomplished with the use of EPA and NJDEPE permitted tiansportation companies. All transportation firms were checked for proper permits prior to the removal of material for shipment. The documentation of permits for each tiansporter is included in Appendix H.

K&B Trucldng, Inc., a division of Stout Envfronmental, was the original approved transporter at the beginning of fhe project. As work progressed beyond the debris transportation phase, other waste haulers were called in to expedite the removal of aqueous and sludge material from the Site. Tank tmcks, sludge box, roll-off carriers and hazardous drum haulers were used to transport material to its respective disposal facillty. Table 3-3 identifies the transportation firms used during the cleanup and thefr respective waste(s) transported.

TABLE 3-3
WASTE TRANSPORTERS
BORNE CHEMICAL COMPANY SITE
ELIZABETH, NEW JERSEY

FIRM	EPA ID NUMBER	NJDEPE PERMIT NUMBER	WASTE
K&B Trucking (Trucks assigned to Waste Conversion, Inc.)	PAD085690592	S-06209	Debris, Aqueous Tank Farm Waste, Lab Packs
Suttles Truck Leasing Demopolls, AL	OLD09704011	S-12568	PCB Aqueous and Non-Aqueous
Matlock, Inc. Wilmington, DE	NJD070408554	S-16321	Aqueous (Tank Farm Water)
Chemical Leaman Tank Lines Exton, PA	PAD084770023	S-07388	Aqueous (Tank Farm Water)
WTI (Wills Trucking Inc.) Millburg, OH	OHD068913409	S-10330	Sludge
Cousins Waste Control Toledo, OH	OHD068081595	S-50025	Sludge
CET (Custom Environmental Transportation) Wilmington, DE	DED980918858	S-10350	Hazardous Aqueous (Rollins, TX)
S&J Transport Woodstovm, NJ	NJD071629976	S-03217	Debris and Hazardous Aqueous
VoCon Lehigh Valley, PA	PAD097155014	S-07465	Drummed Hazardous Aqueous (Rollins, TX), Tank 128 Scrap
Bryson Lexington, SC	SCS000822312	S-07861	Sludge

Tmcks having to drive through the "contaminated zone" to load material were decontaminated by steam wash on the Site decontamination pad. Wash water was collected and disposed of off-Site as contaminated wastewater. Two local public weigh stations were used to get most empty and full weight tickets for weight verification. Son Pallets, Inc., located on 248 First Street, Elizabeth and Crooda Storage, Inc., located on 534 South Front Street, Elizabeth were used for local weighing. Other weight tickets were obtained at tmckstops and disposal faeilities.

3.5 New Jersey Uniform Hazardous Waste Manifests

Manifests from New Jersey, Pennsylvania, New York, South Carolina, Arkansas and Texas were used to track the transportation of material from the Site. All manifests were given a New Jersey hazardous waste code, in addition to EPA waste codes, to trart the material through the NJDEPE manifest tracking system. Each manifest had imprinted on it a manifest number which tracked the material through the respective State agency. For projert management tracking purposes, manifests were given a sequence manifest document number whiein identified the year the material was sent and the sequential number of the particular load being transported. For example, manifest document number 90016 would identify the manifest as being transported off-site during 1990 and being the 16th manifest to leave the site. Similarly, manifest document number 91315 would identify the manifest as being transported off-site during 1991 and being the 315th manifest to leave the site. Table 3-4 provides a tabulation of manifests issued during the Site removal and disposal work.

Manifests were reviewed and authorized by DUNN personnei. Copies of each manifest were forwarded to the respective State ageneies with a copy of Mr. Richard Ricei's (the Group's Liaison Counsei) letter dated September 10, 1990 authorizing the listed DUNN personnei to sign hazardous waste manifests on behalf of the Group. A copy of this letter can be found in Appendix A. Retun manifests, with off-loaded weights, were retuned signifying that loads were disposed of at the facility stated on the manifest. The verified, off-loaded weights were the basis of payment for the particular contract item. Over 350 manifests were signed by DUNN personnei authorizing transportation of material from Bome Chemical to its respective disposal facility. A copy of each retum manifest with original signature verifying off-loading, can be found in Appendix I. Those manifests identified as hazardous material also have attached to them a copy of fhe land ban restriction notification which accompanied the manifest during fransportation to the designated disposal facliity. Manifests are separated by disposal facility and arranged in numerical manifest order within each disposal facility grouping. Appendix J contains the Certificates of Disposal from each facility used and is arranged by facility.

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
90001	BC-12-4-90	GSX
90002	BC-12-4-90	GSX
90003	BC-12-4-90	GSX
90004	BC-12-4-90	GSX
90005	BC-12-4-90	GSX
90006	BC-12-4-90	GSX
90007	BC-12-5-90	GSX
90008	BC-12-5-90	GSX
90009	BC-12-5-90	GSX
90010	BC-12-7-90	GSX
90011	BC-12-7-90	GSX
90012	BC-12-7-90	GSX
90013	BC-12-11-90	GSX
90014	BC-12-13-90	GSX
90015	BC-12-17-90	GSX
90016	BC-12-17-90	GSX
90017	NJA0782514	LOAD REJECTED BY DUPONT. SEE #90018
90018	NJA0782464	DUPONT
90019	BC-12-21-90	GSX
90020	NJA0782465	DUPONT
90021	NJA0782469	DUPONT
90022	NJA0782471	DUPONT
91023	NJA0782472	DUPONT
91024	NJA0782473	DUPONT
91025	BC-1-7-91	GIANT
91026	NJA0782474	DUPONT
91027	NJA0782475	DUPONT
91028	BC-1-8-91	GIANT
91029	NJA0782479	LOAD REJECTED BY DUPONT. SEE #91030
91030	NJA0782513	DUPONT
91031	NJA0782511	DUPONT
91032	NJA0782510	DUPONT
91033	AR494695	ENSCO
91034	AR494702	ENSCO
91035	AR494700	ENSCO
91036	NJA0782509	DUPONT
91037	BC-2-4-91	GIANT
91038	AR494703	ENSCO
91039	BC-2-8-91	GIANT
91040	AR494705	ENSCO
91041	BC-2-11-91	GIANT
91042	BC-2-12-91	GIANT
91043	BC-2-13-91	GIANT
91044	BC-2-13-91	GIANT
91045	BC-2-14-91	GIANT

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
91046	BC-2-15-91	LOAD REJECTED BY GIANT. SEE #91051
91047	BC-2-15-91	GIANT
91048	AR453721	ENSCO
91049	BC-2-19-91	GIANT
91050	AR453722	ENSCO
91051	BC-2-20-91	GIANT
91052	BC-2-21-91	GIANT
91053	NJA0782507	DUPONT
91054	AR453723	ENSCO
91055	NYB2462877	CMI
91056	NYB2462886	CMI
91057	NJA0782504	DUPONT
91058	NYB2462895	CMI
91059	AR441714	ENSCO
91060	AR407457	ENSCO
91061	NYB2024028	CMI
91062	AR501284	ENSCO
91063	NYB2462958	CMI
91064	BC-3-14-91	GIANT REJECTED 4950 GAL. SEE #91076
91065	AR501283	ENSCO
91066	NYB2024037	CMI
91067	BC-3-15-91	LOAD REJECTED BY GSX. RETURNED TO TO SITE DEBRIS PILE.
91068	BC-3-15-91	GSX
91069	BC-3-15-91	GSX
91070	BC-3-15-91	GSX
91071	BC-3-15-91	GSX
91072	NYB2024937	CMI
91073	BC-3-19-91	GIANT
91074	NJA0782505	DUPONT
91075	BC-3-19-91	GSX
91076	BC-3-19-91	GIANT REJECTED 3,700 GAL. SEE #91080
91077	BC-3-19-91	GSX
91078	BC-3-19-91	GSX
91079	BC-3-19-91	GSX
91080	BC-3-23-91	GIANT
91081	NYB2462940	CMI
91082	NJA0782503	DUPONT
91083	NYB2239308	CMI
91084	NJA0783109	DUPONT
91085	BC-3-29-91	GSX
91086	BC-3-29-91	GSX
91087	BC-3-29-91	GSX
91088	BC-3-29-91	GSX
91089	NJA0783113	DUPONT

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
91090	NJA0783112	DUPONT
91091	NJA0782604	DUPONT
91092	NJA0783095	DUPONT
91093	NJA0783094	DUPONT
91094	NYB2239272	CMI
91095	BC-4-5-91	GSX
91096	BC-4-5-91	GSX
91097	BC-4-5-91	GSX
91098	BC-4-5-91	GSX
91099	NYB2462904	CMI
91100	NJA0783098	DUPONT
91101	NYB2024046	CMI
91102	NJA0782609	DUPONT
91103	NJA0782608	DUPONT
91104	NJA0782607	DUPONT
91105	NJA0783100	DUPONT
91106	NJA0783099	DUPONT
91107	NJA0783101	DUPONT
91108	NJA0637076	DUPONT
91109	NJA0637077	DUPONT
91110	NJA0637078	DUPONT
91111	NJA0637127	DUPONT
91112	NJA0637126	DUPONT
91113	NYB2462976	REJECTED AT CMI. RETURNED TO TANK 136 AT SITE AND LATER SENT TO ENSCO.
91114	NYB2462994	REJECTED AT CMI. RETURNED TO TANK 136 AT SITE AND LATER SENT TO ENSCO.
91115	BC-4-19-91	GSX
91116	BC-4-19-91	GSX
91117	BC-4-19-91	GSX
91118	BC-4-23-91	LOAD REJECTED BY GSX. RETURNED TO DEBRIS PILE AT SITE.
91119	BC-4-23-91	LOAD REJECTED BY GSX. RETURNED TO DEBRIS PILE AT SITE.
91120	NYB2463003	REJECTED AT CML RETURNED TO TANK 136 AT SITE AND LATER SENT TO ENSCO.
91121	BC-4-19-91	GIANT
91122	BC-4-20-91	GSX
91123	BC-4-20-91	GSX
91124	BC-4-22-91	GSX
91125	BC-4-22-91	GSX
91126	BC-4-22-91	GSX
91127	BC-4-22-91	GSX
91128	BC-4-22-91	GSX
91129	BC-4-22-91	GSX

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
91130	BC-4-22-91	GSX
91131	NJA0637124	LOAD REJECTED BY DUPONT. SEE #91133
91132	BC-4-24-91	GIANT
91133	NJA0637122	DUPONT
91134	BC-4-25-91	GIANT REJECTED 2,000 GAL. SEE #91140
91135	BC-4-26-91	GSX
91136	BC-4-26-91	GSX
91137	BC-4-26-91	GSX
91138	BC-4-27-91	GSX
91139	NJA0637121	DUPONT
91140	BC-4-30-91	GIANT
91141	NJA0637081	DUPONT
91142	NJA0637083	DUPONT
91143	AR501279	ENSCO
91144	BC-5-07-91	GSX
91145	AR501280	ENSCO
91146	NJA0637082	DUPONT
91147	BC-5-7-91	GSX
91148	BC-5-7-91	GSX
91149	BC-5-7-91	GSX
91150	BC-5-7-91	GSX
91151	BC-5-7-91	GSX
91152	BC-5-8-91	GSX
91153	AR501281	ENSCO
91154	BC-5-10-91	GSX
91155	BC-5-8-91	GSX
91156	BC-5-8-91	GSX
91157	BC-5-8-91	GSX
91158	BC-5-8-91	GSX
91159	NJA0637084	DUPONT
91160	BC-5-8-91	GSX
91161	BC-5-8-91	GSX
91162	AR501282	ENSCO
91163	BC-5-9-91	GSX
91164	BC-5-9-91	GSX
91165	BC-5-9-91	GSX
91166	BC-5-9-91	GSX
91167	BC-5-9-91	GSX
91168	AR506389	ENSCO
91169	VOIDED AT SITE. NOT USED	
91170	BC-5-10-91	GSX
91171	BC-5-10-91	GSX
91172	BC-5-10-91	GSX
91173	BC-5-11-91	GSX
91174	BC-5-11-91	GSX

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
91175	BC-5-13-91	GSX
91176	BC-5-13-91	GSX
91177	BC-5-13-91	GSX
91178	AR506384	ENSCO
91179	BC-5-13-91	GSX
91180	BC-5-13-91	GSX
91181	BC-5-14-91	OMNI
91182	BC-5-14-91	GSX
91183	BC-5-14-91	GSX
91184	BC-5-14-91	GSX
91185	BC-5-14-91	GSX
91186	BC-5-14-91	GSX
91187	AR506388	ENSCO
91188	BC-5-15-91	GSX
91189	BC-5-15-91	TRANSPORT FAILURE. SEE #91191
91190	BC-5-16-91	GSX
91191	BC-5-15-91	GSX
91192	BC-5-15-91	GSX
91193	BC-5-20-91	GSX
91194	BC-5-20-91	GSX
91195	BC-5-20-91	GSX
91196	BC-5-20-91	GSX
91197	BC-5-20-91	GSX
91198	BC-5-20-91	OMNI
91199	BC-5-21-91	REJECTED BY GSX. SEE #91203
91200	BC-5-21-91	GSX
91201	BC-5-22-91	GSX
91202	BC-5-22-91	GSX
91203	BC-5-22-91	GSX
91204	BC-5-22-91	GSX
91205	BC-5-22-91	GSX
91206	BC-5-22-91	OMNI
91207	BC-5-22-91	REJECTED BY GSX. RETURNED TO SITE DEBRIS PILE.
91208	BC-5-23-91	GSX
91209	NJA0637119	DUPONT
91210	BC-5-23-91	GSX
91211	BC-5-24-91	GSX
91212	BC-5-28-91	REJECTED BY GIANT. SEE #91226.
91213	BC-5-28-91	GSX
91214	BC-5-28-91	GSX
91215	BC-5-28-91	OMNI
91216	VOIDED AT SITE. NOT USED	
91217	BC-5-28-91	GSX
91218	PAC3903233	WCI
91219	PAC3911751	WCI

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
91220	NJA0637116	DUPONT
91221	NJA0637115	DUPONT
91222	BC-5-30-91	GSX
91223	BC-5-30-91	GSX
91224	NJA0637085	DUPONT
91225	BC-5-30-91	OMNI
91226	BC-5-30-91	OMNI
91227	BC-5-30-91	GSX
91228	NJA0637114	DUPONT
91229	BC-6-3-91	GSX
91230	NJA0637118	DUPONT
91231	BC-6-3-91	GSX
91232	BC-6-3-91	GSX
91233	BC-6-4-91	GSX
91234	BC-6-4-91	OMNI
91235	BC-6-4-91	GSX
91236	NJA0637086	DUPONT
91237	NJA0637087	DUPONT
91238	BC-6-5-91	OMNI
91239	BC-6-5-91	GSX
91240	NJA0637111	DUPONT
91241	BC-6-5-91	GSX
91242	BC-6-5-91	GSX
91243	NJA0637110	DUPONT
91244	BC-6-6-91	GSX
91245	BC-6-7-91	GSX
91246	BC-6-7-91	GSX
91247	NJA0637109	REJECTED BY DUPONT. SEE #91293.
91248	BC-6-10-91	OMNI
91249	PAC1821886	WCI
91250	BC-6-11-91	OMNI
91251	BC-6-12-91	GSX
91252	BC-6-12-91	GSX
91253	BC-6-12-91	GSX
91254	BC-6-12-91	OMNI
91255	BC-6-13-91	GSX
91256	NJA0637080	RES, NJ
91257	BC-6-13-91	OMNI
91258	BC-6-13-91	GSX
91259	BC-6-14-91	GSX
91260	BC-6-14-91	GSX
91261	BC-6-14-91	GSX
91262	BC-6-14-91	OMNI
91263	BC-6-17-91	OMNI
91264	BC-6-17-91	LOAD REJECTED BY OMNI. SEE #91278

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
91265	BC-6-17-91	LOAD REJECTED BY OMNI. SEE #91279
91266	BC-6-17-91	GSX
91267	BC-6-17-91	GSX
91268	BC-6-17-91	GSX
91269	BC-6-17-91	GSX
91270	BC-6-17-91	LOAD REJECTED BY OMNI. SEE #91280
91271	BC-6-17-91	LOAD REJECTED BY OMNI. SEE #91281
91272	BC-6-18-91	GSX
91273	BC-6-18-91	GSX
91274	BC-6-18-91	GSX
91275	BC-6-19-91	GSX
91276	BC-6-19-91	GSX
91277	00524699	ROLLINS, TX
91278	BC-6-17-91	OMNI
91279	BC-6-17-91	OMNI
91280	BC-6-17-91	OMNI
91281	BC-6-17-91	OMNI
91282	00524698	ROLLINS, TX
91283	00524683	ROLLINS, TX
91284	00524697	ROLLINS, TX
91285	00524695	ROLLINS, TX
91286	00524694	ROLLINS, TX
91287	00249122	ROLLINS, TX
91288	00249119	ROLLINS, TX
91288 (DUPLICATE)	00524692	ROLLINS, TX (DUPLICATE MANIFEST DOCUMENT NUMBER WAS USED IN ERROR)
91289	00524691	ROLLINS, TX
91290	00524640	ROLLINS, TX
91291	BC-7-12-91	GSX
91292	BC-7-12-91	GSX
91293	NJA0637107	DUPONT
91294	00524690	ROLLINS, TX
91295	00524688	ROLLINS, TX
91296	00524689	ROLLINS, TX
91297	BC-7-19-91	OMNI
91298	BC-7-22-91	OMNI
91299	00524687	ROLLINS, TX
91300	BC-7-23-91	OMNI
91301	BC-7-24-91	OMNI
91302	BC-7-29-91	OMNI
91303	00524685	ROLLINS, TX
91304	BC-7-31-91	OMNI
91305	00524641	ROLLINS, TX
91306	BC-8-5-91	OMNI
91307	BC-8-5-91	OMNI

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
91308	00524639	ROLLINS, TX
91309	BC-8-7-91	OMNI
91310	BC-8-7-91	OMNI
91311	BC-8-8-91	OMNI
91312	BC-8-9-91	OMNI
91313	BC-8-12-91	OMNI
91314	BC-8-13-91	OMNI
91315	BC-8-14-91	OMNI
91316	00524642	ROLLINS, TX
91317	BC-8-14-91	OMNI
91318	BC-8-21-91	OMNI
91319	BC-8-22-91	OMNI
91320	BC-8-23-91	GSX (TANK 127 SPILL CLEANUP)
91321	BC-8-23-91	GSX (TANK 127 SPILL CLEANUP)
91322	BC-8-23-91	GSX (TANK 127 SPILL CLEANUP)
91323	BC-8-23-91	GSX (TANK 127 SPILL CLEANUP)
91324	BC-8-23-91	GSX
91325	BC-8-21-91	OMNI
91326	BC-8-26-91	GSX (TANK 127 SPILL CLEANUP)
91327	BC-8-26-91	GSX (TANK 127 SPILL CLEANUP)
91328	BC-8-26-91	GSX (TANK 127 SPILL CLEANUP)
91329	BC-8-26-91	GSX (TANK 127 SPILL CLEANUP)
91330	BC-8-26-91	OMNI
91331	BC-8-26-91	GSX (TANK 127 SPILL CLEANUP)
91332	BC-8-26-91	OMNI
91333	BC-8-27-91	OMNI
91334	BC-8-28-91	GSX (TANK 127 SPILL CLEANUP)
91335	BC-8-28-91	GSX
91336	BC-8-29-91	OMNI
91337	BC-9-4-91	OMNI
91338	BC-9-5-91	OMNI
91339	BC-9-6-91	OMNI
91340	BC-9-9-91	OMNI
91341	BC-9-10-91	OMNI
91342	BC-9-11-91	OMNI
91343	BC-9-12-91	OMNI
91344	BC-9-13-91	OMNI
91345	BC-9-18-91	OMNI
91346	BC-9-20-91	OMNI
91347	BC-9-24-91	OMNI
91348	BC-9-26-91	OMNI
91349	BC-8-27-91	OMNI
91350	00534624	ROLLINS, TX
91351	BC-10-1-91	OMNI
91352	BC-10-8-91	OMNI

TABLE 3-4
MANIFEST TABULATION

MANIFEST NO.	STATE MANIFEST NO.	DISPOSAL FACILITY AND COMMENTS
91353	BC-10-8-91	OMNI
91354	BC-10-10-91	OMNI
91354A	CWMA414542	CWM, AL
91355	AR521786	ENSCO
91356	NJA0637189	DUPONT
91357 (1/3/92)	0037337	ROLLINS, TX
24641 (3/25/92)	00524647	ROLLINS, TX
24638 (3/07/92)	00524638	ROLLINS, TX
24639 (3/11/92)	00524649	ROLLINS, TX
24640 (3/18/92)	00524648	ROLLINS, TX
00001 (4/9/92)	NJA 0637334	RES, NJ
00002 (4/9/92)	NJA 0637336	RES, NJ
00100 (4/20/92)	PAC2229286	WCI
81101 (6/9/92)	CWMA 477487	CWM, AL
29382 (6/10/92)	PAC 2229382	WCI
29522 (6/11/92)	PAC 2229522	WCI

3.6 Scrap Steel Recycling

Scrapping of the tank farm tanks and steel within bulldings was first proposed to the NJDEPE in January, 1991. The NJDEPE approved scrapping in February, 1991. It was agreed that money obtained from scrapping would be put into the trust account to aid in the funding of the Site remediation work.

All piping removed from tiie site ineluding indoor, outdoor and below grade piping, and steel removed from the bulldings and outdoor tanks were eleaned by Stout prior to scrapping by P. Feldman and Sons. Red Bank Recycling was subcontracted by Stout to perform the tank and pipe cutting and loading for off-site recycling. Red Bank used a Kamatsu PC 220 track excavator with a cutting attachment (grappler) to cut and load the scrap steel into Feldman's roll-offs. All scrap steel was eleaned by Stout and inspected by DUNN prior to off-site transportation to ensure that the steel was free of product contamination as mandated by the NJDEPE. The steel scrap was also inspected by Feldman prior to thefr acceptance of each load. Appendix K contains weight tickets for all scrap taken off-site.

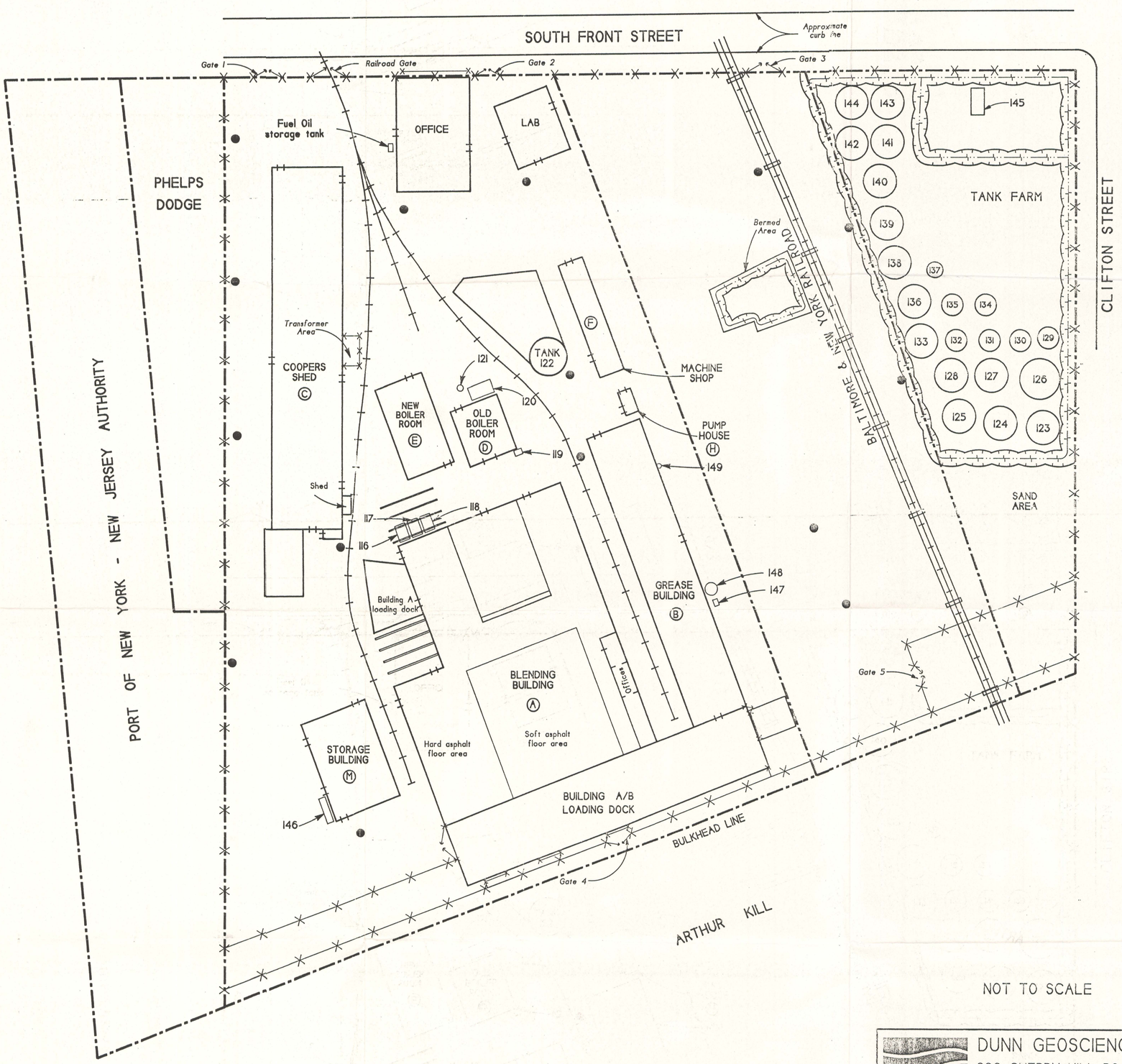
Approximately 742,120 pounds of scrap steel was recyeled for a retum value of $13,252.14. P. Feldman issued a check in this amount made payable to the Bome Chemical Corp. Site Partielpating Group. The check was submitted to Mr. Richard F. Ricel, counsel for the Group, on September 5, 1991 for deposit to the Group's Trust Fund account.

3.7 Annual Hazardous Waste Generators Report

As mandated in New Jersey Administrative Code 7:26-7.4(g)1, an annual generators report was filed with the NJDEPE for hazardous waste removal from the Site during 1990 and 1991. Since work at the Site did not commence until September, 1990, a small amount of material, in terms of total material removed from the Site during the elean-up, was reported. During the 3 months of Site activity in 1990, debris totaling 731,420 pounds or 365.71 tons, was transported to GSX for disposal. The 1990 report was submitted to the NJDEPE on June 19, 1991, and the 1991 repoct was submitted on February 29, 1992. Appendix L contains the 1990 and 1991 generators reports. An annual report for calendar year 1992 will be completed for submission to the NJDEPE by March, 1993.

PN\sb
c\data\pn\BORNEFIN.doc

FIGURES



LEGEND

- Property line
- Fence line
- Berm
- Building access
- Utility lighting pole

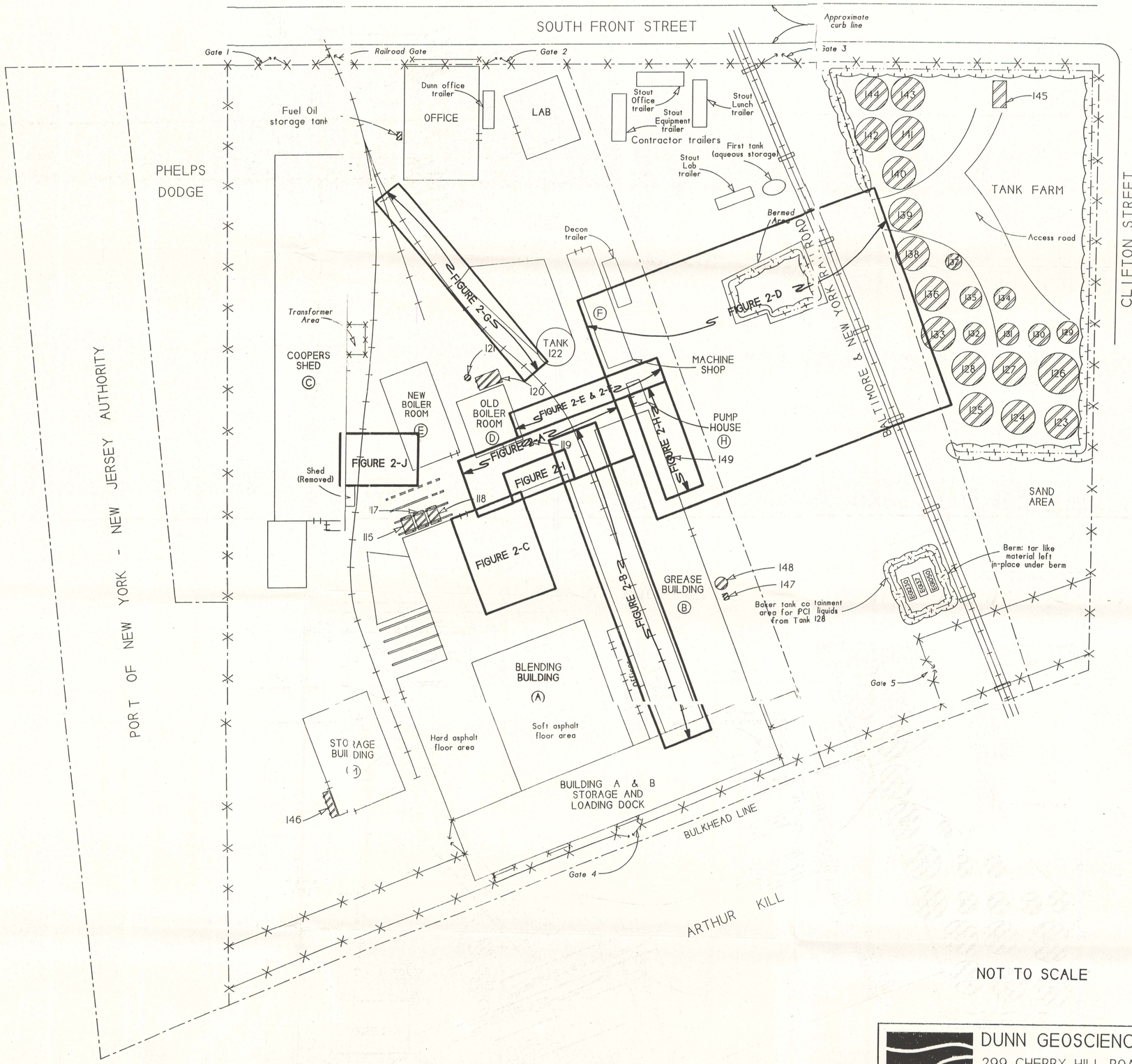
NOT TO SCALE

DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL (201)-299-9001
FAX (201)-299-0021

GENERAL SITE PLAN

BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

PROJECT MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-00495
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 1	DATE: 7/29/91



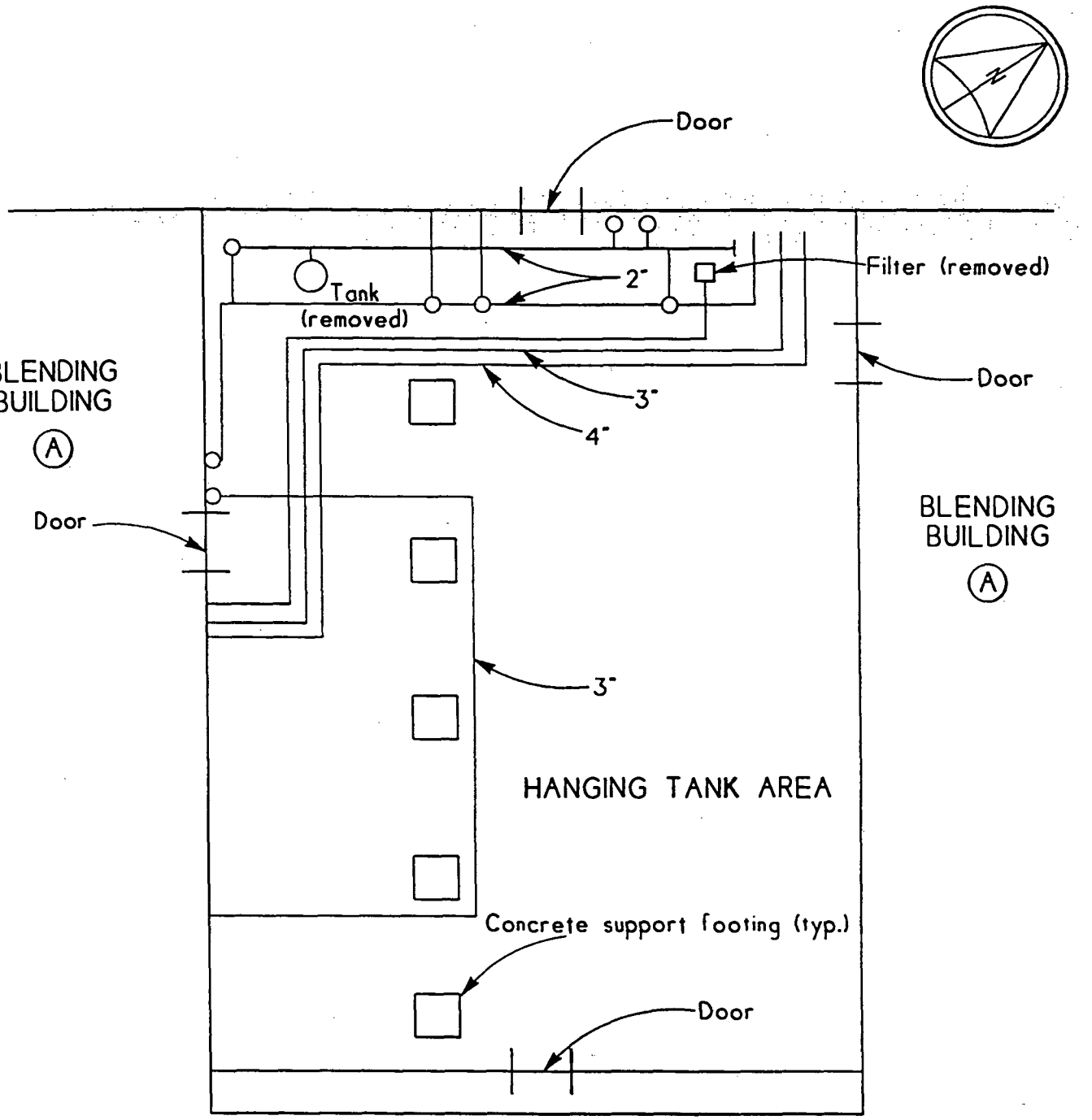
NOT TO SCALE

DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL (201)-299-9001
FAX (201)-299-0021

UNDERGROUND TRANSFER PIPING OVERVIEW

BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

PROJECT MANAGER: . NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWIN 9-00
PREPARED BY: 1. CAINE	CHECKED BY:	FIGURE 2	DATE: 7/29



LEGEND

Termination point

90° fitting

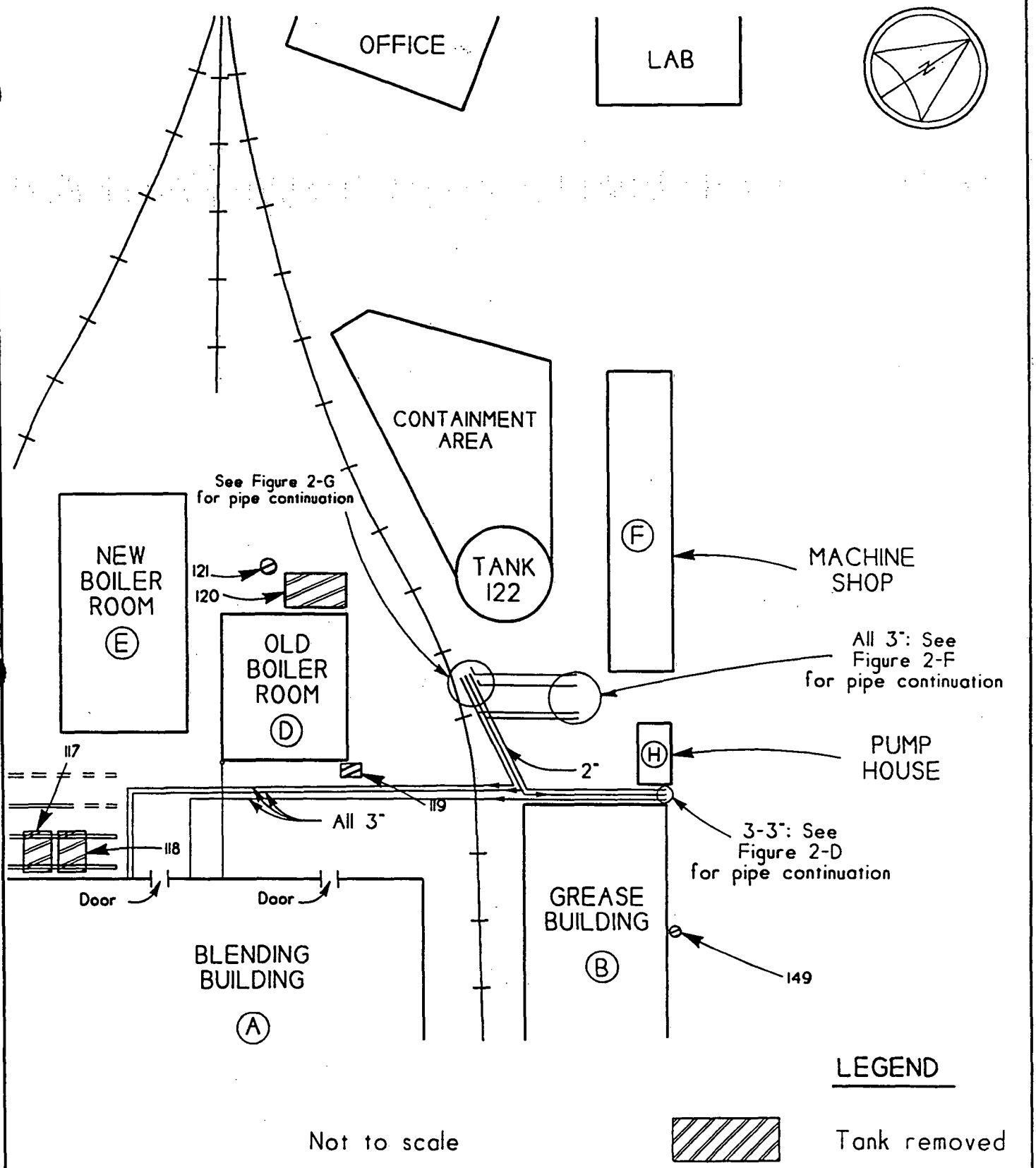
T-fitting

Not to scale

DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

PIPING BELOW HANGING TANKS
BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

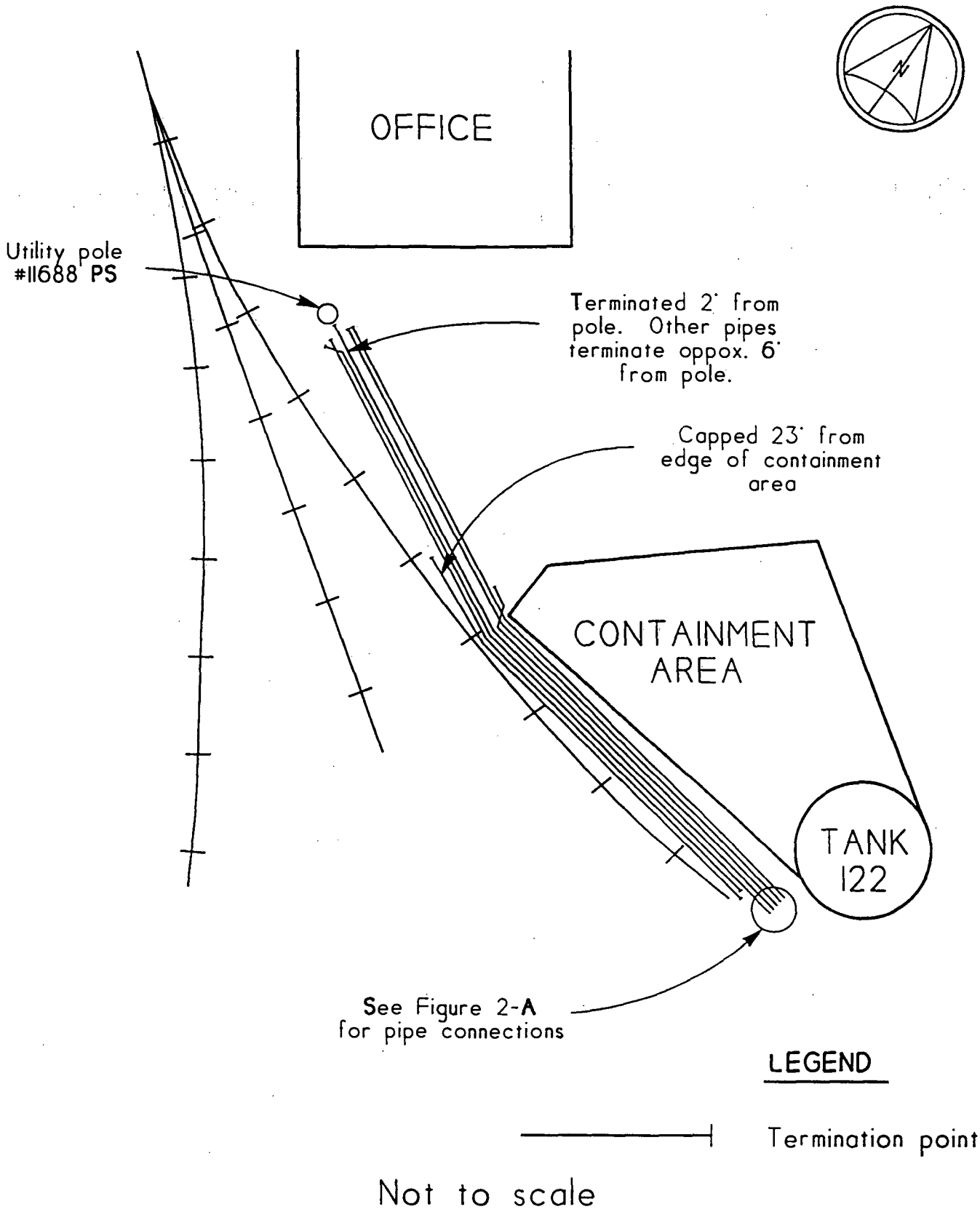
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-0031IA
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-C	DATE: 1/21/91



DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

PIPING BETWEEN BUILDINGS A, B, D & F
BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

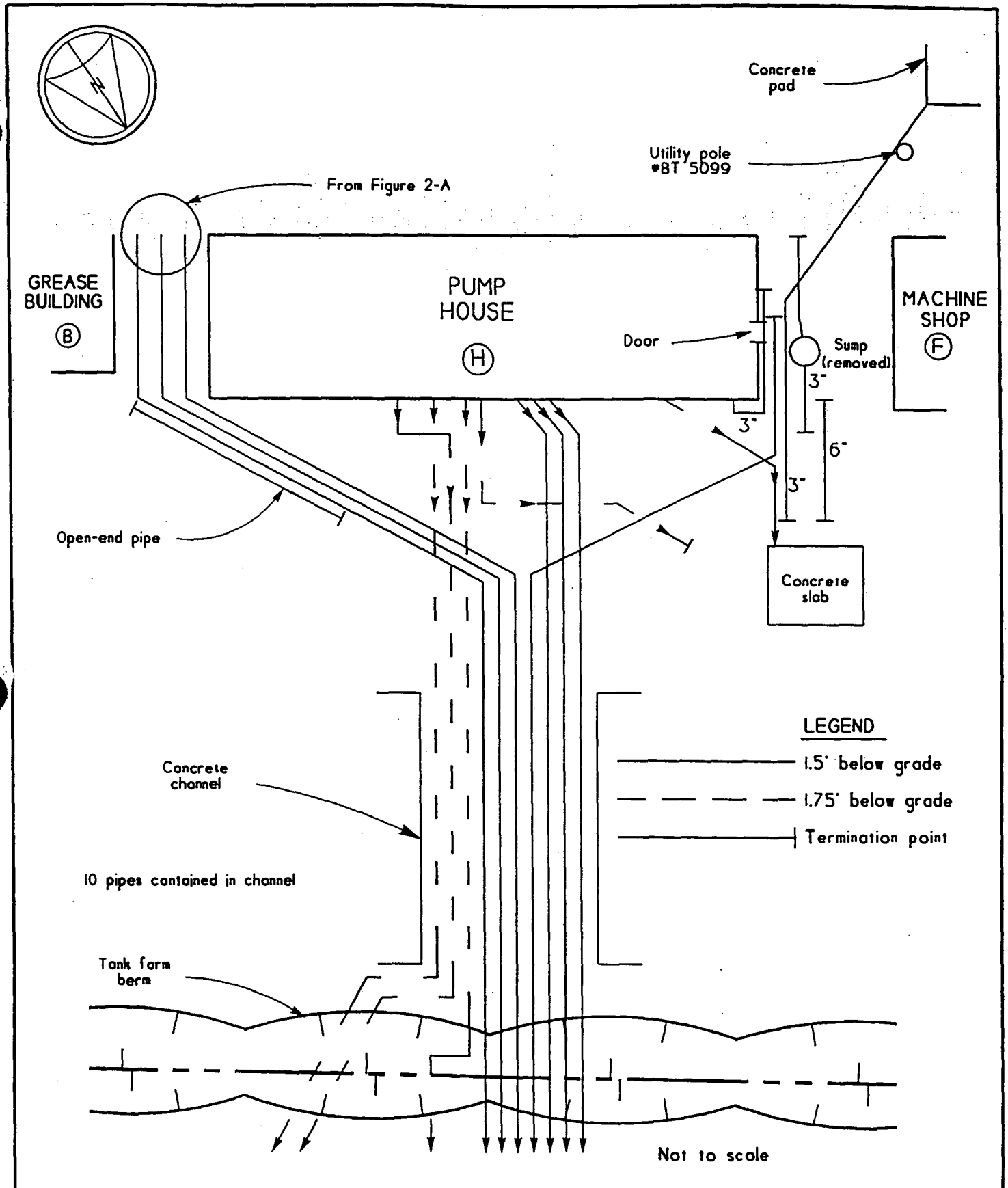
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-0031B
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-A	DATE: 1/21/91



DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

PIPE LOCATIONS ALONG NORTH RAILROAD TRACKS
BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

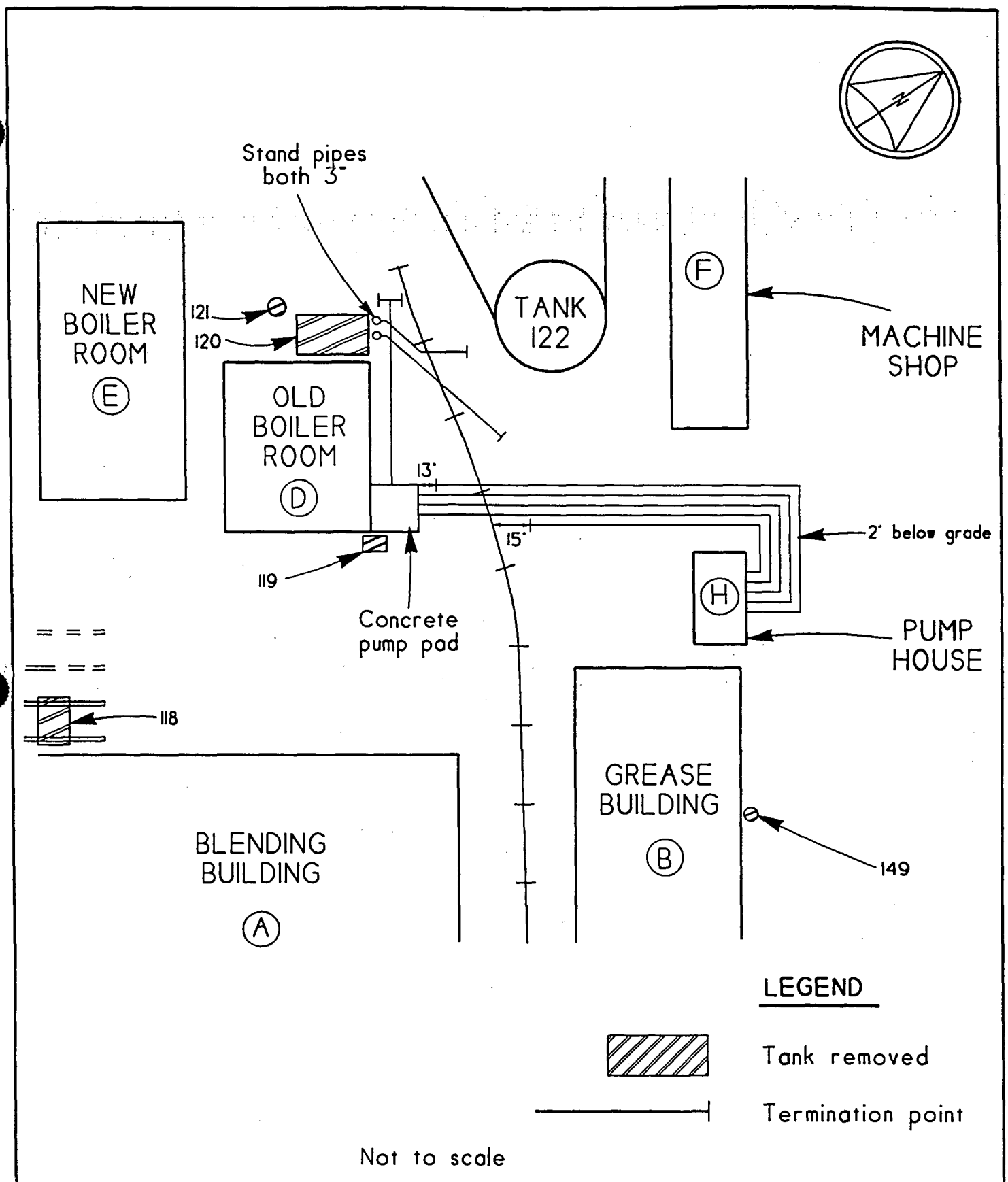
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-0031IC
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-G	DATE: 1/22/91



DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

PIPING FROM BUILDING H TO TANK FARM
BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

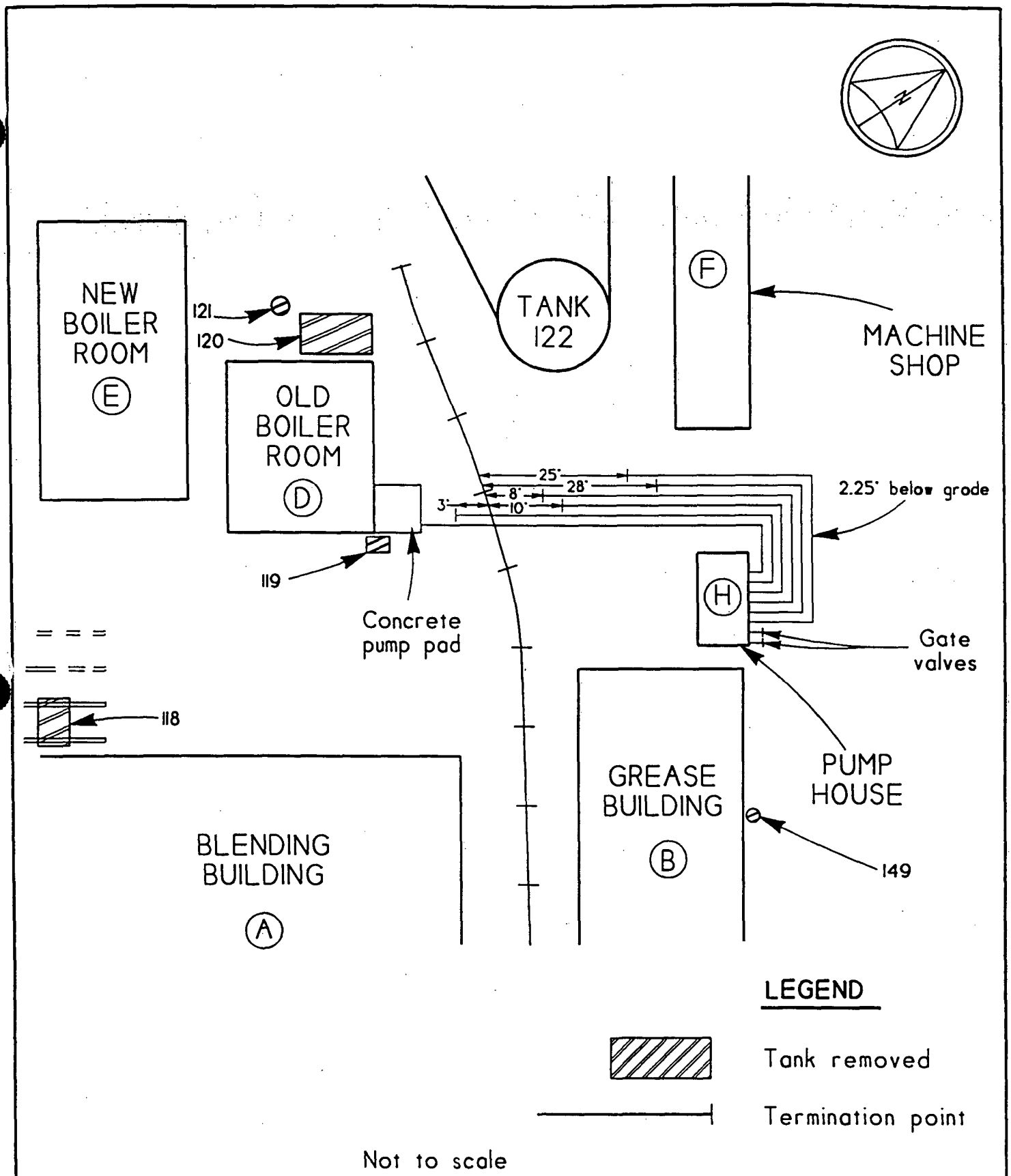
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-0031ID
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-0	DATE: 1/23/91



DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

2" PIPING FROM BUILDING H TO BUILDING D
BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-0031IE
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-E	DATE: 1/25/91

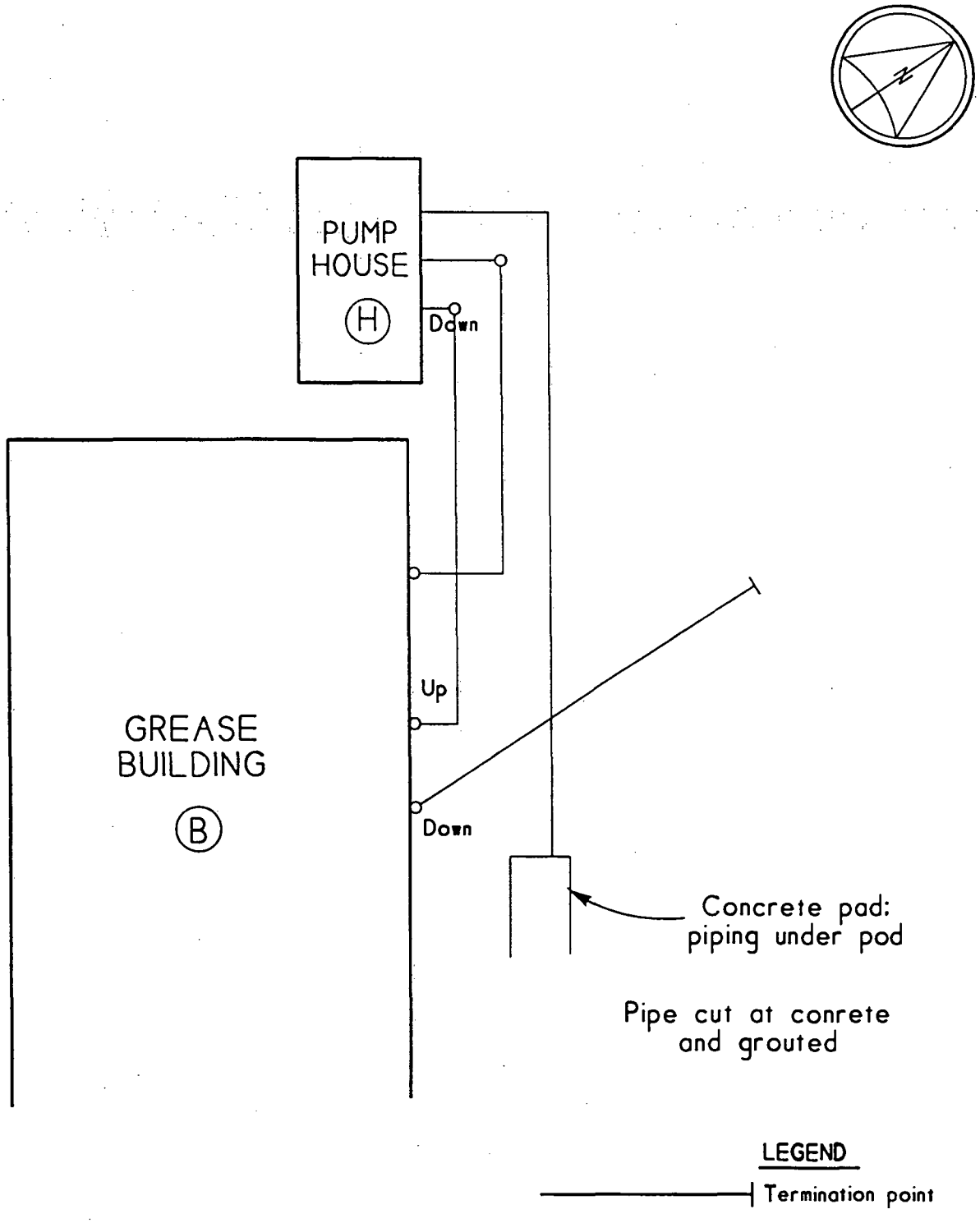


DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

3"-PIPING FROM BUILDING H TO BUILDING D

BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

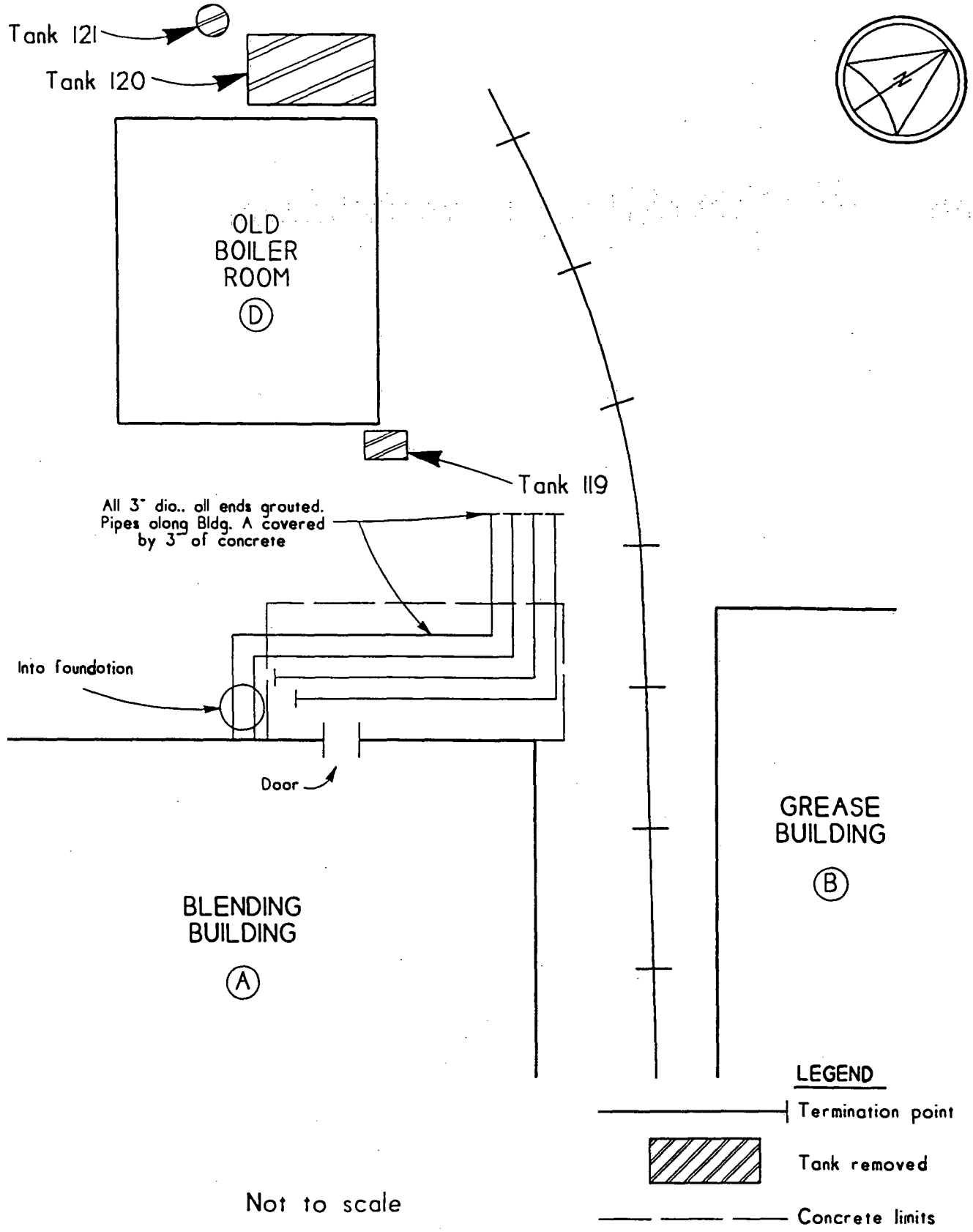
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-003IIF
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-F	DATE: 1/25/91



Not to scale

DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

PIPING FROM BUILDING H ALONG BUILDING B BORNE CHEMICAL COMPANY ELIZABETH, NEW JERSEY			
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-0031IG
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-H	DATE: 1/25/91

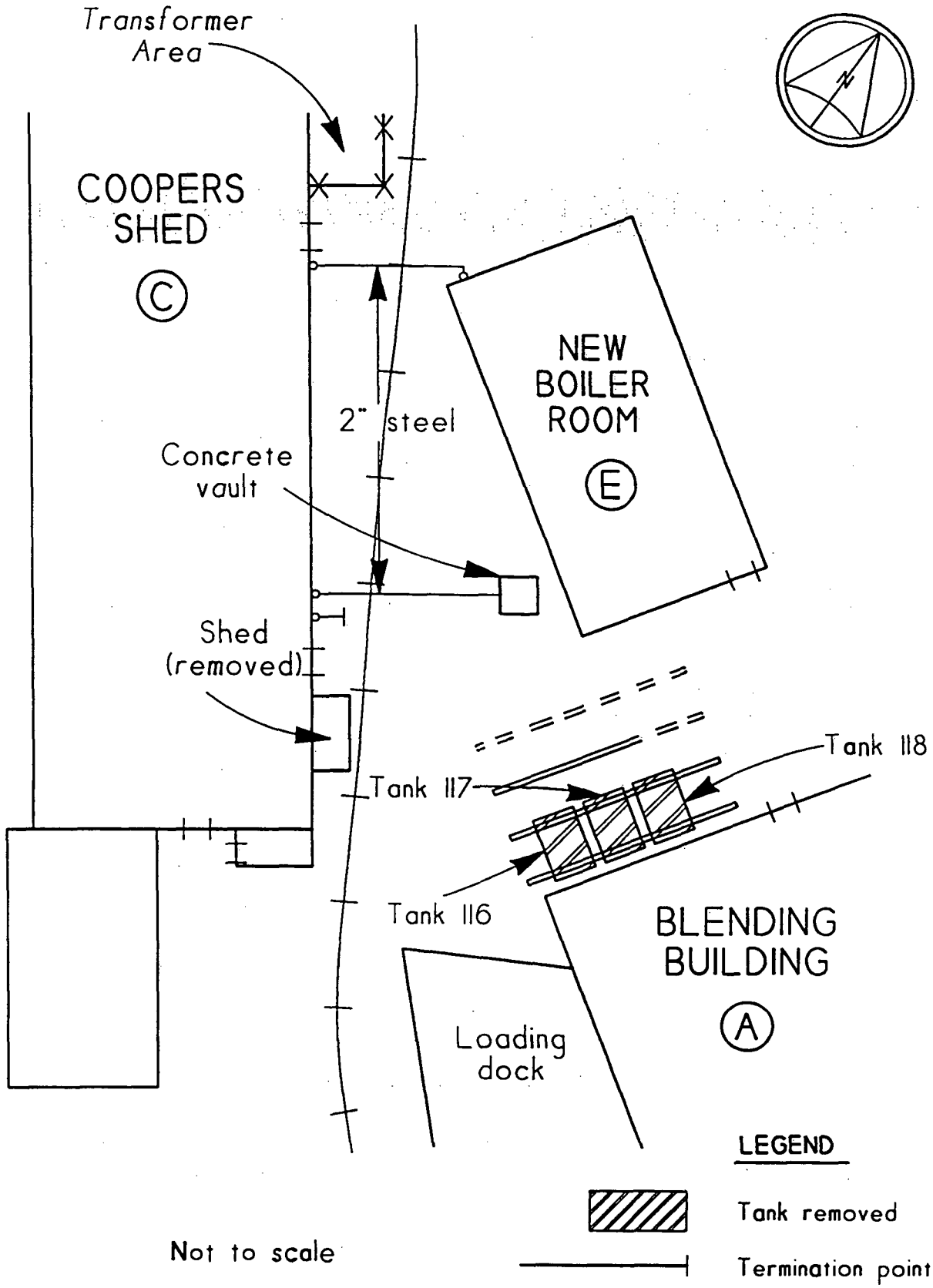


DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

PIPING UNDER CONCRETE ALONG BUILDING A

BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-0031IH
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-1	DATE: 1/21/91

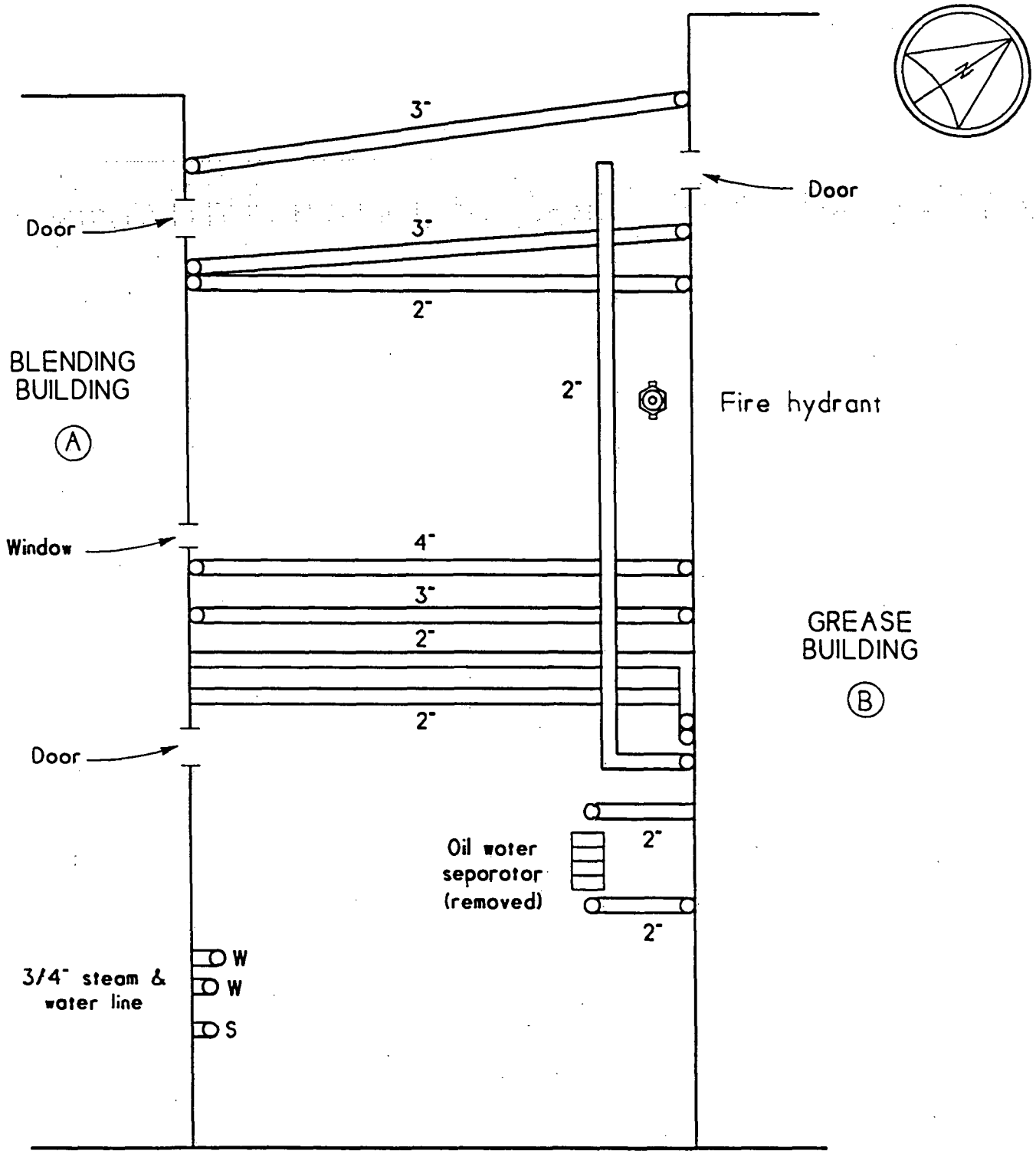


DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL. (201) 299-9001
FAX (201) 299-0021

PIPING BETWEEN BUILDING E AND BUILDING C

BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

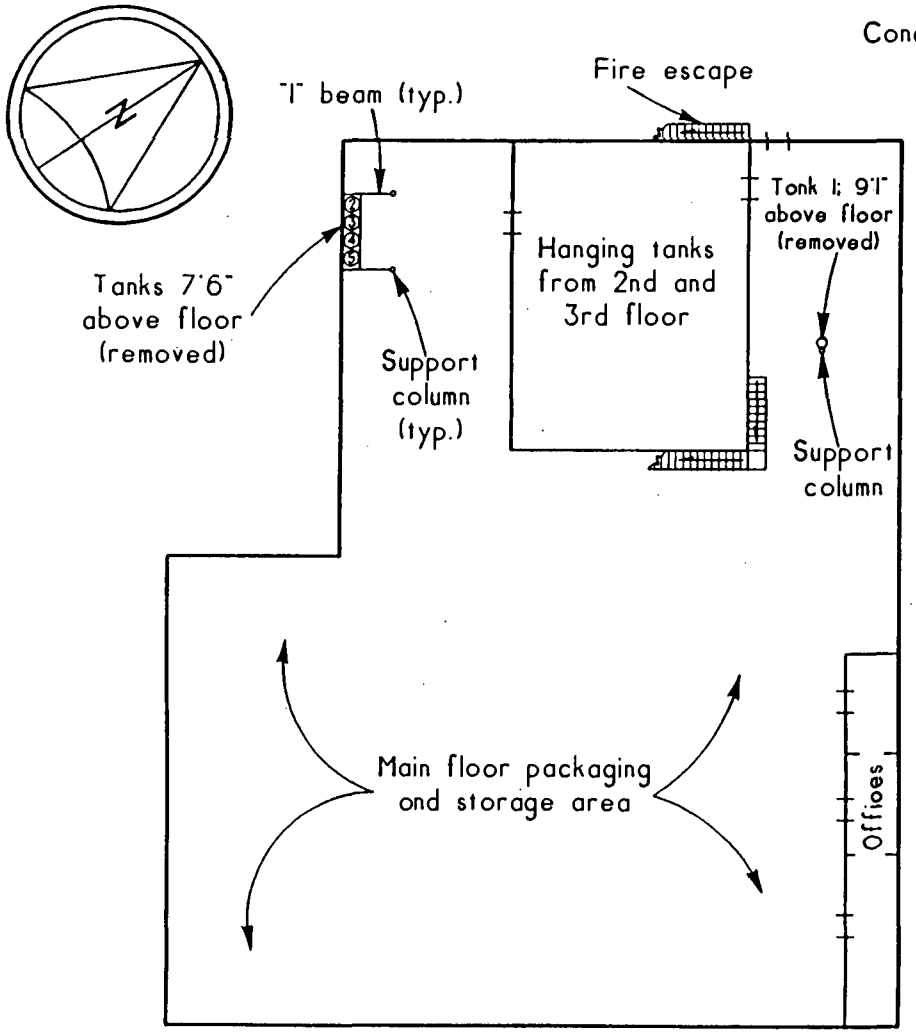
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-0031IJ
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-J	DATE: 7/29/91



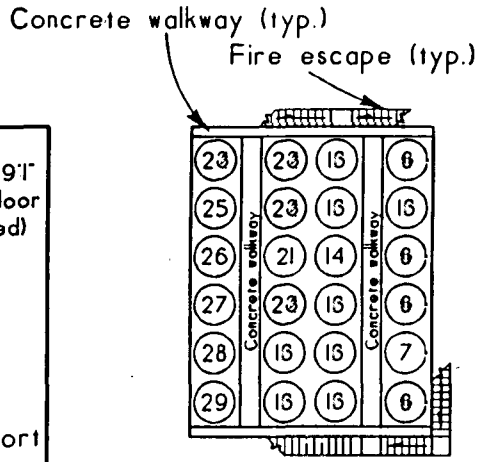
BUILDING A & B
STORAGE AND
LOADING DOCK

Not to scale

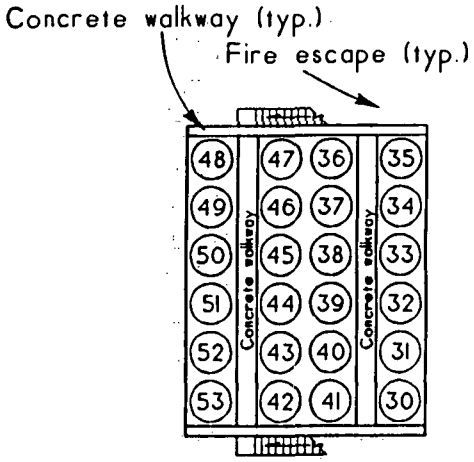
DONN GEOSCIENCE CORP. 299 CHERRY HILL ROAD PARSIPPANY. NEW JERSEY 07054 TEL. (201) 299-9001 FAX (201) 299-0021	PIPING A/B CORRIDOR BORNE CHEMICAL COMPANY ELIZABETH. NEW JERSEY			
	PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-003III
	PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 2-B	DATE: 1/21/91



FIRST FLOOR



SECOND FLOOR



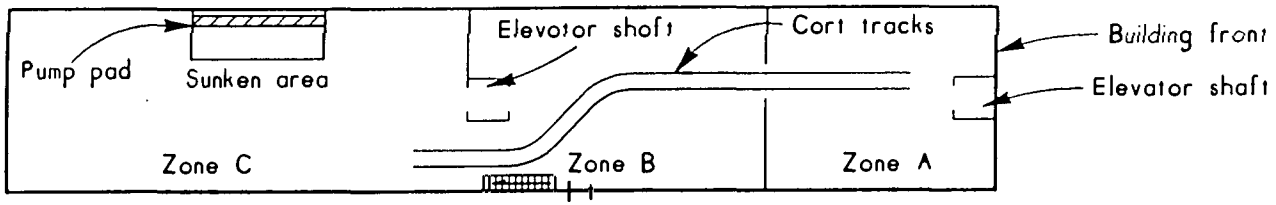
THIRD FLOOR

NOT TO SCALE

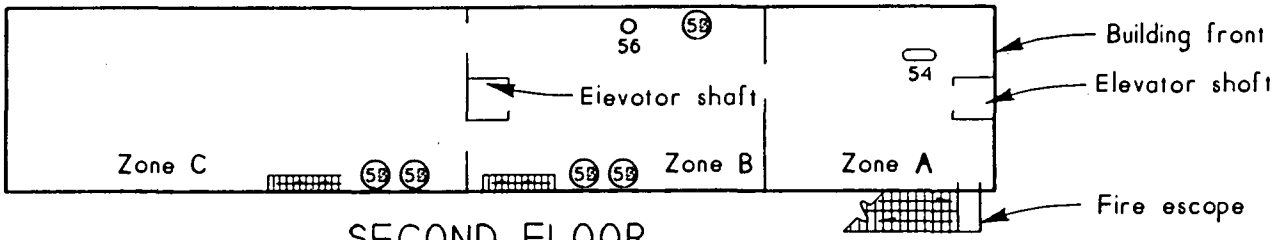
DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL (201)-299-9001
FAX (201)-299-0021

BUILDING A LAYOUT AND TANK LOCATION
BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

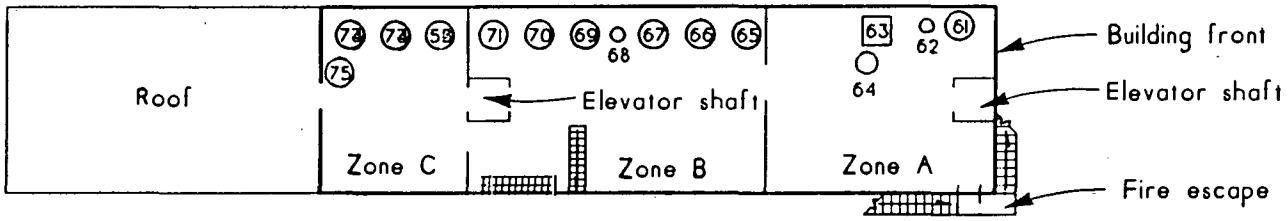
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-00466
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 3	DATE: 7/29/91



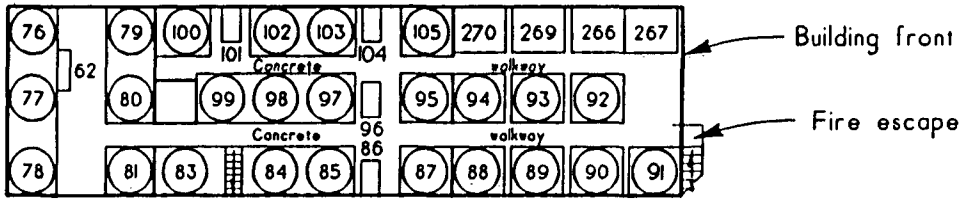
FIRST FLOOR



SECOND FLOOR



THIRD FLOOR



FOURTH FLOOR

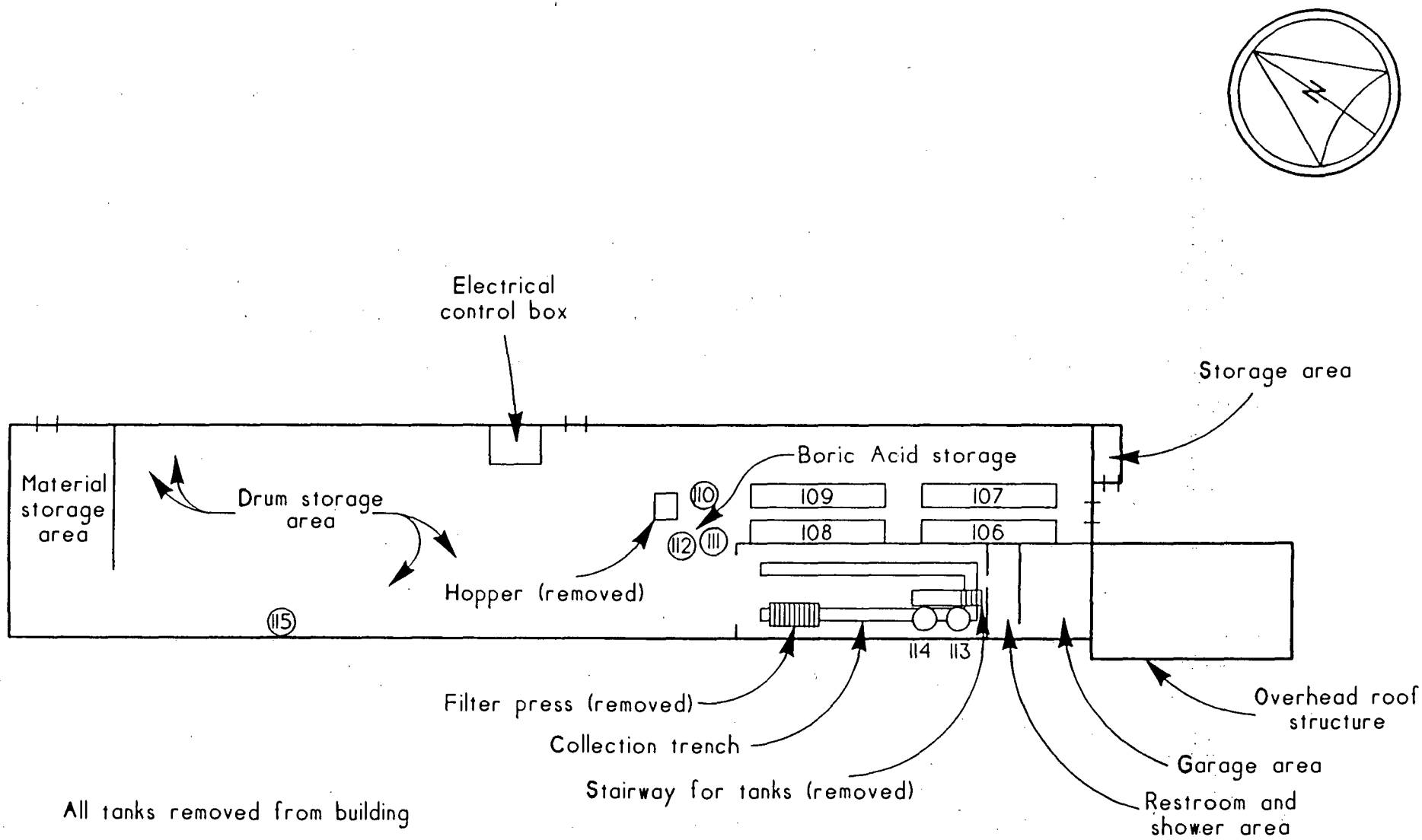
NOT TO SCALE

DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL (201)-299-9001
FAX (201)-299-0021

BUILDING B LAYOUT AND TANK LOCATION

BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

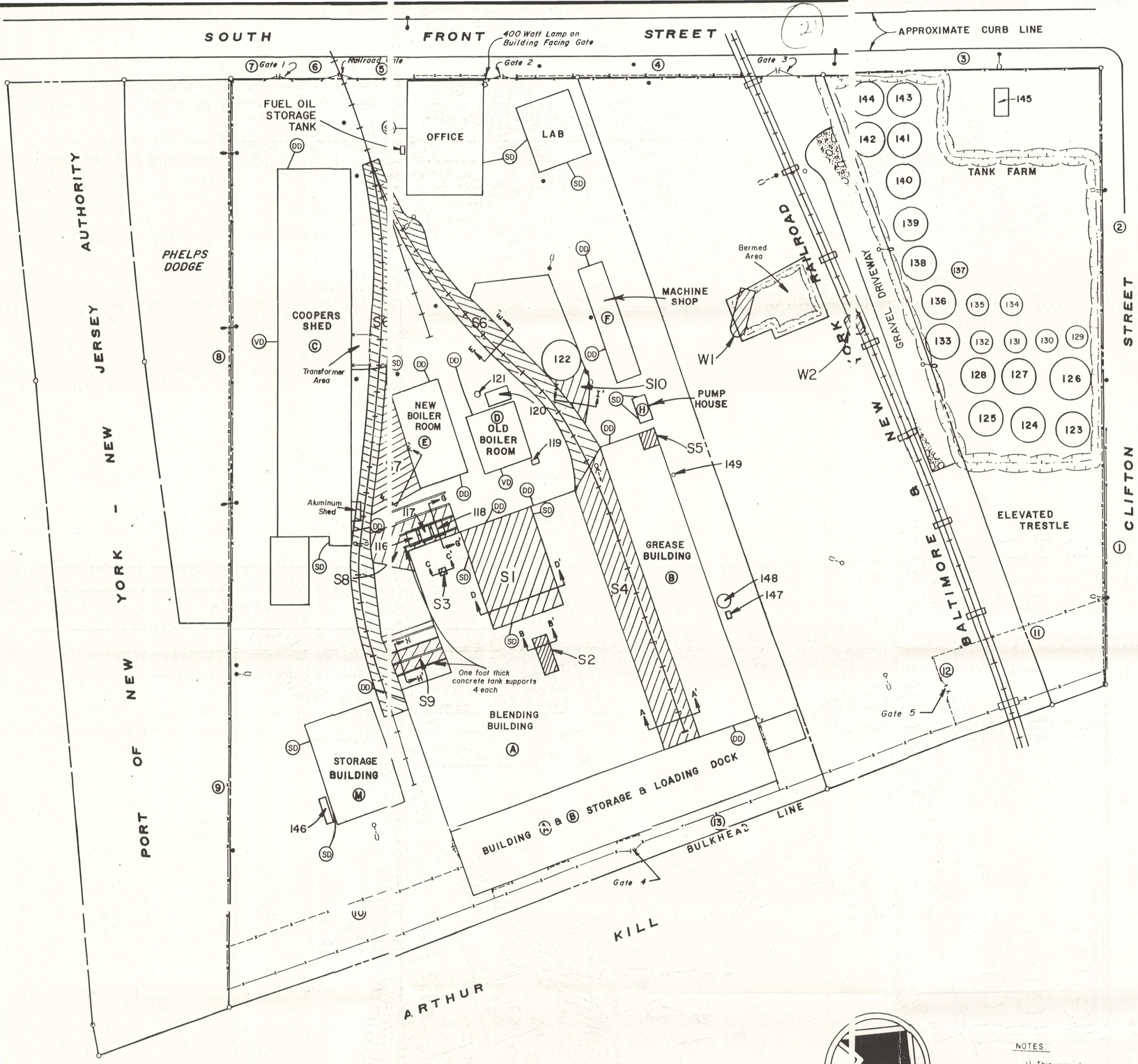
PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-00467
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 4	DATE: 7/29/91



DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL (201)-299-9001
FAX (201)-299-0021

BUILDING C LAYOUT AND TANK LOCATION
BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

PROJ. MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-00468
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 5	DATE: 7/29/91



SYMBOL KEY

- Existing Poles
- Installed Poles
- Existing 250 Watt Street Lamp
- Installed 250 Watt Street Lamp
- Berm
- Existing Fence
- Installed Fence
- Existing Gate
- Installed Gate
- Installed New Fence
- (2) Fence Run Number

APPROXIMATE LOCATION of OPERABLE DOORS

- (SD) Single Door
- (DD) Double Door
- (VD) Vehicular Door

STAINED SOIL AREAS

S-1	55' x 75'	4125 SF	
S-2	12' x 30'	360 SF	
S-3	5' x 5'	25 SF	
S-4	28' x 215'	6020 SF	
S-5	12' x 12'	144 SF	
S-6	12' x 700 L.F.	8400 SF	(Along railroad center-line)
S-7	Triangular	2010 SF	
S-8	21' x 70'	1470 SF	
S-9	18' x 40'	720 SF	
S-10	Triangular	600 SF	
		23,874 SF	

W-1	9' x 33' x 5' High Waste Pile	55 C.Y.
W-2	10' x 16' x 3' High Waste Pile	18 C.Y.
		73 C.Y.

A A' Cap Cross-Section Detail

NOTES

1) This map is not intended to be used for engineering or design purposes. It is for informational purposes only.
2) This area can be found on the USGS 7.5 min. quadrangle Elizabeth, N.J.
3) Property lines are approximate and are based on the Town of Elizabeth tax map.

DATE	REVISIONS	BY
3/1/89	Lighting	MDZ
4/6/89	Revised Lighting	PN
8/21/89	Revised Site Plan	PN
6/5/90	Stained Soil Area	PN
6/15/90	Soil Area Revised (NJDEP Visit)	PN

DUNN GEOSCIENCE CORPORATION
299 CHERRY HILL ROAD
PARSIPPANY, NJ 07054

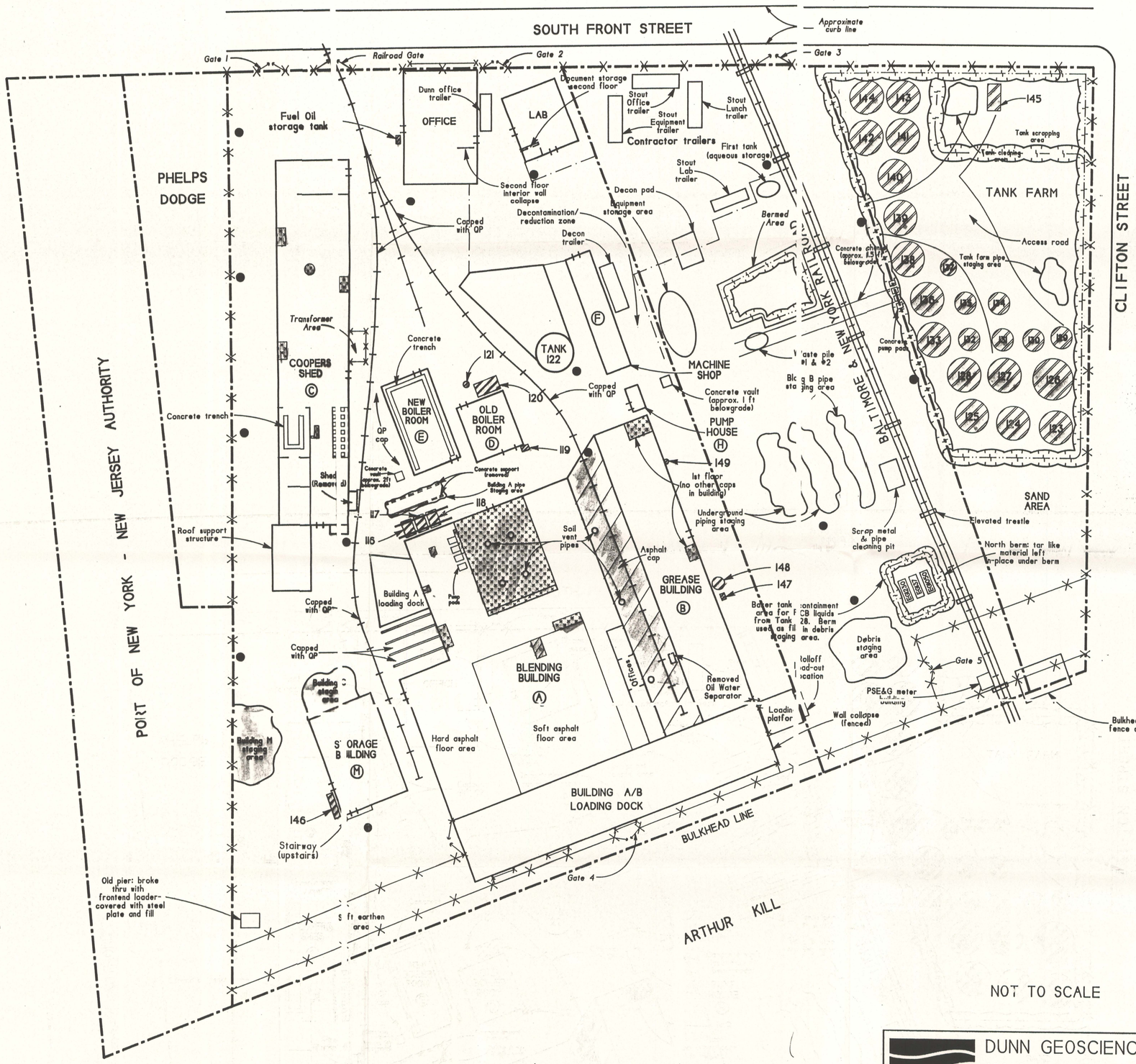
FIGURE 6

SOIL CAPPING
BORNE CHEMICAL COMPANY
TOWN OF ELIZABETH – UNION COUNTY, N.J.

PROJ. MANAGER: Paul Nienaber
PREPARED BY: Paul Nienaber
DRAFTED BY: Robert W. Shuey
CHECKED BY:

PROJECT NO. 9045-03-0088
MAP NO. 26
DATE: Aug. 5, 1988

SCALE: IN FEET
0 10 20 40 80



LEGEND

- Property line
- Fence line
- Berm
- Building access
- Asphalt cap
- Concrete cap
- Vermiculite area
- Tank removed
- Hot line demarcation fence
- Utility lighting pole

NOT TO SCALE

(8)

DUNN GEOSCIENCE CORP.
299 CHERRY HILL ROAD
PARSIPPANY, NEW JERSEY 07054
TEL (201)-299-9001
FAX (201)-299-0021

RECORD DRAWING
BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY

PROJECT MANAGER: P. NIENABER	DRAFTED BY: M. BRUGGEMANN	PROJECT NO.: 90045-00088	DRAWING NO.: 9-00304
PREPARED BY: M. CAINE	CHECKED BY:	FIGURE 7	DATE: 7/2/91

REFERENCE NO. 15

O/C
9/21

T

NJ DEP

:VAL & RISK ASSESSMENT

HANOVER STREET

ON, NJ 08625

Chain es Cu		for BTC Data Managament Sdmmary Reports				
F6940		NJDBORNE	SRRSED	841003		
ETC Sample No.		Pacifiay	Sample Poins	Date	Time	Elapsed Hours

Karen J. Kotz-Gebel/for
Denis C. K. Lin, Ph.D.
Vice President
Besearch and Dpcratioee

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Methodology Summary

Table 1 Results and Quality Assurance Data

Table 2 Method Performance Data

Report Appendices

Appendix A – Mass Spectral Data for Quantitated Compounds

Appendix B – GC/MS Calibration Data – Forms IX and X

Appendix C – Mass Spectral Data for Tentatively Identified Compounds

Appendix C1 – GC/MS Subsidiary Data – Blank Chromatograms

Appendix D – Subcontractor's Data

Appendix E – Chain of Custody Forms

Methodology Summary
Based on October, 1984 version of
ETC Standard Operating Procedures

NJDEP Contract 029

Aqueous Simple Preparation

Flame, ICP Sample Preparation	AA-001-1
Furnace Sample Preparation	AA-001-2
Mercury Sample Preparation	AA-001-3
Hexavalent Chromium Sample Preparation	AA-005-1

Non-Aqueous Extractions

Soil and Sediment Samples

Flame, ICP Sample Preparation	AA-002-1
Furnace Sample Preparation	AA-002-2
Mercury Sample Preparation	AA-002-3
Hexavalent Chromium Sample Preparation	AA-005-2

Sludge/Petroleum Based Samples

Flame, ICP Sample Preparation	AA-003-1 & 1A
Furnace Sample Preparation	AA-003-2 & 2A
Mercury Sample Preparation	AA-003-3
Hexavalent Chromium Sample Preparation	See AA-005-2

Flame AA or ICP

Aluminum	IM-1-001
Antimony	IM-1-002
Barium	IM-1-003
Beryllium	IM-1-004
Cadmium	IM-1-005
Chromium	IM-1-006
Cobalt	IM-1-007
Copper	IM-1-008
Iron	IM-1-009
Lead	IM-1-010
Manganese	IM-1-011
Molybdenum	IM-1-012
Nickel	IM-1-013
Potassium	IM-1-014
Silver	IM-1-015
Sodium	IM-1-016
Tin	IM-1-017
Vanadium	IM-1-018
Zinc	IM-1-019
Flame Operating Parameters	Table I
ICP Operating Parameters	Table 2
ICP Interferents	Table 3

Furnace AA

Arsenic	IM-2-001
Selenium	IM-2-002
Thallium	IM-2-003
Furnace Operating Parameters	Table I

Aqueous Methodologies

Organochlorine Pesticides and PCB's by Gas Chromatography	GC-1-001
Herbicides by Gas Chromatography	GC-1-002
Purgeable Organics by GC/MS	GC/MS-1-001
Base/Neutral, Acids and Pesticides by GC/MS	GC/MS-1-002
2,3,7,8-TCDD by GC/MS	GC/MS-1-003

Non-Aqueous Methodologies

Gas Chromatography/Mass Spectrometry for:

Purgeable Organics	GC/MS-2-001
Base/Neutral and Acid Extractables	GC/MS-2-002

Includes:
- Benzidines
- Chlorinated Hydrocarbons
- Haloethers
- Nitroaromatic and Cyclic Ketones
- Organochlorine Pesticides
- Polychlorinated Biphenyls
- Phthalate Esters
- Polynuclear Aromatic Hydrocarbons
- Nitrosamines
- Phenols

2,3,7,8-TCDD Screen	GC/MS-2-003
2,3,7,8-TCDD	GC/MS-2-004
PCB's	GC/MS-2-005

Non-Aqueous

pH measurement	C-2-001
Reactivity	C-2-002
Corrosivity	C-2-003
Ignitability	C-2-004
EP Toxicity Extraction	C-2-005

Comments

Volatiles:

GC/MS-2-001 method could not be used. Method of tetraglyme extraction from SW-846, July 1982 was used for extraction prior to purge and trap analysis. There is no official holding time for an organic matrix sample.

Base/Neutrals:

Low level determination was used and the samples were found to contain high levels of organics. Reanalysis of this fraction at the medium level is presently being done. This fraction's data reported here is preliminary. Final data will be issued in the future.

Acids:

Surrogates were out due to the fact that the extract contained heavy amounts of precipitate and had to be diluted to allow sample injection. As told to Nancy Fox, repeat of this sample at low level would result in the same physical matrix problem, and repeat at high level to obtain surrogates within detection limits would eliminate the quantification of low level organic compound hits.

PCB's:

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 16, 1904

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Volatile Compounds – GC/MS Analysis Data (GR01)

0005

Chain of Custody Data Required for CTC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Site	Time	Elapsed Hours
F6940	NJ DEP	NJDBORNE	SRRBED	841003		

NPDES Number	Compound	Results: Sample Concen. ug/kg	Results: MDL ug/kg	QC Replicate: First ug/kg	QC Replicate: Second ug/kg	QC Blank and Spiked Blank: Blank Data ug/kg	QC Blank and Spiked Blank: Concen. Added ug/kg	QC Blank and Spiked Blank: % Recov	QC Matrix Spike: Unspiked Sample ug/kg	QC Matrix Spike: Concen. Added ug/kg	QC Matrix Spike: % Recov
1V	Acrolein	ND	0000	ND	ND	ND	00000	111	ND	00000	107
2V	Acrylonitrile	ND	5000	ND	ND	ND	0000	70	ND	0000	73
3V	Benzene	BMDL	500	201	290	ND	1000	112	23	1800	125
4V	bis(Chloromethyl)ether	ND	500	ND	ND	ND	0	-	ND	0	-
5V	Bromoform	ND	500	ND	ND	ND	1000	118	ND	1000	70
6V	Carbon tetrachloride	ND	500	ND	ND	ND	1800	89	ND	1800	119
7V	Chlorobenzene	ND	500	ND	ND	BMDL	1800	92	ND	1800	103
8V	Chlorodibromomethane	ND	500	ND	ND	ND	1800	118	ND	1800	101
9V	Chloroethane	ND	500	ND	ND	ND	1000	111	ND	1800	111
10V	2-Chloroethylvinyl ether	ND	500	ND	ND	ND	1800	102	ND	1800	138
11V	Chloroform	BMDL	500	90	60	ND	1800	108	3	1800	120
12V	Dichlorobromomethane	ND	500	ND	ND	ND	1800	95	ND	1800	132
13V	Dichlorodifluoromethane	ND	500	ND	ND	ND	0	-	ND	0	-
14V	1,1-Dichloroethane	ND	500	ND	ND	ND	1800	109	ND	1800	126
15V	1,2-Dichloroethane	ND	500	ND	ND	ND	1000	109	ND	1800	123
16V	1,1-Dichloroethylene	ND	500	ND	ND	ND	1800	109	ND	1800	119
17V	1,2-Dichloropropane	ND	800	ND	ND	ND	1800	113	ND	1800	129
18V	cis-1,3-Dichloropropylene	ND	500	ND	ND	ND	1800	112	ND	1800	128
19V	Ethylbenzene	BMDL	500	170	100	ND	1800	111	ND	1800	129
20V	Methyl bromide	ND	500	ND	ND	ND	1800	109	ND	1800	88
21V	Methyl chloride	ND	500	ND	ND	ND	1800	118	ND	1800	64
22V	Methylene chloride	1190	500	1360	1190	BMDL	1800	92	1139	1800	0
23V	1,1,2,2-Tetrachloroethane	ND	500	ND	ND	ND	1800	118	ND	1800	101
24V	Tetrachloroethylene	BMDL	500	354	73	ND	1800	113	50	1800	100
25V	Toluene	550	500	1290	850	BMDL	1800	99	141	1800	140
26V	1,2-Trans-dichloroethylene	ND	500	ND	ND	ND	1800	110	ND	1800	124
27V	1,1,1-Trichloroethane	580	500	700	680	ND	1800	83	17	1800	158
28V	1,1,2-Trichloroethane	ND	500	ND	ND	ND	1800	116	ND	1800	110
29V	Trichloroethylene	ND	500	ND	ND	ND	1800	112	ND	1800	116
30V	Trichlorofluoromethane	ND	500	ND	ND	ND	1800	111	ND	1800	108
31V	Vinyl chloride	ND	600	ND	ND	ND	1800	112	ND	1800	84
18V	trans-1,3-Dichloropropylene	ND	500	ND	ND	ND	1800	109	ND	1800	129

* ETC estimated Method Detection Limit for this particular matrix.

* Spike samples that contain compounds present at high levels do not provide valid spike recovery data.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 21, 1984

QUALITY ASSURANCE DATA

Relative Percent Difference (RPD) for Volatile Compounds

000

Cr.

F6936, F6937, F6938, F6939, F6940

ETC Sample No.

NPDES Number	Compound	RPD									
1V	Acrolein	0									
2V	Acrylonitrile	0									
3V	Benzene	9.6									
4V	bis(Chloromethyl)ether	0									
5V	Bromoform	0									
6V	Carbon tetrachloride	0									
7V	Chlorobenzene	0									
8V	Chlorodibromomethane	0									
9V	Chloroethane	0									
10V	2-Chloroethylvinyl ether	0									
11V	Chloroform	40									
12V	Dichlorobromomethane	0									
13V	Dichlorodifluoromethane	0									
14V	1,1-Dichloroethane	0									
15V	1,2-Dichloroethane	0									
16V	1,1-Dichloroethylene	0									
17V	1,2-Dichloropropane	0									
18V	1,3-Dichloropropylene	0									
19V	Ethylbenzene	51.8									
20V	Methyl bromide	0									
21V	Methyl chloride	0									
22V	Methylene chloride	13.3									
23V	1,1,2,2-Tetrachloroethane	0									
24V	Tetrachloroethylene	131.6									
25V	Toluene	41.1									
26V	1,2-Trans-dichloroethylene	0									
27V	1,1,1-Trichloroethane	18.75									
28V	1,1,2-Trichloroethane	0									
29V	Trichloroethylene	0									
30V	Trichlorofluoromethane	0									
31V	Vinyl chloride	0									

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 10, 1984

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Acid Compounds - GC/MS Analysis Data (QR02)

0007

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
F6940	NJ DEP	NJDBORNE	SRRBED	841003		

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen. Added ug/kg	% Recov
1A	2-Chlorophenol	ND	2500	ND	ND	ND	3000	94	ND	3000	13
2A	2,4-Dichlorophenol	ND	2500	ND	ND	ND	3000	73	ND	3000	13
3A	2,4-Dimethylphenol	ND	2500	ND	ND	ND	3000	104	ND	3000	3
4A	4,6-Dinitro-o-cresol	ND	25000	ND	ND	ND	5000	81	ND	5000	0
5A	2,4-Dinitrophenol	ND	20000	ND	ND	ND	6000	97	ND	5000	0
6A	2-Nitrophenol	ND	2500	ND	ND	ND	3000	105	ND	3000	0
7A	4-Nitrophenol	ND	2500	ND	ND	ND	3000	47	ND	3000	20
8A	p-Chloro-m-cresol	ND	2500	ND	ND	ND	3000	94	ND	3000	9
9A	Pentachlorophenol	ND	2500	ND	ND	ND	3000	49	ND	3000	23
10A	Phenol	ND	2500	ND	ND	ND	3000	53	ND	3000	13
11A	2,4,6-Trichlorophenol	ND	2500	ND	ND	ND	3000	93	ND	3000	12

a ETC specified Method detection limit for this particular compound.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 21, 1984

QUALITY ASSURANCE DATA

Relative Percent Difference (RPD) for Acid Compounds

0008

F6936, F6937, F6938, P6939, F6940

ETC Sample No.

NPDES Number	Compound	RPD									
1A	2-Chlorophenol	0									
2A	2,4-Dichlorophenol	0									
3A	2,4-Dimethylphenol	0									
4A	4,6-Dinitro-o-cresol	0									
5A	2,4-Dinitrophenol	0									
6A	2-Nitrophenol	0									
7A	4-Nitrophenol	0									
0A	p-Chlero-m-eresol	0									
9A	Pentachlorophenol	0									
10A	Phenol	0									
11A	2,4,6-Trichlorophenol	0									

ETC ENVIRONMENTAL TESTING and CERTIFICATION

DCT 24, 1984

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS - GC/MS ANALYSIS DATA (QR03)

6000

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
F6940	NJ DEP	NJDBORNE	SRRBED	841003		

NPDES Number	Compound	Ratulia Sample Concen. ug/kg	Ratulia MDL ug/kg	QC Replicate First ug/kg	QC Replicate Second ug/kg	QC Blank and Spiked Blank Blank Data ug/kg	QC Blank and Spiked Blank Concen. Added ug/kg	QC Blank and Spiked Blank % Recov	QC Matrix Spike Unspiked Sample ug/kg	QC Matrix Spike Concen. Added ug/kg	QC Matrix Spike % Recov
1B	Acenaphthene	BMDL	8000	ND	ND	ND	1902	107	ND	1892	56
2B	Acenaphthylene	ND	8000	ND	ND	ND	1902	109	ND	1892	0
3B	Anthracene	ND	8000	ND	ND	ND	1902	122	ND	1892	0
4B	Benzidine	ND	8000	ND	ND	ND	1902	0	ND	1892	0
5B	Benzo(a)anthracene	ND	8000	ND	ND	ND	1902	130	ND	1892	0
6B	Benzo(a)pyrene	ND	8000	ND	ND	ND	1902	183	ND	1892	0
7B	Benzo(b)fluoranthene	ND	8000	ND	ND	ND	1902	157	ND	1892	0
8B	Benzo(ghi)perylene	ND	8000	ND	ND	ND	0	-	ND	0	-
9B	Benzo(k)fluoranthene	ND	8000	ND	ND	ND	1902	172	ND	1892	0
10B	bis(2-Chloroethoxy)methane	ND	8000	ND	ND	ND	1902	108	ND	1892	48
11B	bis(2-Chloroethyl) ether	ND	8000	ND	ND	ND	1902	00	ND	1902	05
12B	bis(2-Chloroisopropyl)ether	ND	8000	ND	ND	ND	1902	90	ND	1892	124
13B	bis(2-Ethylhexyl)phthalate	1.0E+05	8000	ND	ND	BMDL	1902	130	ND	1892	0
14B	4-Bromophenyl phenyl ether	ND	8000	ND	ND	ND	1902	92	ND	1892	0
15B	Butyl benzyl phthalate	ND	8000	ND	ND	ND	1902	137	ND	1892	0
16B	2-Chloronaphthalene	ND	8000	ND	ND	ND	1902	56	ND	1892	51
17B	4-Chlorophenyl phenyl ether	ND	8000	ND	ND	ND	1902	111	ND	1892	71
18B	Chrysene	ND	8000	ND	ND	ND	1902	137	ND	1892	0
19B	Dibenzo(a,h)anthracene	ND	8000	ND	ND	ND	0	-	ND	0	-
20B	1,2-Dichlorobenzene	ND	8000	ND	ND	ND	1902	63	ND	1892	80
21B	1,3-Dichlorobenzene	ND	8000	ND	ND	ND	1902	56	ND	1892	59
22B	1,4-Dichlorobenzene	ND	8000	ND	ND	ND	1902	59	ND	1892	54
23B	3,3'-Dichlorobenzidine	ND	8000	ND	ND	ND	1902	117	ND	1892	0
24B	Diethyl phthalate	ND	8000	ND	ND	ND	1902	38	ND	1892	0
25B	Dimethyl phthalate	BMDL	8000	ND	ND	ND	1902	2	ND	1892	95
26B	Di-n-butyl phthalate	ND	8000	ND	ND	BMDL	1902	124	ND	1892	0
27B	2,4-Dinitrotoluene	ND	8000	ND	ND	ND	1902	86	ND	1892	0
28B	2,6-Dinitrotoluene	ND	8000	ND	ND	ND	1902	98	ND	1892	0
29B	Di-n-octyl phthalate	ND	8000	663	40300	ND	1902	173	40258	1892	0
30B	1,2-Diphenylhydrazine	ND	8000	ND	ND	ND	1902	102	ND	1892	0
31B	Fluoranthene	BMDL	8000	ND	ND	ND	1902	142	ND	1892	0
32B	Fluorene	BMDL	8000	ND	ND	ND	1902	103	ND	1892	0

ETC ENVIRONMENTAL TESTING and CERTIFICATION

OCT 24, 1984

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

BASE/NEUTRAL COMPOUNDS - GC/MS ANALYSIS DATA (QR03)

0010

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
F6940	NJ DEP	NJDBORNE	SRRBED	841003		

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen. Added ug/kg	% Recov
33B	Hexachlorobenzene	ND	8000	ND	ND	ND	1902	123	ND	1892	71
34B	Hexachlorobutadiene	ND	8000	ND	ND	ND	1902	90	ND	1892	0
35B	Hexachlorocyclopentadiene	ND	8000	ND	ND	ND	0	-	ND	0	-
36B	Hexachloroethane	ND	8000	ND	ND	ND	1902	61	ND	1892	0
37B	Indeno(1,2,3-c,d)pyrene	ND	8000	ND	ND	ND	0	-	ND	0	-
38B	Isophorone	ND	8000	ND	ND	ND	1902	120	ND	1892	209
39B	Naphthalene	BMDL	8000	ND	ND	ND	1902	85	ND	1892	69
40B	Nitrobenzene	ND	8000	ND	ND	ND	1902	101	ND	1692	0
41B	N-Nitrosodimethylamine	ND	8000	ND	ND	ND	0	-	ND	0	-
42B	N-Nitrosodi-n-propylamine	ND	8000	ND	ND	ND	1002	104	ND	1802	0
43B	N-Nitrosodiphenylamine	ND	4000	ND	ND	ND	1002	102	ND	1892	70
44B	Phenanthrene	BMDL	0000	ND	ND	ND	1002	121	ND	1892	0
45B	Pyrene	ND	8000	ND	ND	ND	1902	142	ND	1892	0
46B	1,2,4-Trichlorobenzene	ND	0000	ND	ND	ND	1902	152	ND	1892	172

* Sample concentrations exceed Calibration Limit for some surrogates or analyte.
† Large spread (max. value minus min. value) or SD or variable recoveries for spiked compounds.
‡ Recovery normally low using EPA Protocol Method 625.
§ Recovery normally variable among EPA Protocol Method 625.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 21, 1984

QUALITY ASSURANCE DATA

Relative Percent Difference (RPD) for Base/Neutral Compounds

001

F6936, F6937, F6938, F6939, F6940

Sample No.

NPDES Number	Compound	RPD									
1B	Acenaphthene	0									
2B	Acenaphthylene	0									
3B	Anthracene	0									
4B	Benzidine	0									
5B	Benzo(a)anthracene	0									
6B	Benzo(a)pyrene	0									
7B	Benzo(b)fluoranthene	0									
8B	Benzo(ghi)perylene	0									
9B	Benzo(k)fluoranthene	0									
10B	bis(2-Chloroethoxy)methane	0									
11B	bis(2-Chloroethyl) ether	0									
12B	bis(2-Chloroisopropyl)ether	0									
13B	bis(2-Ethylhexyl)phthalate	0									
14B	4-Bromophenyl phenyl ether	0									
15B	Butyl benzyl phthalate	0									
16B	2-Chloronaphthalene	0									
17B	4-Chlorophenyl phenyl ether	0									
18B	Chrysene	0									
19B	Dibenzo(a,h)anthracene	0									
20B	1,2-Dichlorobenzene	0									
21B	1,3-Dichlorobenzene	0									
22B	1,4-Dichlorobenzene	0									
23B	3,3'-Dichlorobenzidine	0									
24B	Diethyl phthalate	0									
25B	Dimethyl phthalate	0									
26B	Di-n-butyl phthalate	0									
27B	2,4-Dinitrotoluene	0									
28B	2,6-Dinitrotoluene	0									
29B	Di-n-octyl phthalate	194									
30B	1,2-Diphenylhydrazine	0									
31B	Fluoranthene	0									

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 21, 1984

QUALITY ASSURANCE DATA

Relative Percent Difference (RPD) for Base/Neutral Compounds

0012

F6936, F6937, F6938, F6939, F6940

ETC Sample No.

NPDES Number	Compound	RPD									
32B	Fluorene	0									
33B	Hexachlorobenzene	0									
34B	Hexachlorobutadiene	0									
35B	Hexachlorocyclopentadiene	0									
36B	Hexachloroethane	0									
37B	Indeno(1,2,3-c,d)pyrene	0									
38B	Isophorone	0									
39B	Naphthalene	0									
40B	Nitrobenzene	0									
41B	N-Nitrosodimethylamine	0									
42B	N-Nitrosodi-n-propylamine	0									
43B	N-Nitrosodiphenylamine	0									
44B	Phenanthrene	0									
45B	Pyrene	0									
46B	1,2,4-Trichlorobenzene	0									

ETC ENVIRONMENTAL TESTING and CERTIFICATION

OCT 24, 1984

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Pesticide/PCB Compounds - GC/MS Analysis Data (QR04)

0013

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
F6940	NJ DEP	NJDBORNE	SRRBED	841003		

NPDES Number	Compound	Results		QC Replicate		QC Blank and Spiked Blank			QC Matrix Spike		
		Sample Concen. ug/kg	MDL ug/kg	First ug/kg	Second ug/kg	Blank Data ug/kg	Concen. Added ug/kg	% Recov	Unspiked Sample ug/kg	Concen. Added ug/kg	% Recov
1P	Aldrin	ND	0000	ND	ND	ND	1902	96	ND	1892	0
2P	Alpha-BHC	ND	8000	ND	ND	ND	1902	60	ND	1892	0
3P	Beta-BHC	ND	8000	ND	ND	ND	1902	89	ND	1892	0
4P	Gamma-BHC	ND	8000	ND	ND	ND	1902	65	ND	1892	0
5P	Delta-BHC	ND	8000	ND	ND	ND	1902	43	ND	1892	0
6P	Chlordane	ND	8000	ND	ND	ND	3804	121	ND	3784	0
7P	4,4'-DDT	ND	8000	ND	ND	ND	1902	87	ND	1892	0
8P	4,4'-DDE	ND	8000	ND	ND	ND	1002	103	ND	1892	0
9P	4,4'-DDD	ND	0000	ND	ND	ND	1902	85	ND	1892	0
10P	Dieldrin	ND	8000	ND	ND	ND	1902	90	ND	1892	0
11P	Endosulfan I	ND	8000	ND	ND	ND	1902	106	ND	1892	0
12P	Endosulfan II	ND	8000	ND	ND	ND	1902	0	ND	1892	0
13P	Endosulfan sulfate	ND	8000	ND	ND	ND	1902	90	ND	1892	0
14P	Endrin	ND	8000	ND	ND	ND	1902	109	ND	1892	0
15P	Endrin aldehyde	ND	8000	ND	ND	ND	1902	12	ND	1892	0
16P	Heptachlor	ND	8000	ND	ND	ND	1902	92	ND	1892	0
17P	Heptachlor epoxide	ND	8000	ND	ND	ND	1902	86	ND	1892	0
18P	PCB-1242	ND	8000	ND	ND	ND	0	-	ND	0	-
19P	PCB-1254	ND	8000	ND	ND	ND	0	-	ND	0	-
20P	PCB-1221	ND	8000	ND	ND	ND	0	-	ND	0	-
21P	PCB-1232	ND	8000	ND	ND	ND	0	-	ND	0	-
22P	PCB-1248	ND	8000	ND	ND	ND	0	-	ND	0	-
23P	PCB-1260	ND	8000	ND	ND	ND	1902	90	ND	1892	0
24P	PCB-1016	ND	8000	ND	ND	ND	0	-	ND	0	-
25P	Toxaphene	ND	6000	ND	ND	ND	0	-	ND	0	-

* [illegible] detection limit for this particular sample.
* Recovery normally acceptable using the Protocol method 81%.
* Large percent (low) recovery indicative of [illegible] spiked compounds.

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 21, 1984

QUALITY ASSURANCE DATA

Relative Percent Difference (RPD) for Pesticide/PCB Compounds

0014

F6936, F6937, F6938, F6939, F6940

ETC Sample No.

NPDES Number	Compound	RPD									
1P	Aldrin (GC/MS)	0									
2P	Alpha-BHC (GC/MS)	0									
3P	Beta-BHC (GC/MS)	0									
4P	Gamma-BHC (GC/MS)	0									
5P	Delta-BHC (GC/MS)	0									
6P	Chlordane (GC/MS)	0									
7P	4,4'-DDT (GC/MS)	0									
8P	4,4'-DDE (GC/MS)	0									
9P	4,4'-DDD (GC/MS)	0									
10P	Dieldrin (GC/MS)	0									
11P	Endosulfan I (GC/MS)	0									
12P	Endosulfan II (GC/MS)	0									
13P	Endosulfan sulfate (GC/MS)	0									
14P	Endrin (GC/MS)	0									
15P	Endrin aldehyde (GC/MS)	0									
16P	Heptachlor (GC/MS)	0									
17P	Heptachlor epoxide (GC/MS)	0									
18P	PCB-1242 (GC/MS)	0									
19P	PCB-1254 (GC/MS)	0									
20P	PCB-1221 (GC/MS)	0									
21P	PCB-1232 (GC/MS)	0									
22P	PCB-1248 (GC/MS)	0									
23P	PCB-1260 (GC/MS)	0									
24P	PCB-1016 (GC/MS)	0									
25P	Toxaphene (GC/MS)	0									

ETC ENVIRONMENTAL TESTING and CERTIFICATION

NOV 18, 1984

TABLE 1: QUANTITATIVE RESULTS and QUALITY ASSURANCE DATA

Metals, Cyanide and Phenols - Analysis Data (QR05)

0015

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
F6940	NJ DEP	NJDBORNE	SRRBED	841003		

NPDES Number	Compound	Results: Sample Concen. mg/kg	Results: MDL mg/kg
1M	Antimony	8.00	5
2M	Arsenic	45	7
3M	Beryllium	.60	.50
4M	Cadmium	8.40	.50
5M	Chromium	62	.70
6M	Copper	630	.99
7M	Lead	290	6
8M	Mercury	2.00	.10
9M	Nickel	77	.90
10M	Selenium	BMDL	3
11M	Silver	.70	.60
12M	Thallium	BMDL	3
13M	Zinc	390	.60
14M	Cyanide, Total	<.50	.50
15M	Phenolics, Total	83	.10

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 18, 1984

TABLE 1: QUALITATIVE RESULTS

Tentatively Identified Organic Compounds - GC/MS Analysis Data - Volatile Fraction (QR06)

0015

Chain of Custody Data Required for ETC Data Management Summary Reports

F6940	NJDEP	NJDBORNE	SRRBED	841003		
S/O Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours

Compound Name	Data			Identifiers				
	Scan Number	Retention Time (Min)	M.W.	CAS Number	Empirical Formula	Estim. Conc. ug/kg		
1 No Hit	49	3.12	-	-	-	-		
2 Acetone	138	6.58	58	67641	C_3H_6O	680		
3 No Hit	165	7.63	-	-	-	-		
4 1,3-Dioxolane	186	8.44	74	646060	$C_3H_6O_2$	620		
5 Cyclohexane	333	14.15	84	110827	C_6H_{12}	29000		
6 No Hit	412	17.21	-	-	-	-		

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 10, 1984

TABLE 1: QUALITATIVE RESULTS

Tentatively Identified Organic Compounds - GC/MS Analysis Data - Acid Fraction (QR07)

0017

Chain of Custody Data Required for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
F6940	NJ DEP	NJDBORNE	SRRBED	841003		

Compound Name	Data			Identifiers				
	Scan Number	Retention Time (Min)	M.W.	CAS Number	Empirical Formula			
None Found								

ETC ENVIRONMENTAL TESTING and CERTIFICATION

October 22, 1984

TABLE 1: QUALITATIVE RESULTS

Tentatively Identified Organic Compounds – GC/MS Analysis Data – Base/Neutral Fraction (QR08)

0018

Chain of Custody Data Acquired for ETC Data Management Summary Reports

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours
F6940	NJDEP	NJOBORNE	SRRBED	841003		

Compound Name	Data			Identifiers				
	Scan Number	Retention Time (Min)	M.W.	CAS Number	Empirical Formula	Estim. Concen. ug/kg		
1 1-Hexene, 5,B-dimethyl	174	5.96	112	7)16861	C_8H_{16}	7620		
2 Benzene, 1 ethyl-2,4 dimethyl	207	6.55	134	874419	$C_{10}H_{14}$	8250		
3 Ethanone, 2-hydroxy-1 phenyl	246	7.24	136	582241	$C_8H_8O_2$	86500		
4 Silane, dichlorofluoromethyl	306	8.30	132	420586	CH_3Cl_2FSI	7920		
5 Tridecane, 5-propyl	774	16.57	226	65045119	$C_{16}H_{34}$	10370		
6 Nonadecane	901	18.82	269	629925	$C_{19}H_{40}$	54900		

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 16, 1984

TABLE 2: METHOD PERFORMANCE DATA

Surrogate Recovery Soil- GC/MS Data (QR20)

0019

Chain of Custody Data Required for ETC Data Management Summary Reports

F6940

ETC Sample No.	Category	Facility	Sample Point	Date	Time	Elapsed Hours

Compound	Amount Added ug	% Recovery	Control Limits * Lower	Control Limits * Upper
VOLATILE FRACTION				
Toluene-D5	.250	06	50	160
Bromofluorobenzene	.260	81	60	160
1,2-Dichloroethane-D4	.250	91	50	160
ACID FRACTION **				
Phenol-D5	100	0	20	140
2-Fluorophenol	100	0	20	140
2,4,6-Tribromophenol	100	0	10	140
BASE/NEUTRAL FRACTION				
Nitrobenzene-D5	50	11 ***	20	140
2-Fluorobiphenyl	60	40	20	140
Terphenyl-D14	50	90	20	150

* WS EPA Control Limits.
** Low Surrogate recovery due to sample matrix interference.
*** Variable recovery due to large extract final volume.

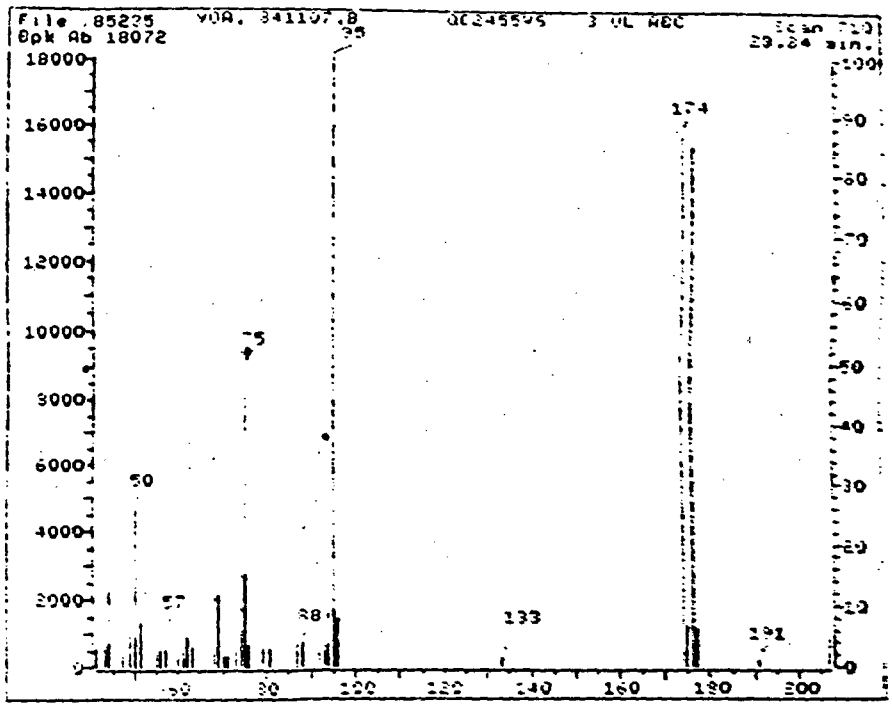

TABLE 2. METHOD PERFORMANCE DATA (OR21)

GC/MS Tuning Data - Bromofluorobenzene (BFB) for Volatiles Analysis

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	26.38	26.38	Ok
75	30-60% of mass 95	49.76	49.76	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	7.77	7.77	Ok
173	Less then 1% of mass 95	0.00	0.00	Ok
174	Greater then 50% of mass 95	87.36	87.36	Ok
175	5-9% of mass 174	6.81	7.79	Ok
176	95-101% of mass 174	85.04	97.34	Ok
177	5-9% of mass 176	6.53	7.68	Ok

Injection Date 11/07/84 Analyst: M Bockly
Injection Time 06:32 Processor: [illegible]
Run No: 85235 QC Batch: QV2455
Spectrum No. 710 Samples: F6436, F6936 - F6940, F7338, F7567, F7714, F8248, F8504

ETC ENVIRONMENTAL TESTING and CERTIFICATION

November 12, 1984

TABLE 2: METHOD PERFORMANCE DATA

GC/MS Tuning Data - Decafluorotriphenylphospine (DFTPP) for Base/Neutrals Analysis (QR23)

Chain of Custody Data Required for STO Data Management Summary Reports

F6940

ETC Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours

m/z	Ion Abundance Criteria	Abundance (% Base Peak)
51	30-60% of mass 198	49
68	Less than 2% of mass 69	<2
70	Less than 2% of mass 69	<2
127	40-60% of mass 198	42
197	Less than 1% of mass 198	<1
198	Base peak, 100% relative abundance	100
199	5-9% of mass 198	7
275	10-30% of mass 198	19
365	Greater than 1% of mass 198	2
441	Less than mass 443	11
442	Greater than 40% of mass 198	70
443	17-23% of mass 442	14

Date: 5/10/21
Run No: F4447
Spectrum No: 300
Analyst: [S]P. Chany

0021

ETC ENVIRONMENTAL TESTING and CERTIFICATION

October 24, 1984

TABLE 2: METHOD PERFORMANCE DATA

GC/MS Tuning Data – Decafluorotriphenylphospine (DFTPP) for Acids Analysis (OR22)

Chain of Custody Data Required for ETC Data Management Summary Report

F6940

Etc Sample No.	Company	Facility	Sample Point	Date	Time	Elapsed Hours

m/z	Ion Abundance Criteria	Abundance (% Base Peak)
51	30-60% of mass 198	57
68	Less than 2% of mass 69	<1
70	Less than 2% of mass 69	<1
127	40-60% of mass 198	52
197	Less than 1% of mass 198	<1
198	Base peak, 100% relative abundance	100
199	5-9% of mass 198	7
275	10-30% of mass 198	19
365	Greater than 1% of mass 198	2
441	Less than mass 443	8
442	Greater than 40% of mass 198	70
443	17-23% of mass 442	14

Date: 841017
Run No: >05092
Spectrum: 205
Analyst: T. Mancuso

0022

REFERENCE NO. 16

02-96-03-0020

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Borne Chemical file

DATE: 02/27/97

(Page 1)

FROM: K. Campbell KC

SUBJECT: Miscellaneous Data Reports

REFERENCE

Various sampling events have occurred at the Borne facility. The following presents a summary of available data reports that are not included in other references of this report:

Date	Sampling Agency/Laboratory	Sample Analyses and Comments
(Att. A) 01/07/82	Valley Forge Engineering/	(5 tank oil samples) specific gravity, flash point,
	E.W. Saybolt & Co., Inc.	viscosity, sulfur content, ash content, BTUs. Two
		Samples were noted to have flash points <180 degrees.
(Att. B) 09/80	Borne Chemical/	(5 aqueous samples [including 2 samples of standing
	Case Consulting	water in Tank Farm], and 8 oil samples [inci. duplicate])
	Laboratories, Inc.	PCB analyses. Total PCB concentration in one aqueous
		sample from Tank 34 - 413 ppb, one oil sample (plus
		duplicate) from Tank 32 - four determination average of
		48 ppm, *and* one oil sample from Tank 33 - 30 ppm.
(Att. C) 11/80	Borne Chemical/	(9 liquid tank samples) Infrared spectrometry. Four
	Case Consulting	samples - mainly aliphatic and aromatic hydrocarbons,
	Laboratories, Inc.	Three samples - mixtures of aliphatic and aromatic
		hydrocarbons w/ minor quantities of esters. One sample -
		primarily aliphatic hydrocarbons w/ relatively large
		proportions of hydroxyl and sulfonate-containing species.
		One sample - mixtures of aliphatic and aromatic
		hydrocarbons w/ a possibly aliphatic nitro compound and
		a small quantity of esters.

Ref 16

02-96-03-0020

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Borne Chemical file

DATE: 02/27/97

(Page 2)

FROM: K. Campbell KC

SUBJECT: Miscellaneous Data Reports

REFERENCE

Date	Sampling Agency/Laboratory	Sample Analyses and Comments
(Att. D) 01/12/82	Valley Forge Engineering, Inc.	(5 tank oil samples) PCBs, flash point. None
	Ecology and Environment, Inc.	of the samples contained detectable
		concentrations of PCBs. All flash points were
		> 180 degrees.
(Att. E) 01/04/84	Valley Forge Engineering, Inc.	(7 surface soil samples, 3 subsurface soil samples,
	Ecology and Environment, Inc.	and 2 tank samples) Subsurface samples collected
		at depth of 1-2 ft. PCB analyses. All soil samples
		were collected within the Tank Farm Area. No
		detectable concentrations of PCBs were found.
(Att. F) 11/84	NJDEP/	(3 drum samples) Distillation, base/neutral (BN)
	S-R Analytical, Inc.	extractable organic compounds. No BN
		compounds detected.

Ref. 16

LABORATORIES AT KENILWORTH, N.J. PHILADELPHIA, HAMMOND, IND. NEW ORLEANS, PASADENA (HOUSTON) CORPUS CHRISTI, WILMINGTON, CALIF., SEATTLE, PORTLAND, ORE., TAMPICO, MEX., CHICAGO, BOSTON AND WEST HAVEN, CONN.

INSPECTION OF SULE CARGOES, PETROLEUM AND OTHER LIQUIDS, LICENSED WEIGHERS AND SAMPLERS OF VEGETABLE OILS, WAXES AND FATS.

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LABORATORY ANALYSIS REPORT

SAMPLE DESIGNATED BY CLIENT AS Fuel Oil (Marked-Submitted) 1/12/82

FROM Tank #22 (75,000)

FOR Valley Forge Engineering (ER) 766

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Lab # 0141

Grav/@60°F API	14.5
Flash Point, PMCC	90°F
Visc/100°F SUS	82.2 sec
Sulphur Content	0.04%
Pour Point	(-10°F)
Water by Distilletion	0.3%
Water & Sediment	0.1%
Ash Content	5.188%
B.T.U.'S/Gallon	150478

E. W. SAYBOLT & CO., INC.

BY Bernard J. Bradley

MEMBERS OF A.S.P.M.—A.F.I.—S.A.E.

FORM 11 REV. 1-80

Ref. 16

Att. A, p.1

LABORATORIES AT KENILWORTH, N.J., PHILADELPHIA, HAMMOND, IND., NEW ORLEANS, PASADENA (HOUSTON), CORPUS CHRISTI, WILMINGTON, CALIF., SEATTLE, PORTLAND, ORE., TAMPICO, MEX., CHICAGO, BOSTON, AND WEST HAVEN, CONN.

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LABORATORY ANALYSIS REPORT

SAMPLE DESIGNATED BY CLIENT AS Fuel Oil (Marked-Submitted) 1/12/82

FROM Tank #29 (94,000)

FOR Valley Forge Engineering (ER) 766

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Lab #0142

Grav/@60°F API	22.0
Flash Point, PMCC	144°F
Visc/100°F SUS	91.5 sec
Sulphur Content	0.44%
Pour Point	5°F
Water by Distillation	0.2%
Water & Sediment	Trace
Ash Content	2.852%
B.T.U.'S/Gallon	146291

E. W. SAYBOLT & CO., INC.

BY Bernard J. Bradley

MEMBERS OF A.S.T.M.—A.P.I.—S.A.E.

FORM 41 REV. 1-80

Ref. 16

Att. A, p. 2

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LABORATORY ANALYSIS REPORT

SAMPLE DESIGNATED BY CLIENT AS Fuel Oil (Marked-Submitted) 1/12/82

FROM Tank #32 (11,000)

FOR Valley Forge Engineering (ER) 766

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Lab # 0143

Grav/@60°F API	25.5
Flash Point, PMCC	200+°F
Visc/100°F SUS	106.4 sec
Sulphur Content	0.51%
Pour Point	(-15°F)
Water by Distillation	0.5%
Water & Sediment	0.1%
Ash Content	0.413%
B.T.U.'S/Gallon	144383

E. W. SAYBOLT & CO., INC.

BY Bernard J. Bailey

MEMBERS OF A.S.T.M.—A.P.I.—S.A.E.

FORM 41 REV. 1-80

Ref. 16

AH.A, p.3

LABORATORIES AT KENILWORTH, N. J. PHILADELPHIA, HAMMOND, IND., NEW ORLEANS, PASADENA (HOUSTON), CORPUS CHRISTI, WILMINGTON, CALIF., SEATTLE, PORTLAND, ORE., TAMPICO, MEX., CHICAGO, BOSTON, AND WEST HAVEN, CONN.

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LABORATORY ANALYSIS REPORT

SAMPLE DESIGNATED BY CLIENT AS Fuel Oil (Marked-Submitted) 1/12/82

FROM Tank #33 (74,000)

FOR Valley Forge Engineering (ER)766

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Lab #0144

Grav/@60°F API	23.6
Flash Point, PMCC	200+°F
Visc/100°F SUS	172.4 sec
Sulphur Content	1.15%
Pour Point	(-20°F)
Water by Distillation	13.0%
Water & Sediment	13.0 (10.0% wtr)
Ash Content	Too much water to run
B.T.U.'S/Gallon	140147

E. W. SAYBOLT & CO., INC.

BY Bernard J. Bradley

FORM 41 REV. 1-80

MEMBERS OF A. S. T. M. — A. P. E. — S. A. E.

SAMPLES, IF ANY, SMALL BE RETAINED FOR A PERIOD OF 45 DAYS UNLESS A LONGER PERIOD IS REQUESTED IN WRITING.

Ref. 16

LABORATORIES AT KENILWORTH, N. J. PHILADELPHIA, HAMMOND, IND., NEW ORLEANS, PASCAGOULA, HOUSTON, CORPUS CHRISTI, WILMINGTON, CALIF., SEATTLE, PORTLAND, ORE., TAMPICO, MEX., CHICAGO, BOSTON, AND WEST HAVEN, CONN.

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LABORATORY ANALYSIS REPORT

SAMPLE DESIGNATED BY CLIENT AS Fuel Oil 1/12/82

FROM Tank #42 (22,000+)

FOR Valley Forge Engineering (ER) 766

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Lab # 0145

Grav/@60°F API	24.0
Flash Point, PMCC	200+°F
Visc/100°F SUS	132.0 sec
Sulphur Content	0.92%
Pour Point	(-10°F)
Water by Distillation	6.0%
Water & Sediment	8.0 (5.6% wtr)
Ash Content	0.608%
B.T.U.'S/Gallon	142025

E. W. SAYBOLT & CO., INC.

BY Bernard J. Dooley

MEMBERS OF A.S.T.M.—A.P.I.—S.A.E.

FORM 41 REV. 1-80

Ref. 11

Att. A, p. 5

CHAIN OF CUSTODY RECORD

New Jersey Department of Environmental Protection
Bureau of Hazardous Waste
32 East Hanover Street
Trenton, New Jersey 08625

Name of Unit and Address:

Sample Number	Number of Containers	Description of Samples
[illegible]	1	One ~~[illegible]~~ full ½ pint plastic container containing a black oily liquid.
[illegible]	1	One full pint plastic container containing a black oily liquid.
[illegible]	1	One 3/4 full quart glass container containing a black oily liquid.
[illegible]	1	One 3/4 full quart glass container containing a ~~[illegible]~~ clear liquid with black oily over floating entry.
[illegible]	1	One 3/4 full quart glass container containing a black thin liquid.
[illegible]	1	One ½ full quart glass container containing a black ~~[illegible]~~ oily liquid
		Last Item

Person Assuming Responsibility for Sample:	Time	Date
Alphonse Iannuzzi Jr.	1310	1-7-81

Sample Number	Relinquished By:	Received By:	Time	Date	Reason for Change of Custody
all above	Alphonse Iannuzzi Jr. / Alphonse Iannuzzi Jr.	Wayne Nowitz / Wayne Nowitz	1145	01/08/81	Transfer
Sample Number	Relinquished By:	Received By:	Time	Date	Reason for Change of Custody
Sample Number	Relinquished By:	Received By:	Time	Date	Reason for Change of Custody
Sample Number	Relinquished By:	Received By:	Time	Date	Reason for Change of Custody

Page No.

Ref. 16

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF HAZARDOUS WASTE

DATE 1-7-82

FIELD SAMPLING
DATA SHEET

CASE NAME Borne Chemical

LOCATION S. Front street
Elizabeth, N.J.

TIME OF SAMPLING 0945 AM ___ PM

COLLECTED BY Joe Meehan Valley Forge

RECORDED BY Al Iannuzzi (GVW)

FIELD SAMPLE NO. A AI127

B

SPECIFIC SAMPLING SITE:

___ DRUM #

___ TANK TRAILER #

X STATIONARY TANK # 32

___ TOP ___ MID ___ BOT graduated

___ OTHER

SAMPLING CONTAINER:

___ GLASS X PLASTIC

___ OTHER

CONTAINER VOLUME:

___ PINT ___ QUART 1/2 Pint

X OTHER ___ OZ./ ___ ML.

CONTAINER FILLED: X YES ___ NO

CHAIN OF CUSTODY INITIATED

X YES ___ NO

TYPE OF SAMPLE:

X LIQUID ___ SLUDGE

___ SOLID ___ SOIL

___ OTHER

CHARACTERISTICS OF SAMPLE:

X TURBID ___ TRANSPARENT

COLOR black oily liquid.

ODOR oil

OTHER

SUSPECTED SUBSTANCES(S):

PCB, chlorinated H-C.

ADDITIONAL INFORMATION:

Sample taken c̄ weighted bottle (glass) at different levels. water is not sampled; taken from top port.

Sample given to me. I did not witness sampling. Valley Forge kept split

Ref. 16

Att. A, p. 7

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF HAZARDOUS WASTE

DATE 1-7-82

FIELD SAMPLING
DATA SHEET

CASE NAME Borne chemical

LOCATION 632 S. Front St.
Elizabeth, NJ

TIME OF SAMPLING 1010 AM ___ PM

COLLECTED BY Joe Meehan, Vally Forge

RECORDED BY Al Iannuzzi, BAU

FIELD SAMPLE NO. A AI12g

B ___

SPECIFIC SAMPLING SITE:

___ DRUM # ___

X TANK TRAILER # ___

X STATIONARY TANK # 42.

___ TOP ___ MID ___ BOT graduated

___ OTHER ___

SAMPLING CONTAINER:

___ GLASS X PLASTIC

___ OTHER ___

CONTAINER VOLUME:

X PINT ___ QUART

___ OTHER ___ OZ./ ___ ML.

CONTAINER FILLED: X YES ___ NO

CHAIN OF CUSTODY INITIATED

X YES ___ NO

TYPE OF SAMPLE:

X LIQUID ___ SLUDGE

___ SOLID ___ SOIL

___ OTHER ___

CHARACTERISTICS OF SAMPLE:

X TURBID ___ TRANSPARENT

COLOR black

ODOR oily

OTHER oily liq.

SUSPECTED SUBSTANCES(S):

PCB, Cl2 H-C

ADDITIONAL INFORMATION:

sample taken with samp bottle as in NI127. from top port at different levels. Vally Forge kept split samples

Samples given to me I did not witness sampling.

Ref. 10

PAR ION

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF HAZARDOUS WASTE

DATE 1-7-81

FIELD SAMPLING DATA SHEET

CASE NAME Borne Chemical

TIME OF SAMPLING 1650 AM ___ PM

LOCATION 632 S. Front street
Elizabeth, NJ

COLLECTED BY Joe Meehan Valley Forge

RECORDED BY R. Iannuzzi, RW

FIELD SAMPLE NO. A AI129

B

SPECIFIC SAMPLING SITE:

___ DRUM #

___ TANK TRAILER #

X STATIONARY TANK # 22

___ TOP ___ MID ___ BOT graduated

___ OTHER

SAMPLING CONTAINER:

X GLASS ___ PLASTIC

___ OTHER

CONTAINER VOLUME:

___ FINT X QUART

___ OTHER ___ OZ./ ___ ML.

CONTAINER FILLED: ___ YES X NO 3/4 full

CHAIN OF CUSTODY INITIATED

X YES ___ NO

TYPE OF SAMPLE:

X LIQUID ___ SLUDGE

___ SOLID ___ SOIL

___ OTHER

CHARACTERISTICS OF SAMPLE:

X TURBID ___ TRANSPARENT

COLOR black

ODOR Solvent odor

OTHER oily liquid

SUSPECTED SUBSTANCES(S):

PCB, Cl2

ADDITIONAL INFORMATION:

tank appears 3/4 full
Sampled from top port
With same weighted bottle as
used for AI128.
Valley Forge kept split samples.
I. witnessed sampling

Ref. 16

Att. A, p. 9

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF HAZARDOUS WASTE

DATE 1-7-81

FIELD SAMPLING DATA SHEET

CASE NAME Borne Chemical

LOCATION 632 S. Front St.
Elizabeth, NJ.

TIME OF SAMPLING 1:12 AM ___ PM

COLLECTED BY Joe Meehan, Vally Forge

RECORDED BY Al Iannuzzi, RHC

FIELD SAMPLE NO. A AI130

B

SPECIFIC SAMPLING SITE:

___ DRUM #

___ TANK TRAILER #

X STATIONARY TANK # 27

___ TOP ___ MID ___ BOT graduated

___ OTHER

SAMPLING CONTAINER:

___ GLASS ___ PLASTIC

___ OTHER

CONTAINER VOLUME:

___ PINT ___ QUART

___ OTHER ___ OZ./ ___ ML.

CONTAINER FILLED: ___ YES X NO 2/9 full

CHAIN OF CUSTODY INITIATED

X YES ___ NO

TYPE OF SAMPLE:

___ LIQUID ___ SLUDGE

___ SOLID ___ SOIL

___ OTHER

CHARACTERISTICS OF SAMPLE:

___ TURBID X TRANSPARENT

COLOR Clear

ODOR solvent odor

OTHER blk. oily layer floating on top.

SUSPECTED SUBSTANCES(S):

PCB, Cl_2 HC

ADDITIONAL INFORMATION:

Sample taken from top port with weighted bottle at different levels, sample bottle used as ~~in~~ for AI130. Twittnessed sampling. Vally Forge kept split samples.

Ref. 16

FAR ON

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF HAZARDOUS WASTE

DATE 1-7-81

FIELD SAMPLING
DATA SHEET

CASE NAME Borne Chemical

LOCATION 632 S. Front St.
Elizabeth, NJ

TIME OF SAMPLING 1135 AM ___ PM

COLLECTED BY Rob Collins, Nassau tank ~~Joe Mehan, Edge~~

RECORDED BY Al Iannuzzi, BHC

FIELD SAMPLE NO. A AI 131

B ___

SPECIFIC SAMPLING SITE:

___ DRUM # ___

___ TANK TRAILER # ___

X STATIONARY TANK # 29

___ TOP ___ MID ___ BOT graduated

___ OTHER ___

SAMPLING CONTAINER:

X GLASS ___ PLASTIC

___ OTHER ___

CONTAINER VOLUME:

___ PINT X QUART

___ OTHER ___ OZ./ ___ ML.

CONTAINER FILLED: ___ YES X NO 3/4 full

CHAIN OF CUSTODY INITIATED

X YES ___ NO

TYPE OF SAMPLE:

thin X LIQUID ___ SLUDGE

___ SOLID ___ SOIL

___ OTHER ___

CHARACTERISTICS OF SAMPLE:

X TURBID ___ TRANSPARENT

COLOR black

ODOR solvent

OTHER thin liquid

SUSPECTED SUBSTANCES(S):

PCB, Cl, HC, Flash pt.

ADDITIONAL INFORMATION:

Sample taken from top port with weighted bottle at different levels. Same bottle used [illegible]. I witnessed sampling. Valley Forge obtained split samples.

Ref. 16

Att. A, p. 11

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF HAZARDOUS WASTE

DATE 1-7-82

FIELD SAMPLING DATA SHEET

CASE NAME Borne Chemical

LOCATION 631 S. Front St.
Elizabeth, NJ

TIME OF SAMPLING ___ AM 1310 PM

COLLECTED BY Joe Meehan, Valley Forge

RECORDED BY Al Iannuzzi, B/Ke

FIELD SAMPLE NO. A AI132

B

SPECIFIC SAMPLING SITE:

___ DRUM #

___ TANK TRAILER #

X STATIONARY TANK #

___ TOP ___ MID ___ BOT graduated

___ OTHER

SAMPLING CONTAINER:

X GLASS ___ PLASTIC

___ OTHER

CONTAINER VOLUME:

___ PINT X QUART

___ OTHER ___ OZ. ___ ML.

CONTAINER FILLED: ___ YES X NO 1/2 full

CHAIN OF CUSTODY INITIATED

X YES ___ NO

TYPE OF SAMPLE:

X LIQUID ___ SLUDGE

___ SOLID ___ SOIL

___ OTHER

CHARACTERISTICS OF SAMPLE:

X TOPPED ___ TRANSPARENT

COLOR black

ODOR solvent

OTHER oily liq.

SUSPECTED SUBSTANCES(S):

PCB, Cl, -

ADDITIONAL INFORMATION:

taken from top part with weighted bottle, same bottle used for sample AI-21. I witnessed sampling. Valley Forge kept split samples

Ref. 16

Att. A, p. 12

Case Consulting Laboratories, Inc.

622 ROUTE TEN
WHIPPANY, NEW JERSEY 07981
(201) 428-9666

OCTOBER 1, 1980

TO: BORNE CHEMICAL COMPANY, INC.
632 SOUTH FRONT STREET
ELIZABETH, NEW JERSEY 07207

ATTENTION: MR. A. J. CORONA, GENERAL MANAGER

FROM: ROBERT BARNES, PH.D.

PROJECT NO.: 00205 -- REVISED

SUBJECT: ANALYSIS OF 13 SAMPLES OF WATER AND OIL

PURPOSE: TO DETERMINE THE POLYCHLORINATED BIPHENYL (PCB) CONTENT OF THE SUBJECT SAMPLES.

PROCEDURE: 1. PCBS IN WATER

THE PROCEDURE FOLLOWED IS "METHOD FOR POLYCHLORINATED BIPHENYLS (PCBS) IN WATER AND WASTEWATER," IN METHODS FOR BENZIDINE, CHLORINATED ORGANIC COMPOUNDS, PENTACHLOROPHENOL AND PESTICIDES IN WATER AND WASTEWATER, U.S.E.P.A., E.M.S.L., SEPTEMBER, 1978. IN BRIEF, THE PROCEDURE INVOLVES THE FOLLOWING STEPS:

- THE SAMPLE PH IS ADJUSTED TO 6.5 TO 7.5
- THE PCBS ARE THEN EXTRACTED WITH THREE 60 ML PORTIONS OF 15 PERCENT METHYLENE CHLORIDE IN HEXANE
- THE EXTRACTS ARE DRIED WITH ANHYDROUS SODIUM SULFATE AND CONCENTRATED IN A KUDERNA DANISH EVAPORATOR
- THE PCB CONTENT OF THE CONCENTRATE IS DETERMINED BY ELECTRON CAPTURE GAS CHROMATOGRAPHY
- CONCENTRATES WERE CLEANED UP BY CHROMATOGRAPHY ON SILICA GEL, AS DESCRIBED IN THE FOLLOWING PROCEDURE FOR PCBS IN OILS AND THEN REANALYZED BY GAS CHROMATOGRAPHY

Ref. 16

PROCEDURES CONTINUED:

- THE DETECTION LIMIT OF THE PCBS DEPENDS ON THE SIZE OF THE SAMPLE EXTRACTED. THE USUAL SAMPLE VOLUME IS ONE LITER OF WATER. HOWEVER, IF THE SAMPLE CONTAINS TOO MUCH HEXANE/METHYLENE CHLORIDE SOLUBLE MATERIAL, A SMALLER SAMPLE IS TAKEN AND A HIGHER DETECTION LIMIT RESULTS.

2. PCBS IN OIL

THE PROCEDURE WAS RECOMMENDED BY U.S.E.P.A. IN EDISON, NEW JERSEY. IN BRIEF, THE PROCEDURE INVOLVES THE FOLLOWING:

- A TWO ML ALIQUOT OF OIL IS DILUTED TO 100 ML WITH HEXANE
- ANHYDROUS SODIUM SULFATE IS ADDED TO THE DILUTION TO REMOVE WATER
- A ONE ML ALIQUOT OF THE DILUTION IS TRANSFERRED TO A CHROMATOGRAPHIC COLUMN CONTAINING ONE GRAM OF FULLY ACTIVATED SILICA GEL FOR CLEANUP
- THE PCBS ARE ELUTED FROM THE COLUMN WITH 20 ML OF HEXANE
- THE ELUATE IS CONCENTRATED IN A KUDERNA DANISH EVAPORATOR
- THE PCB CONTENT IS DETERMINED BY ELECTRON CAPTURE GAS CHROMATOGRAPHY.

3. CHROMATOGRAPHIC CONDITIONS

- INSTRUMENT -- PERKIN-ELMER 900B GAS CHROMATOGRAPH EQUIPPED WITH A NICKEL-63 ELECTRON CAPTURE DETECTOR
- COLUMN -- SIX FEET BY 1/4 INCH O.D. (FOUR MM I.D.) GLASS PACKED WITH 1.5 PERCENT SP-2250/ 1.95 PERCENT SP-2401 ON SUPELCOPORT 100/120
- CARRIER -- FIVE PERCENT METHANE/95 PERCENT ARGON AT 60 ML/MINUTE

PROCEDURES CONTINUED:

- TEMPERATURES -- COLUMN: 200°C, INJECTOR: 240°C, MANIFOLD: 240°C, DETECTOR: 250°C
- RANGE -- X1
- ATTENUATION -- X128, OR AS REQUIRED
- DETECTOR -- PULSED
- INJECTION VOLUME -- ONE TO SIX MICROLITERS
- CHART SPEED -- ONE MINUTE PER CENTIMETER.

RESULTS:

RESULTS FOR THE WATER SAMPLES ARE GIVEN IN UNITS OF PARTS PER BILLION (PPB) IN EXHIBIT I, ATTACHED. TK34 TOP WAS THE ONLY SAMPLE FOUND TO CONTAIN PCBS AND CONTAINED A TOTAL OF 413 PPB SPREAD OVER THE TYPES A-1260, A-1254 AND A-1248.

RESULTS FOR THE OIL SAMPLES ARE GIVEN IN UNITS OF PARTS PER MILLION (PPM) IN EXHIBIT II, ATTACHED. THE HIGHEST LEVEL OF PCBS WAS OBTAINED IN TK32 WHICH WAS SUBMITTED IN DUPLICATE. EACH SAMPLE WAS ANALYZED IN DUPLICATE TO GIVE THE FOLLOWING VALUES:

- TK32: 54,47
- TK32: FIELD SAMPLED 9-19-80: 44,47

THE AVERAGE OF THE FOUR DETERMINATIONS IS 48 PPM.

RESPECTFULLY SUBMITTED,

Robert Barnes

ROBERT BARNES, PH.D.
MANAGER, CHEMICAL AND
ANALYTICAL SERVICES

CASE CONSULTING LABORATORIES, INC.

ATTACHMENTS

RB

Ref. 16

Att. B, p. 3

Ref 6

Att. B, p. 4

EXHIBIT I
BORNE CHEMICAL COMPANY, INC.
RESULTS OF WATER ANALYSES

C.C.L. CONTROL NUMBER	BORNE IDENTIFICATION	TYPE OF PCB PRESENT	LEVEL (PPB)
80-1294	DIKE, GROUND WATER BETWEEN TK42 AND TK32	-	< 2*
80-1295	DIKE, GROUND WATER BEHIND TK36	-	< 2*
80-1301	TK23	-	< 1*
80-1302	TK34 TOP	A-1260 A-1254 A-1248	95 28 290 } 413 TOTAL
80-1305	TK27 TOP	-	< 1*

* NOT FOUND, LESS THAN NUMBER SHOWN WHICH IS THE DETECTION LIMIT.

SOURCE: CASE CONSULTING LABORATORIES, INC.

Ref. 16

Att. B, p. 5

EXHIBIT II
BORNE CHEMICAL COMPANY, INC.
RESULTS OF OIL ANALYSES

C.C.L. CONTROL NUMBER	BORNE IDENTIFICATION	TYPE OF PCB PRESENT	LEVEL (PPM)	
80-1296	TK24 TOP	-	< 10*	
80-1297	TK27 TOP	-	< 10*	
80-1298**	TK32	A-1254	54,47	
80-1325**	TK32, FIELD SAMPLED 9-19-80	A-1254	44,47	
80-1299	TK22	-	< 10*	
80-1300	TK29	A-1254	14	
80-1303	TK42 TOP	A-1260	29	
80-1304	TK33 TOP	A-1260 A-1254	12 18	30 TOTAL

* NOT FOUND, LESS THAN NUMBER SHOWN WHICH IS THE DETECTION LIMIT.

** ANALYSES ON THESE SAMPLES WERE CONDUCTED IN DUPLICATE.

SOURCE: CASE CONSULTING LABORATORIES, INC.

Case Consulting Laboratories, Inc.

622 ROUTE TEN
WHIPPANY, NEW JERSEY 07981
(201) 428-9666

NOVEMBER 13, 1980

TO: BORNE CHEMICAL COMPANY, INC.
632 SOUTH FRONT STREET
ELIZABETH, NEW JERSEY 07207

ATTENTION: MR. H. BRUNNWASER, VICE PRESIDENT

FROM: PATRICIA T. MCGARRY

PROJECT NO.: 00283

SUBJECT: CASE CONSULTING LABS.

CONTROL NUMBER	CLIENT IDENTIFICATION
80-1296	TK24 TOP
80-1297	TK27 TOP
80-1298	TK32
80-1299	TK22
80-1300	TK29
80-1303	TK42 TOP
80-1304	TK33 TOP
80-1386	26
80-1387	31

PURPOSE: CHARACTERIZATION OF THE SUBMITTED SAMPLES BY INFRARED ANALYSIS.

PROCEDURE: A THIN FILM OF EACH SUBMITTED SAMPLE WAS PLACED BETWEEN SODIUM CHLORIDE PLATES AND SCANNED FROM 4000 TO 200 CM^{-1} WITH A RECORDING INFRARED SPECTROPHOTOMETER. THE SPECTRA WERE THEN EXAMINED FOR ABSORPTION BANDS CHARACTERISTIC OF ORGANIC FUNCTIONAL GROUPS.

RESULTS: OUR RESULTS ARE SHOWN IN EXHIBIT I, ATTACHED.

CONCLUSIONS: BECAUSE ALL OF THE SUBMITTED SAMPLES APPEAR TO BE MIXTURES, RATHER THAN PURE, SINGLE COMPOUNDS, FUNCTIONAL GROUP BAND OVERLAPPING PRECLUDES POSITIVE IDENTIFICATION OF ESTERS, SULFONATES, NITRO COMPOUNDS AND INDIVIDUAL AROMATIC ISOMERS. HOWEVER, THE FOLLOWING GENERAL OBSERVATIONS MAY BE MADE FROM THE SPECTRA:

Att. C, p.1

Ref. 16

CONCLUSIONS CONTINUED:

- SAMPLES 80-1297, 80-1298, 80-1304 AND 80-1387 APPEAR TO BE COMPRISED MAINLY OF ALIPHATIC AND AROMATIC HYDROCARBONS.
- SAMPLES 80-1299, 80-1303 AND 80-1386 APPEAR TO BE MIXTURES OF ALIPHATIC AND AROMATIC HYDROCARBONS WITH MINOR QUANTITIES OF ESTERS.
- SAMPLE 80-1296 APPEARS TO BE PRIMARILY ALIPHATIC HYDROCARBON(S) WITH RELATIVELY LARGE PROPORTIONS OF HYDROXYL AND SULFONATE-CONTAINING SPECIES.
- SAMPLE 80-1300 APPEARS TO BE MIXTURES OF ALIPHATIC AND AROMATIC HYDROCARBONS WITH A POSSIBLY ALIPHATIC NITRO COMPOUND AND A SMALL QUANTITY OF ESTER(S).
- IN ALL CASES, MORE DEFINITIVE IDENTIFICATION OF THE SAMPLE COMPOSITION WOULD REQUIRE SEPARATION AND IDENTIFICATION OF THE INDIVIDUAL CONSTITUENTS.

COPIES OF THE INFRARED SPECTRA ARE ENCLOSED.

RESPECTFULLY SUBMITTED,

Patricia T. McGarry

CASE CONSULTING LABORATORIES, INC.

PATRICIA T. MCGARRY
RESEARCH DIRECTOR

C Cuttenny for

ROBERT BARNES, PH.D.
MANAGER, CHEMICAL AND
ANALYTICAL SERVICES

RB

Ref: 16

Att. C, p.2

EXHIBIT I(1)
BORNE CHEMICAL COMPANY, INC.
TEST RESULTS

CASE CONSULTING LABS. CONTROL NUMBER	BAND LOCATION, CM^{-1}	FUNCTIONAL GROUP
80-1296	3700, 3100, 1645	OH
	2930, 2850, 1465	CH_2
	2960, 2870, 1375	CH_3
	1200, 1065	SUGGESTS S=O SULFONATE
80-1297	2920, 2850, 1465	CH_2
	2950, 2860, 1375	CH_3
	1600, 1510	C=C AROMATIC
	700-900	MIXED AROMATIC ISOMERS
80-1298	2920, 2860, 1460	CH_2
	2950, 2870, 1375	CH_3
	1600, 1515	C=C AROMATIC
	700-900	MIXED AROMATIC ISOMERS
80-1299	3400	OH
	2930, 2860, 1460	CH_2
	2950, 2870, 1375	CH_3
	1745, 1720	C=O ESTER
	1610, 1590, 1515	C=C AROMATIC
	1265, 1235, 1180, 1170, 1035	C-O-C ESTER
	690-910	MIXED AROMATIC ISOMERS
80-1300	2920, 2850, 1460	CH_2
	2950, 2865, 1375	CH_3
	1735	C=O ESTER
	1605, 1595, 1510	C=C AROMATIC
	1530, 1350	SUGGESTS NO_2 ALIPHATIC
	680-900	MIXED AROMATIC ISOMERS
80-1303	2920, 2850, 1465	CH_2
	2950, 2860, 1375	CH_3
	1735	C=O ESTER
	1600, 1510	C=C AROMATIC
	700-900	MIXED AROMATIC ISOMERS

Ref. 16

EXHIBIT I(2)
BORNE CHEMICAL COMPANY, INC.
TEST RESULTS

CASE CONSULTING LABS. CONTROL NUMBER	BAND LOCATION, CM^{-1}	FUNCTIONAL GROUP
80-1304	2920, 2850, 1460	CH_2
	2950, 2870, 1375	CH_3
	1600, 1510	C=C AROMATIC
	700-900	MIXED AROMATIC ISOMERS
80-1386	2920, 2850, 1465	CH_2
	2950, 2870, 1375	CH_3
	1730, 1740	C=O ESTER
	1600, 1510	C=C AROMATIC
	1260, 1120, 1070	C-O-C ESTER
	700-900	MIXED AROMATIC ISOMERS
80-1387	2920, 2850, 1465	CH_2
	2950, 2870, 1375	CH_3
	1610, 1590, 1510	C=C AROMATIC
	700-900	MIXED AROMATIC ISOMERS

SOURCE: CASE CONSULTING LABORATORIES, INC.

Ref. 16

ecology and environ nent, inc.
ANALYTICAL SERVICES CENTER, P.O. BOX D, BUFFALO, NEW YORK 14225, TEL. 716-631-0360
International Specialists in the Environmental Sciences

January 29, 1982

Mr. Ernest Roth
Valley Forge Engineering, Inc.
339 Radnor-Chester Rd.
Villanova, PA 19085

Dear Mr. Roth:

Enclosed are laboratory reports on the analyses of five oil samples received at our laboratory on January 16, 1982.

If you have any questions, please feel free to call me at 716-631-0360.

Very truly yours,

Gary Hahn

Gary Hahn, Manager
Analytical Services Center

GH:gb

Enclosures

Att. D, p.1

Ref. 16

recycled paper

ecology and environment, inc.
International Specialists in the Environmental Sciences

LABORATORY REPORT
FOR
VALLEY FORGE ENGINEERING

OBJECT: Determine if submitted samples contain Polychlorinated Biphenyls (PCB). Determine the flash point of submitted samples.

PROCEDURE: PCB - The sample was dissolved in Hexane. If necessary, acidified and cleaned with concentrated Sulfuric Acid, passed through a Florisil Column, and compared to a standard mixture of Aroclors on an Electron Capture-Gas Chromatograph.

Flasn Point - ASTM D 1510

Sample Date: 1/13/82 Date Received: 1/18/82

Sample Type: Oil

Customer Sample Number	Tank 22	29	32	33	42
E & E Lab Number 82-	72	73	74	75	76
Aroclor 1221, ppm	<2.5	<2.5	<2.5	<2.5	<2.5
Aroclor 1242, ppm	<2.5	<2.5	<2.5	<2.5	<2.5
Aroclor 1232, ppm	<7.5	<7.5	<7.5	<7.5	<7.5
Aroclor 1248, ppm	<2.5	<2.5	<2.5	<2.5	<2.5
Aroclor 1254, ppm	<7.5	<7.5	<7.5	<7.5	<7.5
Aroclor 1260, ppm	<2.5	<2.5	<2.5	<2.5	<2.5
Aroclor 1016, ppm	<5.0	<5.0	<5.0	<5.0	<5.0
Total PCB	<30	<30	<30	<30	<30
Flash Point, °F	>200	>200	>200	>200	>200

Supervising Analyst G. Hahn

Date January 29, 1982

GH:gb

AH. D, p.2

ecology and environment, inc.
International Specialists in the Environmental Sciences

LABORATORY REPORT

FOR

VALLEY FORGE ENGINEERING, INC.

Job No. VF-422-3 P. O. No. 113

Sample Date: 1/13/82 Sampled By: Client

Date Received: 1/16/82 Delivered By: U. S. Mail

Sample Type: Oil

E & E Lab Number 82-	72	73	74	75	76
Customer Number	22	29	32	33	42
% Chlorine	0.76	0.65	0.07	0.21	0.52

Analytical REferences - ASTM D 808

0.42 avg

Supervising Analyst D. Hahn

Date 1-29-82

Att. D, p.3

Ref. 16

recycled paper

036129

CHROMATOGRAPHIC CONOITIONS

OPERATOR L. Franzek

OATE 2/12/82

JOB NUMBER VF-422

SAMPLE IDENTIFICATION Oil Samples

SOLVENT 6% Ether/Hexane

ANALYTICAL METHOD U.S.EPA,Cincinnati,Ohio-6/24/80 "The Analysis of Polychlorinated Biphenyls in Transformer Fluid and Waste Oil"

COLUMN

Type Glass

Length 6'

Diameter 1/4" OD, 4 mm ID

Liquid Phase (% wt.) 4% SE-30/6% QF-1

Support Supelcoport

Mesh 100/120

CARRIER GAS Nitrogen

Rotameter 60

Inlet Pressure, psig 26

Flow Rate, mL/min. 30

SCAVENGER GAS

SPLIT

FID GAS

Hydrogen, mL/min.

Air, mL/min.

CHART SPEED, cm/min. 1.0

DETECTOR ECD

Range 10^{-12}

Attenuation 8

TEMPERATURE, °C

Detector 300

Injection Port 260

Column

Initial 200

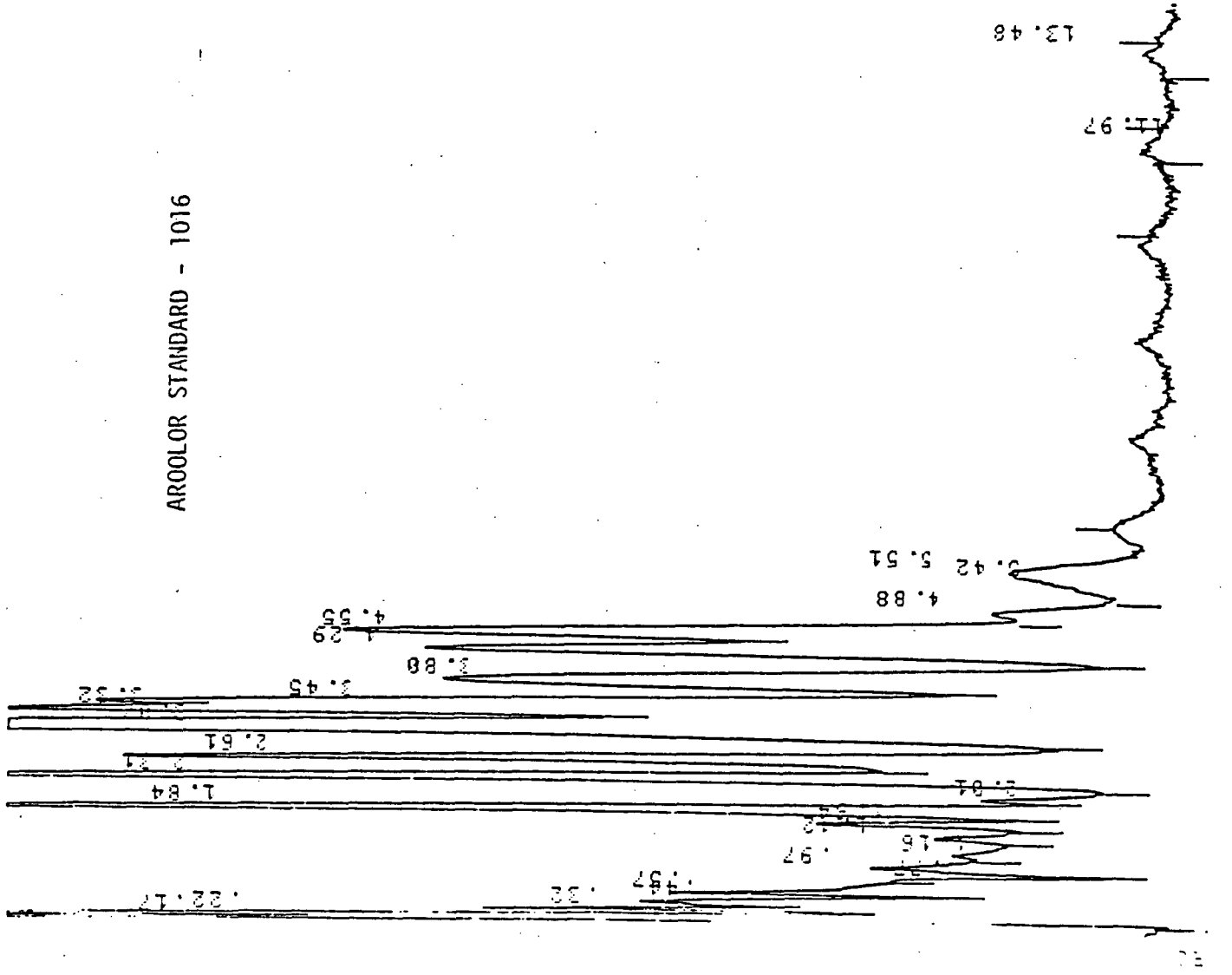
Program

Final

INSTRUMENT Varian 3700 GC

Ref. 16

Att. D, p.4



AROOLOR STANDARD - 1016

Ref. 16

Att. D, p. 5

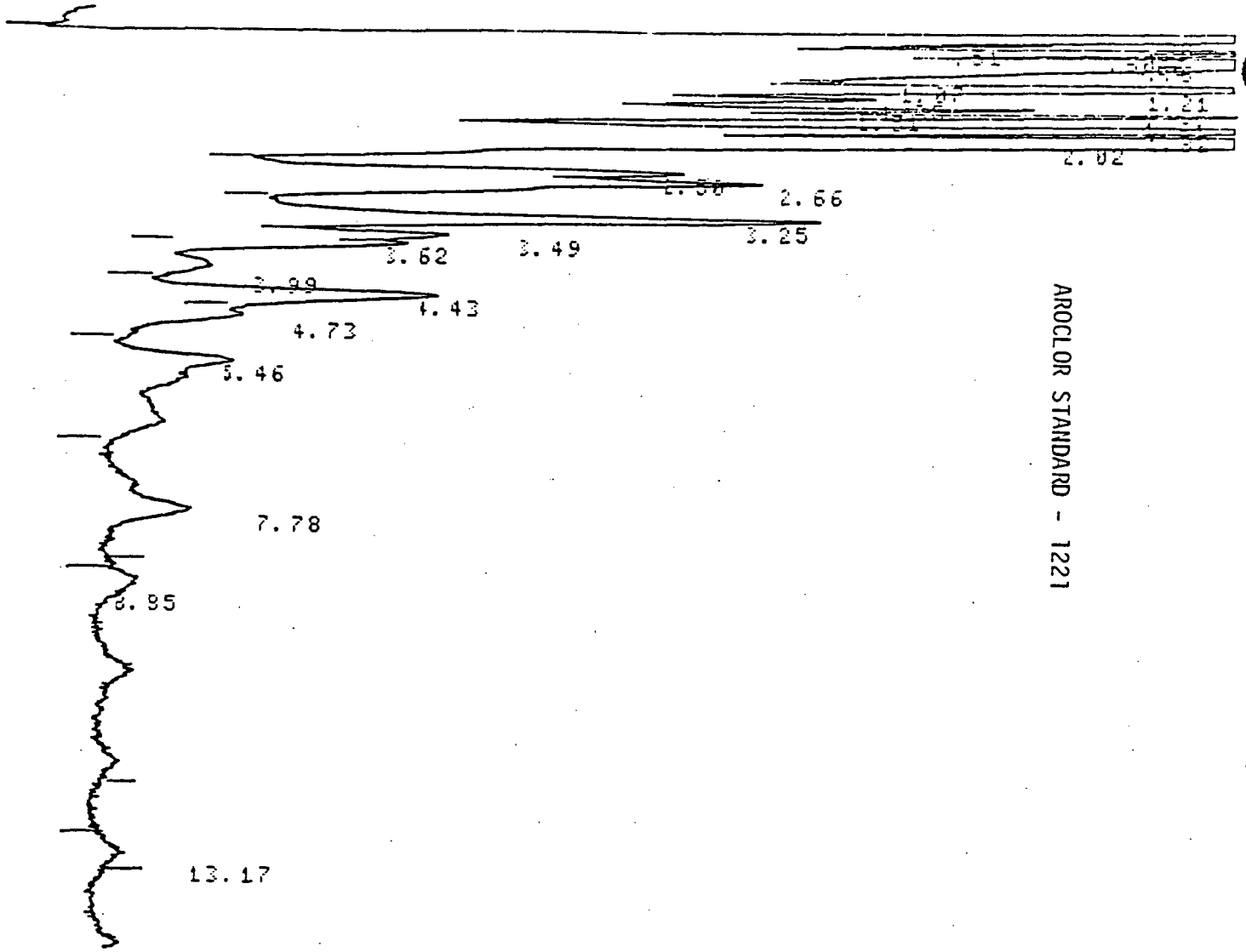
06:45:38

FILE 1 METHOD 0. RUN 14 INDEX 14

PEAK#	AREA%	RT	AREA	DC
1	11.504	0.17	237008	02
2	5.585	0.22	115075	02
3	1.645	8.32	33895	02
4	2.453	0.44	50539	02
5	2.922	0.57	60208	02
6	0.645	0.77	13281	02
7	1.872	8.97	38578	02
8	1.675	1.16	34507	02
9	1.288	1.42	26545	02
10	1.386	1.64	28550	82
11	5.568	1.84	114722	82
12	D.757	2.81	15600	82
13	6.41	2.31	132055	02
14	5.937	2.61	122319	02
15	17.544	3.87	361466	02
16	6.331	3.32	130444	02
17	5.351	3.45	110247	02
18	6.876	3.8	141663	02
19	5.351	4.29	110239	02
20	6.431	4.55	132487	02
21	1.807	4.88	20739	82
22	0.484	5.42	9982	02
23	0.745	5.51	15342	03
24	8.133	11.97	2748	01
25	8.099	13.48	2049	81
TOTAL	100.		2860288	

Ref. 16

INJECT TIME 02:43:42



AROCLOR STANDARD - 1221

02:43:42

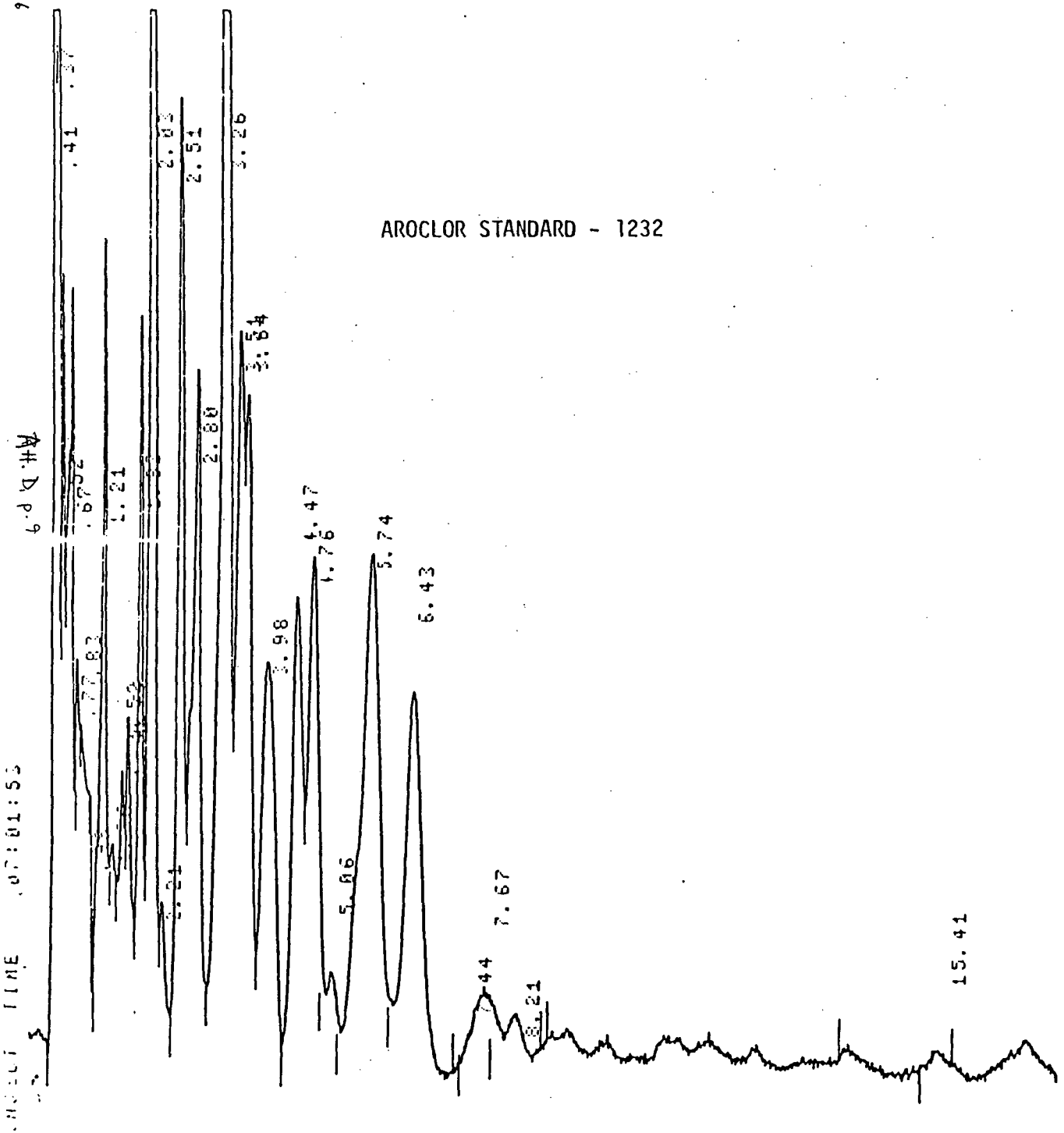
FILE 1 HETHOD 0. RUH 5 INDEX 5

PEAK#	AREA%	AT	AREA	BC
1	32.777	0.38	1296531	02
2	8.999	0.51	39520	02
3	1.662	0.6	65744	02
4	1.69	0.66	66844	02
5	12.282	0.76	485844	88
6	0.884	1.07	170	06
7	5.65	1.21	223497	02
8	1.978	1.35	78251	02
9	1.818	1.51	71922	02
10	2.831	1.61	111999	02
11	5.823	1.82	198674	82
12	21.742	2.02	860830	08
13	1.212	2.5	47924	86
14	1.967	2.66	77820	06
15	2.204	3.25	87176	86
16	0.784	3.49	30995	06
17	0.52	3.62	20560	06
18	8.21	3.99	8321	86
19	1.383	4.43	54693	86
20	0.467	4.73	18488	06
21	1.685	5.46	66656	06
22	0.821	7.78	32484	07
23	0.219	8.85	8649	01
24	8.071	13.17	2810	81
TOTAL	100.		3955602	

Ref. 16

AH.D, p.8

AROCLOR STANDARD - 1232



07:01:53

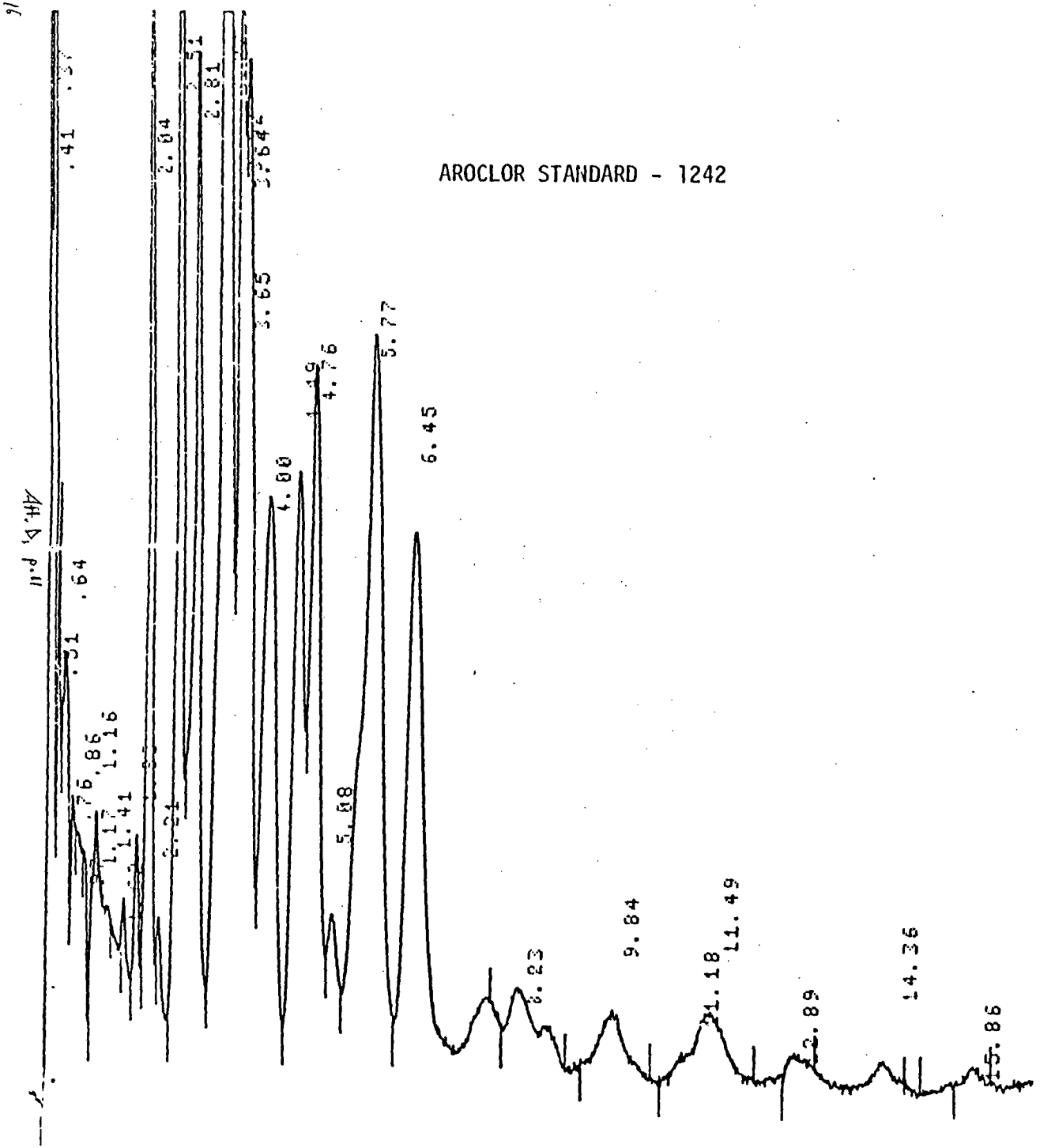
FILE 1 METHOD 0. RUN 15 INDEX 15

PEAK#	AREA%	RT	AREA	0C
1	9.539	8.37	220897	02
2	11.651	0.41	269812	02
3	1.657	8.52	38380	02
4	3.877	8.67	71263	02
5	1.174	8.77	27180	02
6	1.561	0.83	36143	02
7	0.494	0.98	11437	02
8	3.146	1.21	72852	02
9	0.886	1.36	20524	02
10	1.86	1.52	24556	02
11	0.557	1.61	12904	02
12	0.859	1.62	19902	02
13	2.5	1.83	57899	02
14	8.587	2.83	198865	02
15	8.69	2.21	15985	02
16	4.162	2.51	96382	02
17	4.591	2.8	106315	02
18	11.165	3.26	258563	02
19	3.878	3.51	89799	02
20	3.411	3.64	78994	02
21	3.813	3.98	88297	02
22	3.511	4.47	81301	02
23	4.135	4.76	95765	02
24	0.63	5.06	14581	02
25	7.397	5.74	171304	02
26	4.568	6.43	105792	03
27	0.061	7.44	1419	02
28	0.983	7.67	20906	02
29	0.229	8.21	5300	03
30	0.106	15.41	2462	01
TOTAL	100.		2315779	

Att. D, p.10

Ref. 16

AROCLOR STANDARD - 1242

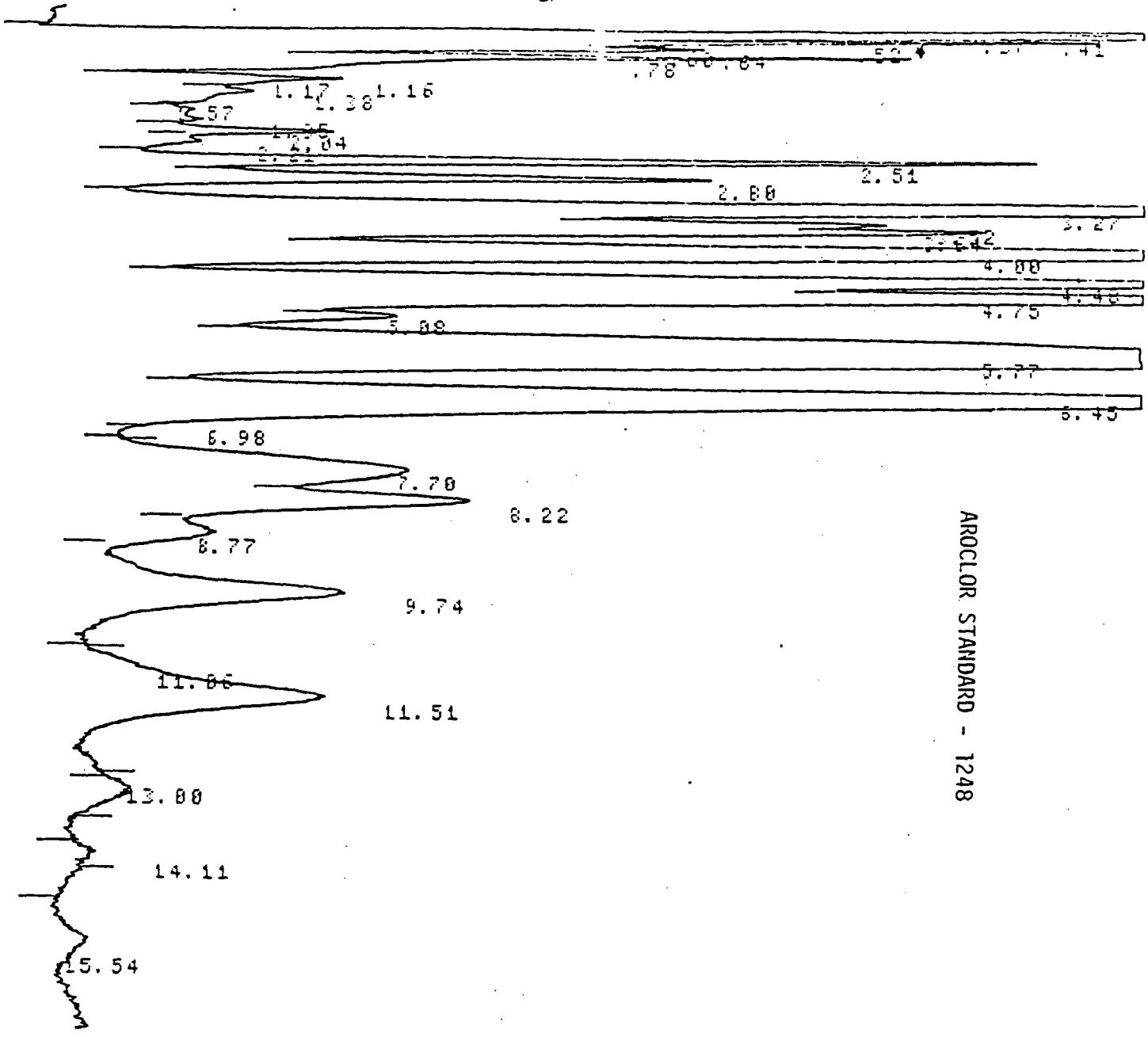


07:20:43

FILE 1 METHOD 0. RUN 16 INDEX 16

PEAK#	AREA%	RT	AREA	BC
1	8.87	0.37	196836	02
2	6.787	0.41	165549	02
3	1.315	0.51	32079	02
4	1.984	0.64	48383	82
5	1.128	0.76	27513	02
6	0.982	0.86	23958	02
7	0.564	0.97	13754	82
8	0.816	1.16	19897	82
9	1.645	1.17	40121	02
10	0.862	1.41	21026	02
11	8.847	1.62	20668	02
12	0.974	1.83	23761	02
13	4.469	2.04	108998	82
14	0.749	2.21	18262	82
15	5.929	2.51	144625	82
16	5.721	2.81	139539	02
17	14.996	3.27	365772	02
18	5.458	3.52	133134	82
19	1.782	3.64	43467	82
20	3.135	3.65	76473	02
21	5.192	4.	126638	02
22	4.847	4.49	98715	02
23	4.902	4.76	119576	02
24	0.861	5.08	21003	02
25	8.942	5.77	218100	02
26	4.323	6.45	105442	03
27	0.838	8.23	20432	81
28	0.766	9.84	18682	81
29	0.228	11.18	5568	02
30	1.135	11.49	27681	83
31	8.219	12.89	5350	01
32	0.231	14.36	5640	01
33	8.104	15.86	2526	01
TOTAL	100.		2439160	

INJECT TIME 07:39:03



AROCLOR STANDARD - 1248

Table 3-1

CHROMATOGRAPHIC CONDITIONS FOR POLYCHLORINATED BIPHENYLS

Operator: L. Franek
Date: January 23, 1984
Job Number: VF-279
Sample Identification: 84-20-91
Solvent: Hexane
Analytical Method: SW-8A6
Instrument: Varian 370C GC

COLUMN

Type: Glass
Length: 6'
Diameter: 1/4"
Liquid Phase (% wt.): 4% SE-30, 6% OV-1
Support: Supelcoport
Mesh: 100/120

CARRIER GAS: Nitrogen
Rotameter: 25
Inlet Pressure, psig: 60
Flow Rate, mL/min.: 30

SCAVENGER GAS:

SPLIT:

HALL DETECTOR

Mode:
Solvent:
Solvent flow, mL/min.:
Reactor tube temperature, °C:
Reactor gas:
Reactor gas flow, mL/min.:

FID GAS

Hydrogen, mL/min.:
Air, mL/min.:

CHART SPEED, cm/min.: 0.5

DETECTOR: Electron capture
Range: 10^{-12}
Attenuation: 256

TEMPERATURE, °C

Detector: 330
Injection Port: 220
Column
Initial: 200
Program:
Final:

PURGE AND TRAP

Purge time: Temp.:
Purge flow:
Desorb time: Temp.:
Bake time: Temp.:

23RC82

Att. E, p. 11

Ref. 16

4. RESULTS

The analytical results are presented in Table 4-1. The chromatograms were compared with those of Aroclors 1221, 1260, 1248, 1242, 1232, 1016, and 1254. None of these PCB compounds were identified in any of the soil samples or in the oil sample taken from tank 42.

The oil sample from tank 22 contained a pattern similar to that of Aroclor 1254. Further analysis of the tank 22 sample by gas chromatograph/mass spectrometry (GC/MS), however, failed to confirm the presence of Aroclor 1254. The sample was examined for the ions specific to Aroclor 1254, but they were not found to be in the correct pattern or the correct retention times. The GC/MS operating conditions are presented in Figure 4-2.

In summary, no detectable quantities of PCBs were found in any of the samples taken from the Sorne Chemical Company site in Elizabeth, New Jersey.

Ref. 10

Att. E, p. 12

ecology and environment, inc.
International Specialists in the Environmental Sciences

LABORATORY REPORT

FOR

VALLEY FORGE ENGINEERING

Job No.: VF-279

Sample Date: 1/4/84 Sampled By: Ecology and Environment, Inc.

Date Received: 1/5/84 Delivered By: Ecology and Environment, Inc.

E & E Lab Number 84-	26	27	28	29	30	31
Sample Identity	CS3-0-6	CS3-36	CS4-0-6	CS5-0-6	Tank 22	Tank 42
Aroclor 1254, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0
Aroclor 1232, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0
Aroclor 1016, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0
Aroclor 1221, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 2.5	< 2.5
Aroclor 1248, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 2.5	< 2.5
Aroclor 1242, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 2.5	< 2.5
Aroclor 1260, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 2.5	< 2.5

Supervising Analyst M. Hain

Date: 1-25-84

Table 4-1
ANALYTICAL RESULTS (Cont.)

Ref. 16

* Att. E, p.14

Table 4-2

CC/MS OPERATING CONDITIONS

Operator C. Wojtowicz

Date January 23, 1984

Job Number YF-279

Sample Identification Se-30

Solvent Hexane

Analytical Method EPA 625

Instrument HP59938 CC/MS

EPA 600/4-82-057

COLUMN

Type Glass

Length 6'

Diameter 2mm ID

Liquid Phase (% wt.) 3% SP 2250

Support Supelcoport

Mesh 100/120

CARRIER GAS Helium

Rotameter 60

Inlet Pressure, psig 15

Flow Rate, mL/min. 30

SCAVENGER GAS

SPIKE

HALL DETECTOR

Mode

Solvent

Solvent Flow, mL/min.

Reactor tube temperature, °C

Reactor gas

Reactor gas flow, mL/min.

FID GAS

Hydrogen, mL/min.

Air, mL/min.

CHART SPEED, cm/min.

DETECTOR Mass Spectrometer

Range 50-500 a.e.u.

Attenuation

TEMPERATURE, °C

Detector

Injection Port 225°

Column

Initial 75°/5 min

Program 10°/min

Final 275

PURGE AND TRAP

Purge time Temp.

Purge flow

Desorb time Temp.

Bake time Temp.

238082

Ref. 11

Att. E, p. 15

07:39:03

FILE 1 METHOD 0. RUN 17 INDEX 17

PEAK#	RREA%	RT	AREA	BC
1	8.853	8.37	385942	02
2	6.702	0.41	292202	02
3	1.322	0.52	57624	02
4	0.349	0.6	15200	02
5	1.174	0.64	51161	02
6	2.398	0.78	104552	02
7	0.42	1.16	18293	82
8	0.497	1.17	21665	02
9	0.878	1.38	38290	02
10	0.125	1.57	5441	02
11	0.704	1.85	30675	02
12	0.771	2.04	33603	02
13	0.464	2.21	20217	82
14	2.205	2.51	96120	02
15	1.983	2.8	86445	82
16	8.848	3.27	385732	02
17	1.972	3.52	85977	02
18	2.743	3.64	119680	02
19	7.418	4.	323407	92
20	5.27	4.48	229732	82
21	6.683	4.75	287847	02
22	1.22	5.08	53176	02
23	15.944	5.77	695100	02
24	10.062	6.45	438649	02
25	0.022	6.98	966	03
26	2.789	7.7	121571	02
27	2.437	8.22	106222	02
28	0.718	8.77	31285	02
29	2.173	9.74	94754	03
30	0.167	11.06	7285	02
31	2.148	11.51	93643	83
32	0.193	13.	8419	01
33	0.044	14.11	1926	01
34	8.387	15.54	16890	21
TOTAL	100.		4359611	

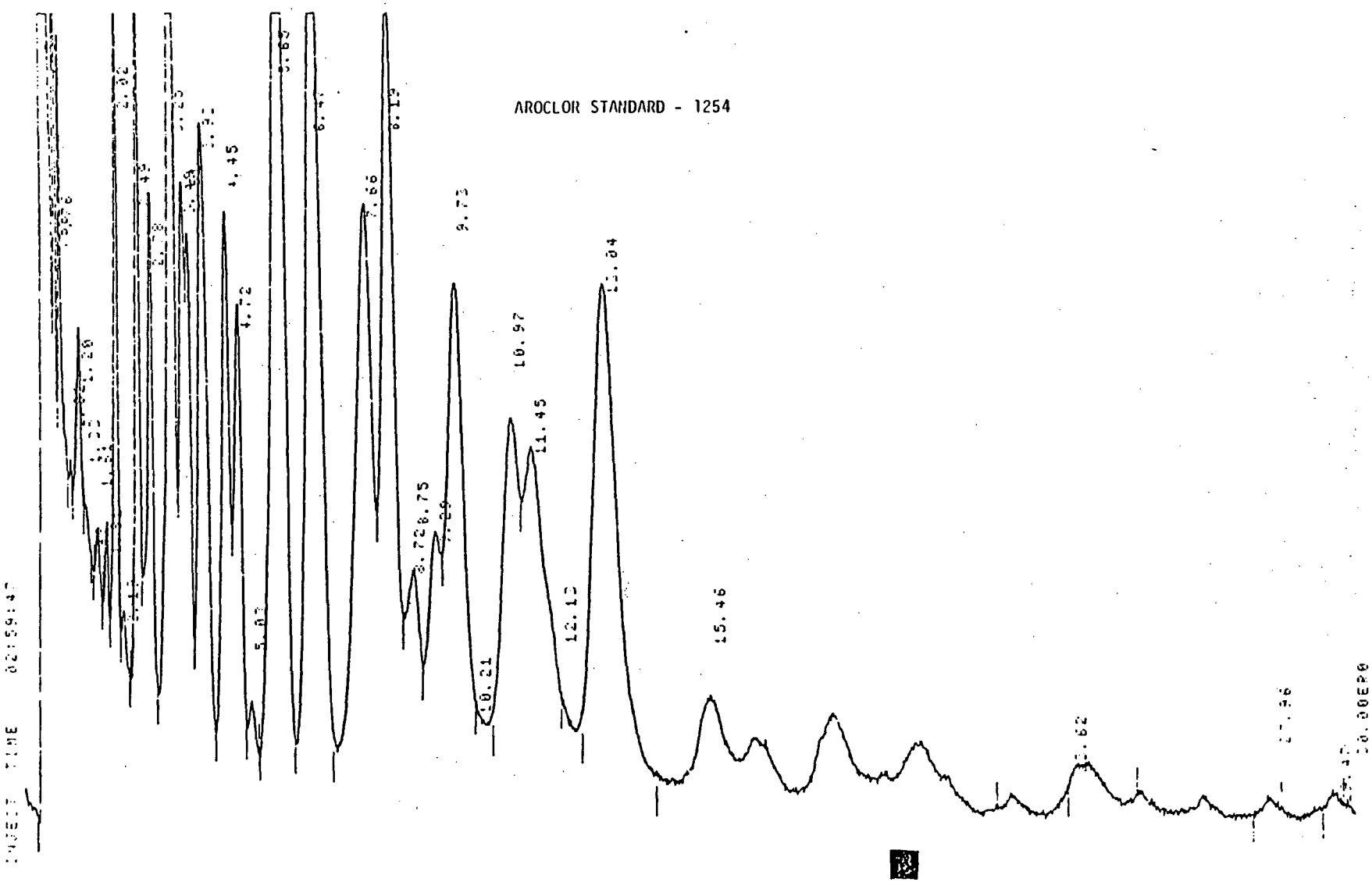
Ref. 16

Att. D, p.14

Ref. 16

Att. D, p. 15

AROCLOR STANDARD - 1254



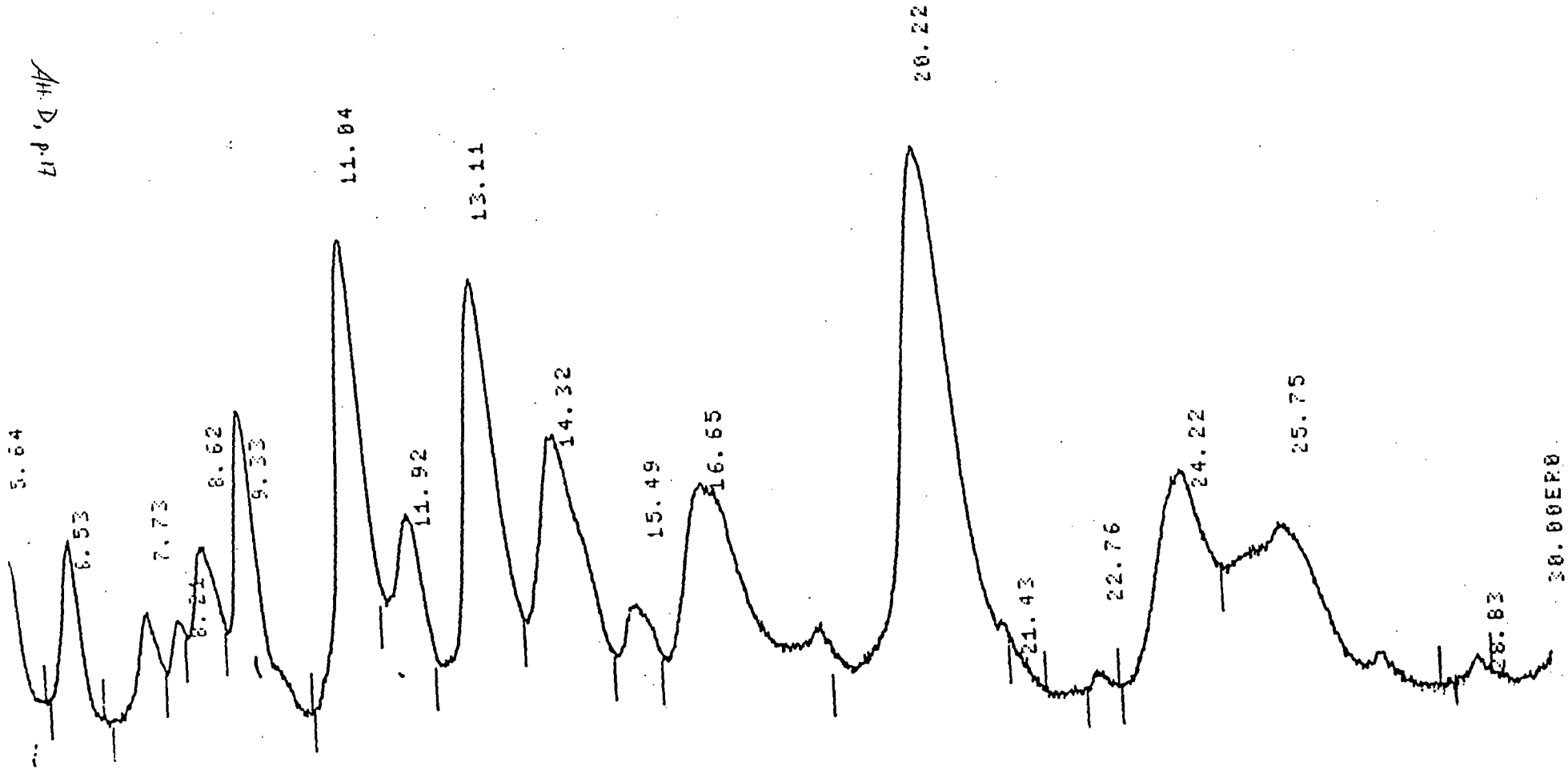
02:59:47

FILE 1 METHOD 0. RUN 6 INDEX 6

PEAK#	AREA%	RT	AREA	BC
1	62.603	0.43	6679971	08
2	0.583	0.66	62247	05
3	0.211	8.76	22462	05
4	0.011	1.02	1217	06
5	0.229	1.2	24467	86
6	0.035	1.33	3747	06
7	0.001	1.48	70	07
8	0.047	1.61	5017	81
9	0.862	1.81	6573	82
10	0.634	2.02	67629	02
11	0.842	2.19	4480	83
12	0.841	2.49	89717	82
13	0.739	2.78	78839	82
14	2.273	3.25	242511	82
15	0.79	3.49	84318	82
16	0.667	3.61	71147	82
17	1.419	3.93	151429	82
18	1.045	4.45	111499	02
19	0.909	4.72	97038	82
20	0.071	5.03	7556	03
21	3.619	5.65	386202	02
22	3.562	6.47	380068	02
23	2.6	7.66	277432	82
24	2.943	8.19	314036	82
25	0.238	8.72	25425	02
26	8.476	8.75	50771	02
27	0.844	9.29	98014	02
28	2.262	9.73	241396	02
29	0.205	10.21	21914	02
30	1.729	10.97	184502	82
31	2.042	11.45	217876	82
32	0.278	12.13	29644	82
33	3.352	13.04	357662	08
34	2.481	15.46	264780	05
35	0.097	23.62	10391	81
36	0.031	27.96	3268	81
37	0.028	29.47	3015	01
TOTAL	100.		10670330	

Ref. 16

AROCLOR STANDARD - 1260



Att. D, p.17

FILE 1 METHOD 0. RUN 18 INDEX 10

PEAK#	AREA%	RT	AREA	BC
1	6.597	0.37	218848	02
2	5.186	0.42	172025	02
3	1.138	0.52	37765	02
4	1.319	0.64	43771	02
5	21.11	0.78	700278	08
6	0.527	1.16	17476	06
7	0.617	1.4	20470	06
8	0.179	1.56	5953	06
9	0.613	1.69	20336	06
10	0.194	1.85	6437	06
11	0.596	2.03	19784	06
12	0.189	2.33	3627	06
13	0.237	2.69	7874	06
14	0.481	3.29	15953	06
15	1.295	5.64	42970	07
16	1.186	6.53	39358	01
17	0.949	7.73	31482	02
18	0.646	8.21	21423	02
19	1.882	8.62	62446	02
20	3.136	9.33	104831	03
21	5.777	11.04	191629	02
22	2.591	11.92	85955	02
23	6.618	13.11	219532	02
24	5.351	14.32	177587	02
25	1.28	15.49	42455	02
26	6.611	16.65	219382	02
27	12.766	20.22	423494	02
28	0.26	21.43	8648	03
29	8.082	22.76	2710	01
30	4.967	24.22	164767	02
31	5.689	25.75	186884	03
32	0.089	28.83	2948	01
TOTAL	100.		3317330	

Ref. 16

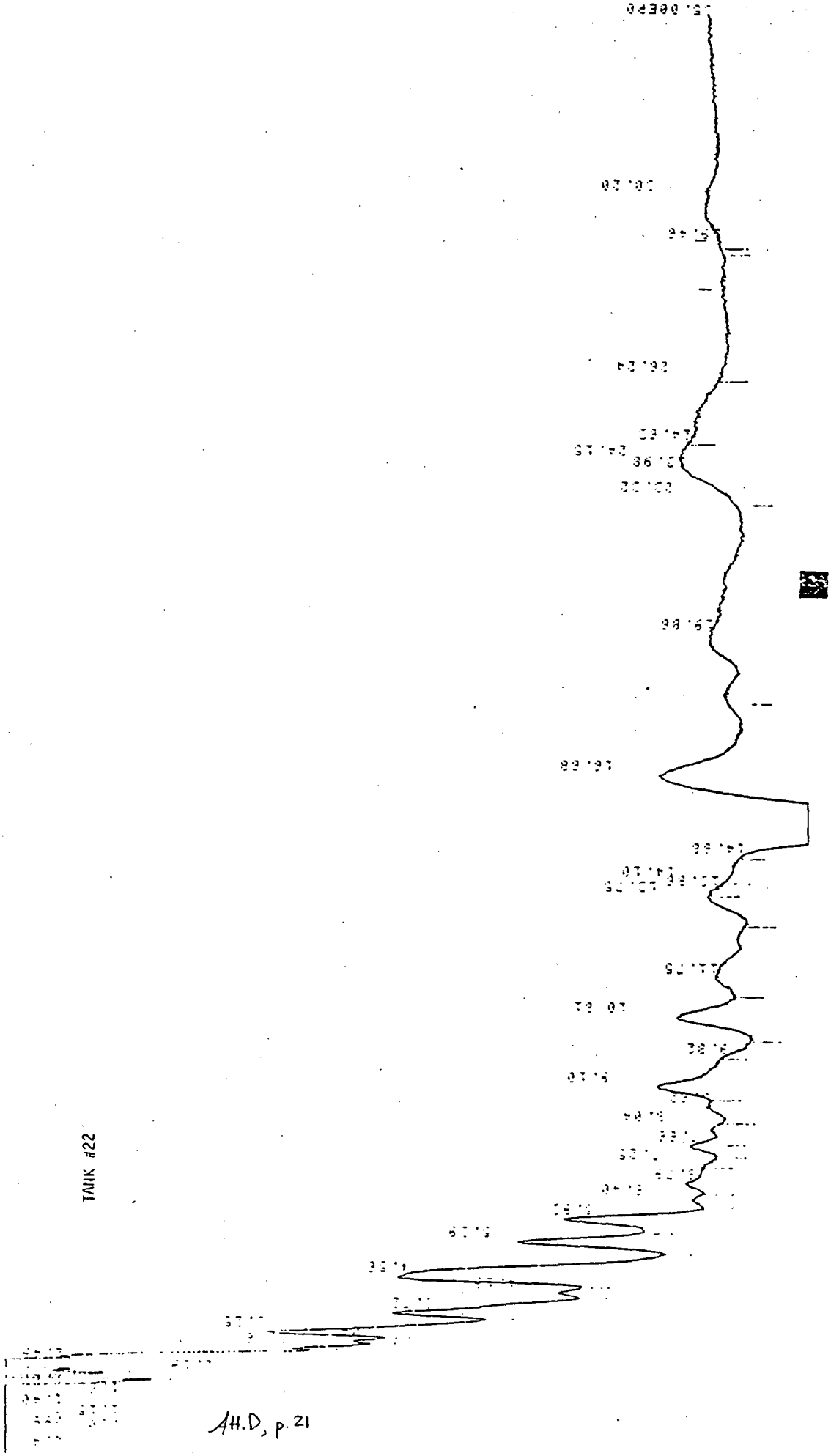
Ref. 16

Att. D, p. 19

SAMPLE BLANK

FILE 1 METHOD 0. RUN 2805:49 INDEX 28

PEAK#	AREA%	RT	AREA	BC
1	39.403	8.35	1281147	82
2	3.048	0.55	99111	02
3	2.346	8.64	76283	02
4	8.595	8.95	279461	02
5	1.86	1.14	60486	82
6	2.134	1.35	69385	82
7	4.523	1.62	147048	82
8	2.464	1.87	80103	82
9	0.446	2.08	14494	82
10	1.57	2.26	51031	02
11	0.988	2.49	32113	02
12	8.922	2.71	29992	02
13	8.463	2.88	15068	82
14	1.119	3.08	36380	02
15	1.297	3.31	42169	82
16	2.113	3.69	68686	02
17	6.643	4.56	215986	82
18	1.4	5.34	45531	82
19	8.59	5.99	19192	82
28	8.556	6.4	18074	02
21	1.692	6.82	55025	82
22	1.87	8.54	60817	82
23	0.927	9.44	30132	82
24	0.195	9.86	6333	82
25	0.108	10.29	3498	82
26	0.464	10.69	15075	82
27	8.323	12.12	10509	82
28	2.078	13.8	67565	82
29	1.351	16.49	43914	82
30	2.658	18.58	86422	82
31	0.33	20.12	18733	02
32	0.446	20.39	14582	02
33	0.233	20.64	7585	82
34	0.145	20.89	4714	82
35	0.321	21.98	10448	02
36	3.778	24.32	122844	82
37	0.458	25.71	14897	02
38	0.091	26.11	2972	82
39	0.051	26.24	1667	83
TOTAL	100.		3251392	



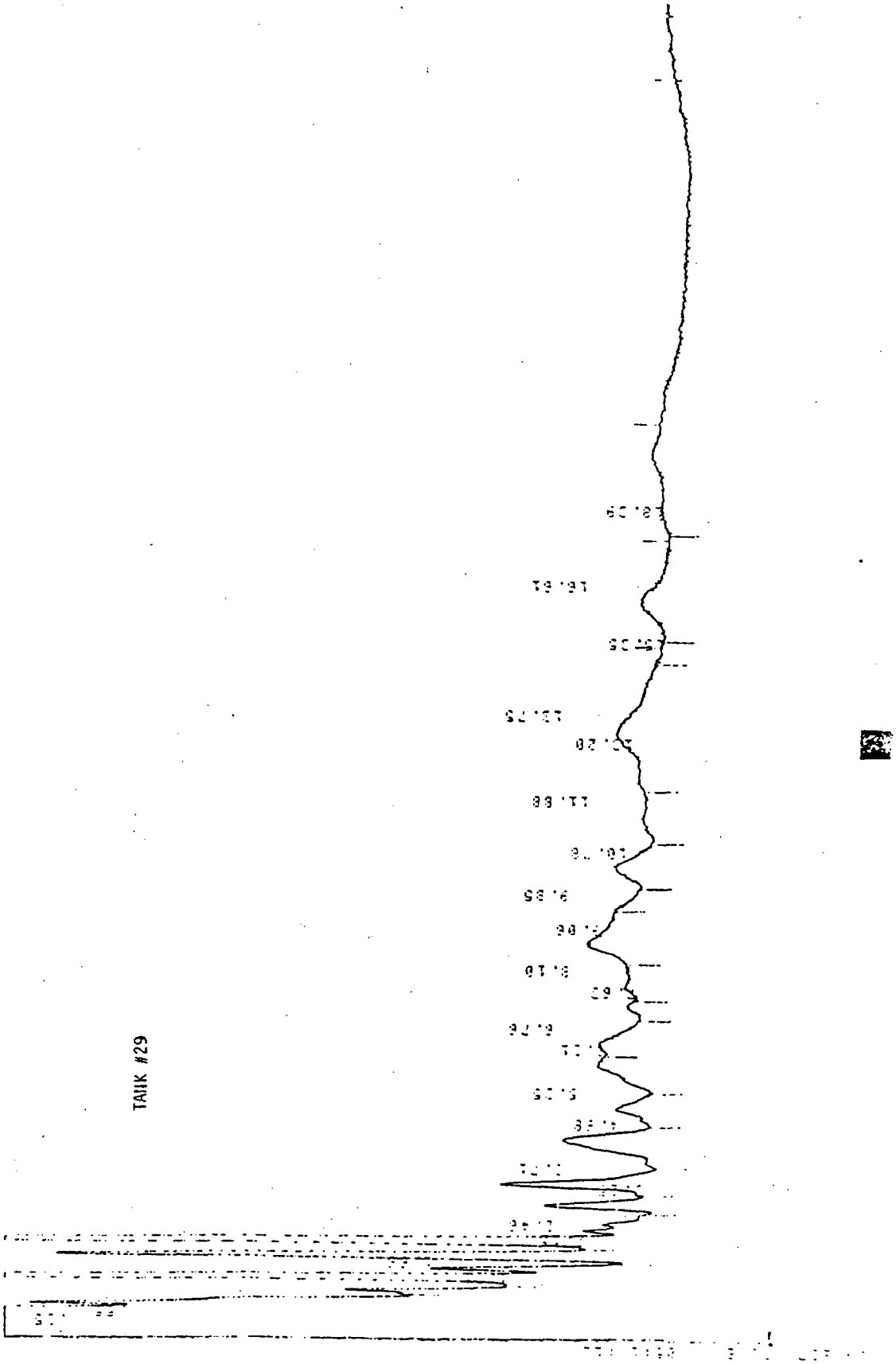
Ref. 16

AH.D, p. 21

04:29:12

FILE 1 METHOD 0. RUN 26 INDEX 26

PEAK#	AREA%	RT	RREA	BC
1	73.216	8.34	28440622	02
2	3.78	8.8	1468310	02
3	3.593	0.88	1395620	02
4	1.36	1.15	528141	02
5	1.833	1.4	401306	02
6	0.96	1.68	372882	02
7	1.861	1.87	412052	02
8	0.396	2.19	153798	02
9	1.458	2.49	566312	02
10	0.228	2.86	88588	02
11	0.167	3.84	64877	02
12	0.598	3.25	232274	02
13	0.536	3.72	208338	02
14	0.183	4.19	71162	02
15	0.736	4.56	285783	02
16	0.393	5.39	152484	02
17	0.371	5.93	144029	02
18	0.148	6.4	57368	02
19	0.305	6.79	118603	02
20	0.105	7.25	40743	02
21	0.228	7.66	88430	02
22	0.187	8.04	72642	02
23	0.234	8.62	90907	02
24	0.595	9.1	231223	02
25	0.233	9.82	90323	02
26	0.625	10.81	242588	02
27	1.056	11.75	410112	02
28	0.475	13.75	184606	02
29	0.179	13.86	69554	02
30	0.393	14.1	152742	02
31	0.32	14.68	124440	02
32	1.344	16.68	522198	02
33	2.648	19.86	1028661	08
34	0.004	23.32	1440	06
35	0.002	23.98	679	06
36	0.233	24.15	90525	02
37	0.377	24.63	146581	02
38	0.12	26.24	46738	03
39	0.001	29.46	220	01
40	0.121	30.2	46897	21
TOTAL	100.		38844798	



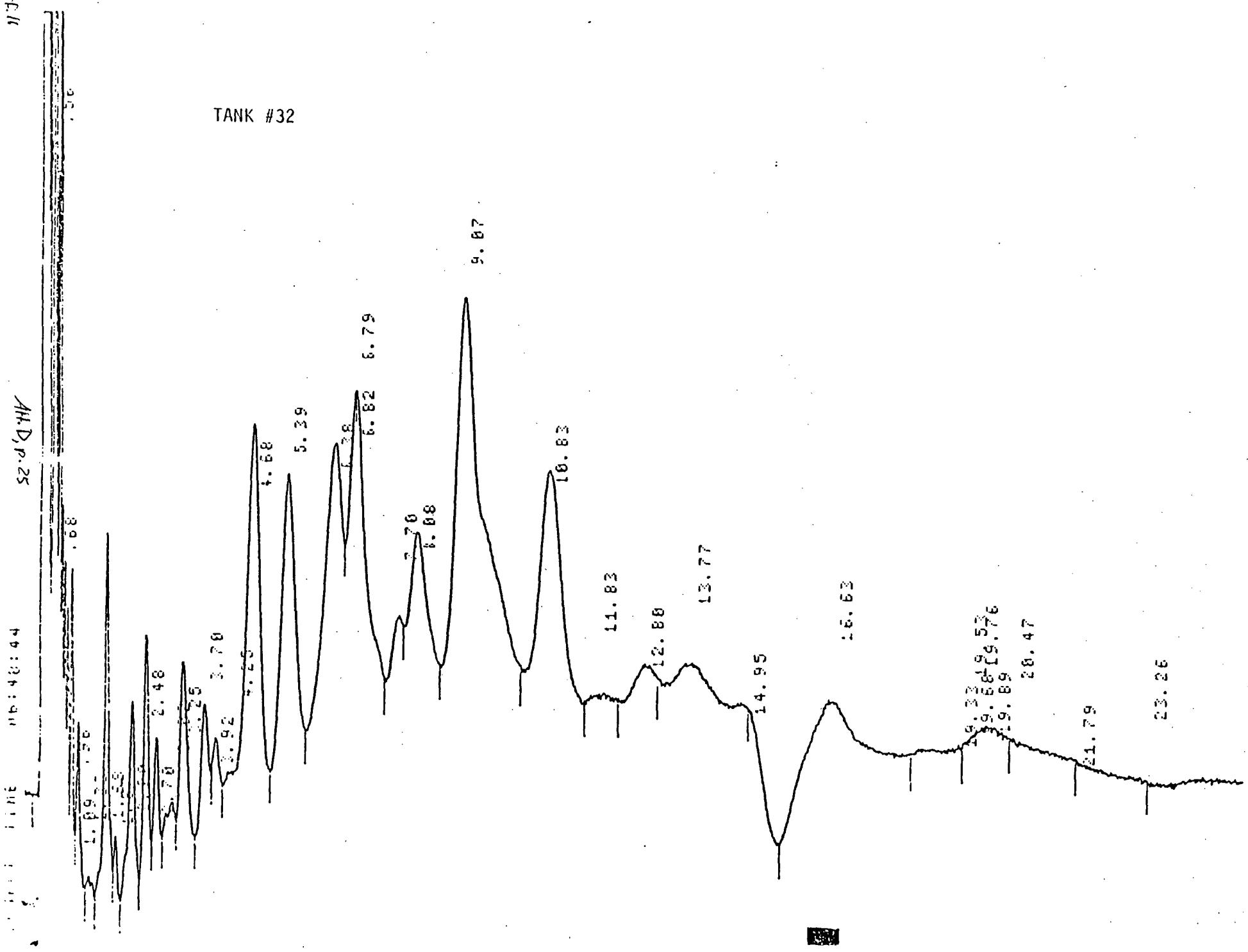
Ref 16

05:17:12

FILE 1 METHOD 0. RUN 27 INDEX 27

PEAK#	AREA%	RT	AREA	BC
1	43.247	0.35	9093216	02
2	47.706	0.55	10030638	02
3	0.318	1.31	66787	02
4	1.513	1.66	318097	02
5	0.617	2.15	129685	02
6	1.233	2.46	259198	02
7	0.307	3.25	64507	02
8	0.457	3.71	95986	02
9	0.602	4.68	126530	02
10	0.381	5.35	80073	02
11	0.508	6.31	106851	02
12	0.451	6.76	94768	02
13	0.2	7.63	42143	02
14	0.336	8.1	70671	02
15	0.644	9.86	135372	02
16	0.202	9.85	42432	02
17	0.334	10.78	70212	02
18	0.236	11.88	49701	02
19	0.151	13.2	31802	02
20	0.402	13.75	84443	02
21	0.005	15.35	1088	03
22	0.099	16.61	20898	01
23	0.052	18.39	10963	01
TOTAL	100.		21026861	

TANK #32



Ref. 11

AH.D, p.25

86:48:44

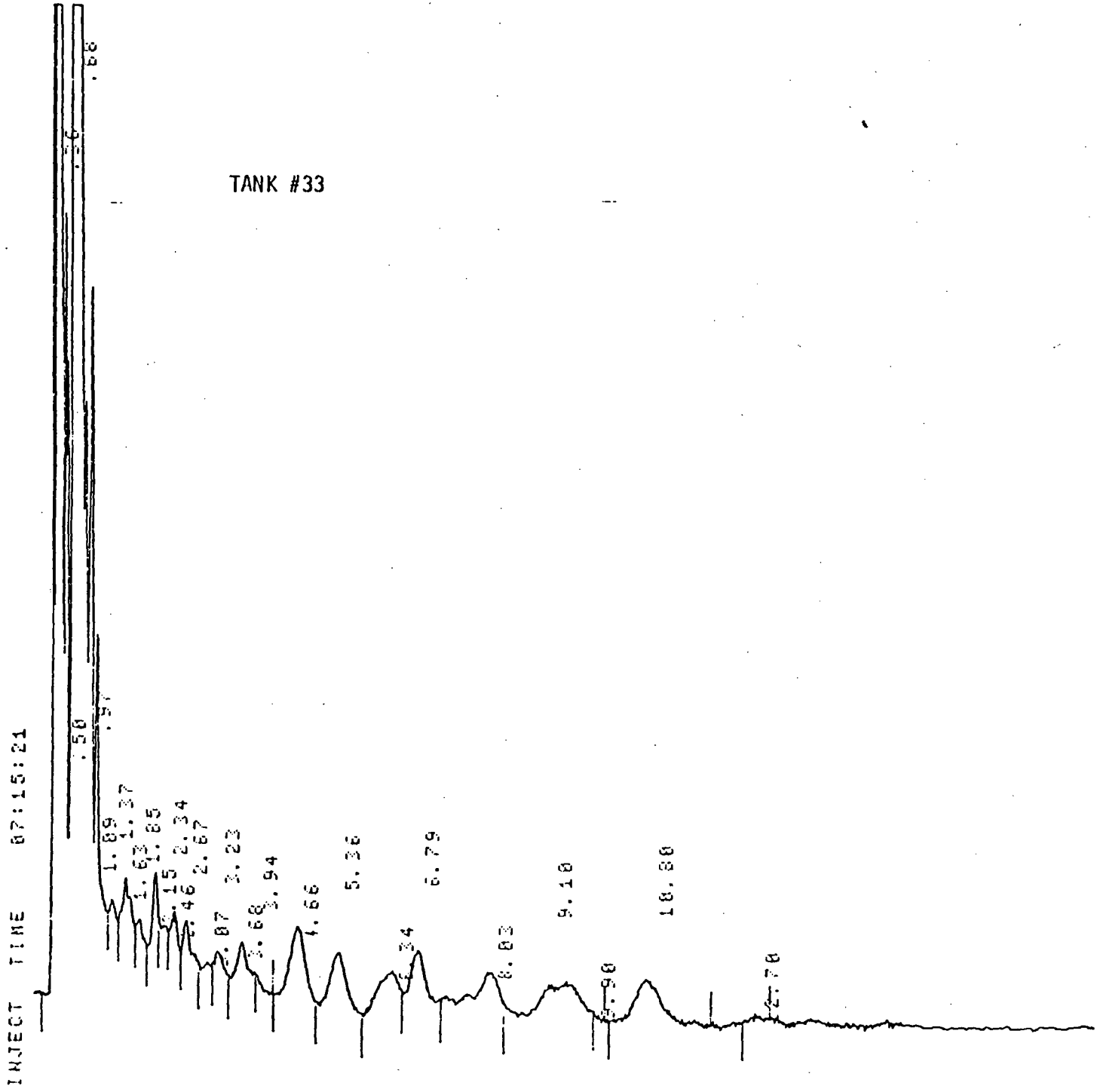
FILE 1 METHOD 0. RUN 30 INDEX 30

PEAK#	RREA%	RT	RREA	BC
1	53.686	0.37	4661699	02
2	1.513	0.56	131383	02
3	1.211	0.68	105194	02
4	0.232	0.96	20180	02
5	0.14	1.09	12186	02
6	0.018	1.33	1535	02
7	0.453	1.68	39369	02
8	0.063	1.87	5486	02
9	0.353	2.2	30658	02
10	0.396	2.48	34381	02
11	0.272	2.7	23578	02
12	0.279	3.02	24247	02
13	0.63	3.25	54665	02
14	0.5	3.7	43408	02
15	0.393	3.92	34129	02
16	0.322	4.25	27997	02
17	2.201	4.63	191132	02
18	2.243	5.39	194748	02
19	2.863	6.30	248619	02
20	1.082	6.79	93934	02
21	2.305	6.82	200179	02
22	1.033	7.7	89693	02
23	2.5	8.08	217124	02
24	6.677	9.07	579768	02
25	3.888	10.83	337588	02
26	1.422	11.83	123457	02
27	1.835	12.8	159327	02
28	3.381	13.77	293599	02
29	0.523	14.95	45429	02
30	2.625	16.63	227964	02
31	1.348	19.33	117056	02
32	0.128	19.53	11136	02
33	0.154	19.68	13379	02
34	0.095	19.76	8256	02
35	0.774	19.89	67218	02
36	1.111	20.47	96511	02
37	0.745	21.79	64650	02
38	0.603	23.26	52368	23
TOTAL	100.		8683230	

Ref. 16

Att. D, p. 27

TANK #33

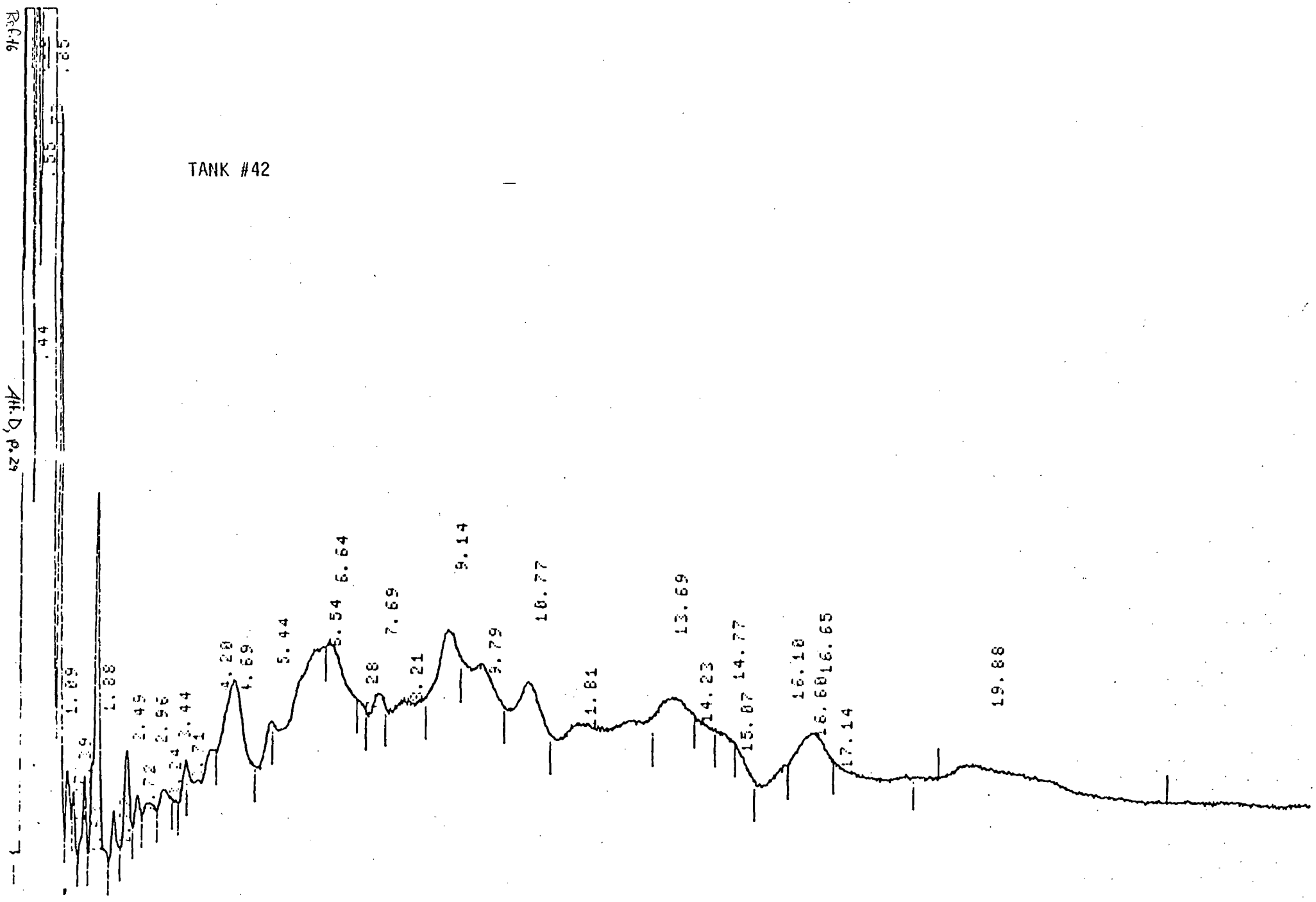


07:15:21

FILE 1 METHOD 0. RUN 31 INDEX 31

PEAK#	AREA%	RT	AREA	0C
1	06.956	0.36	6147330	02
2	0.491	0.5	34725	02
3	7.391	0.68	522478	02
4	0.678	0.97	47958	02
5	0.512	1.09	36215	02
6	0.195	1.37	13785	02
7	0.347	1.63	24523	02
8	8.162	1.85	11445	02
9	0.261	2.15	10455	02
10	0.09	2.34	6369	02
11	0.178	2.46	12564	02
12	0.217	2.67	15357	02
13	0.067	3.07	4756	02
14	0.122	3.23	8590	02
15	0.175	3.60	12364	02
16	0.023	3.94	1652	03
17	0.282	4.66	19919	02
18	0.244	5.36	17230	02
19	0.27	6.34	19059	02
20	0.384	6.79	27125	02
21	0.336	8.03	23779	02
22	0.366	9.1	25887	02
23	0.005	9.9	340	03
24	0.241	10.8	17019	01
25	0.008	12.7	560	01
TOTAL	100.		7069492	

TANK #42



Ref. 46

Att. D, p. 29

06:20:05

FILE 1 METHOD 0. RUN 29 INDEX 29

PEAK#	AREA%	RT	AREA	BC
1	64.331	0.36	4993366	02
2	4.759	0.44	369410	02
3	1.746	0.55	135546	02
4	2.112	0.73	163969	02
5	5.025	0.85	390004	02
6	0.724	1.09	56210	02
7	0.122	1.27	9492	02
8	0.06	1.39	4656	02
9	0.104	1.63	8081	02
10	0.58	1.88	45010	02
11	0.075	2.22	5843	02
12	0.213	2.49	16546	02
13	0.133	2.72	10292	02
14	0.206	2.96	15966	02
15	0.249	3.24	19350	02
16	0.089	3.44	6941	02
17	0.312	3.71	24237	02
18	0.545	4.2	42311	02
19	1.384	4.69	107456	02
20	0.629	5.44	48885	02
21	2.068	6.54	160510	02
22	1.513	6.64	117439	02
23	0.343	7.28	26627	02
24	0.77	7.69	59794	02
25	1.293	8.21	100342	02
26	2.07	9.14	160682	02
27	1.475	9.79	114454	02
28	1.479	10.77	114782	02
29	2.183	11.81	169457	02
30	1.144	13.69	88788	02
31	0.532	14.23	41297	02
32	0.252	14.77	19579	02
33	0.213	15.87	16513	02
34	0.139	16.1	10796	02
35	0.246	16.6	19109	02
36	0.313	16.65	24324	02
37	0.193	17.14	15009	03
38	0.373	19.88	28928	01
TOTAL	100.		7761937	

CHROMATOGRAPHIC CONDITIONS

OPERATOR C. Wojtowicz

DATE February 15, 1982

JOB NUMBER VF-422

SAMPLE IDENTIFICATION 82-72, 82-74

SOLVENT None

ANALYTICAL METHOD

COLUMN

Type Glass

Length 6'

Diameter 2 mm ID

Liquid Phase (% wt.)

3% SP 2250

Support Supelcoport

Mesh 100/120

CARRIER GAS Helium

Rotameter

Inlet Pressure, psig 60

Flow Rate, mL/min. 30

SCAVENGER GAS

SPLIT

FID GAS

Hydrogen, mL/min.

Air, mL/min.

CHART SPEED, cm/min.

DETECTOR Mass Spectrometer

Range 50 - 500 amu

Attenuation

TEMPERATURE, °C

Detector

Injection Port 225°

Column

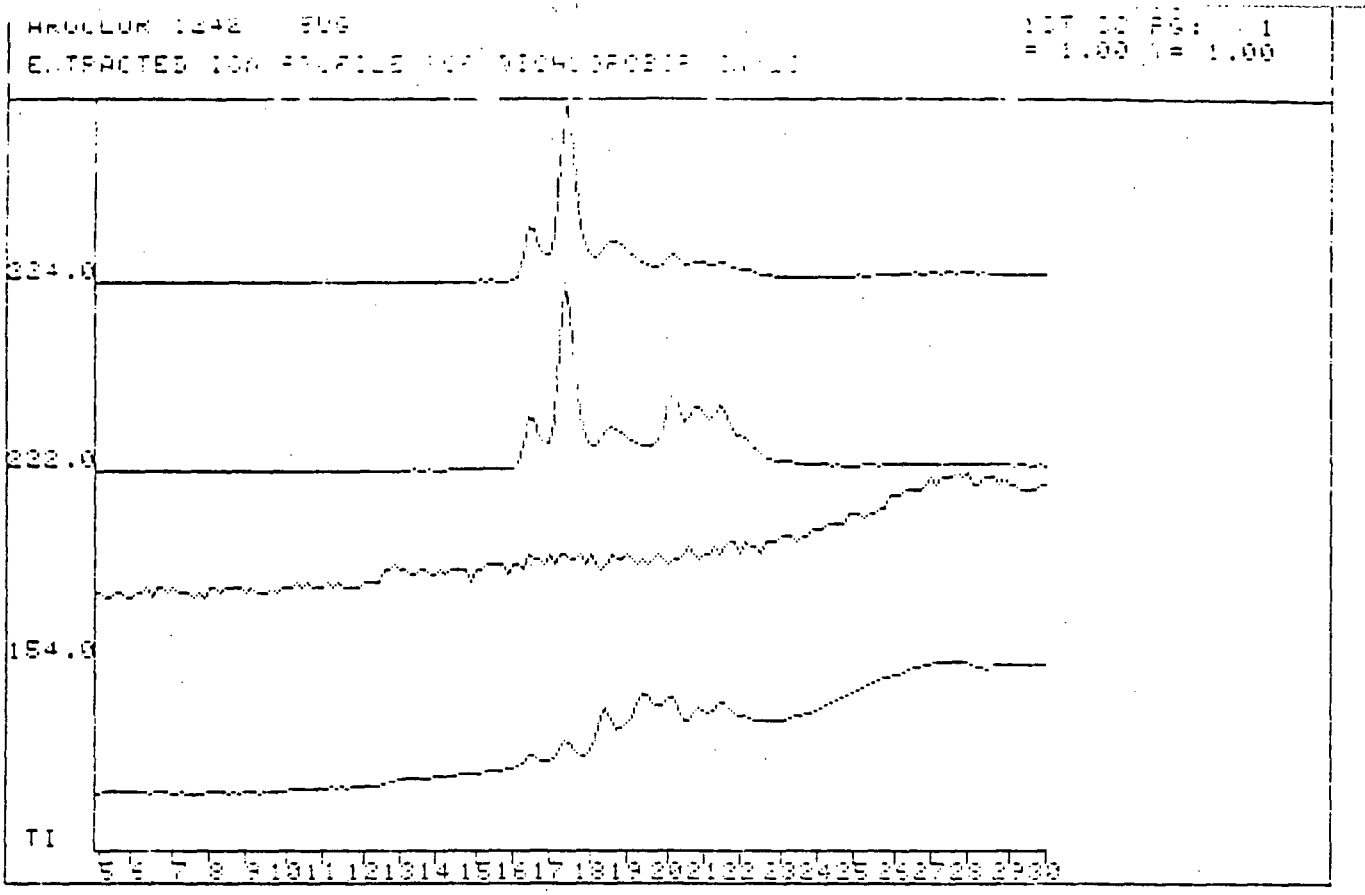
Initial 100°/5 min

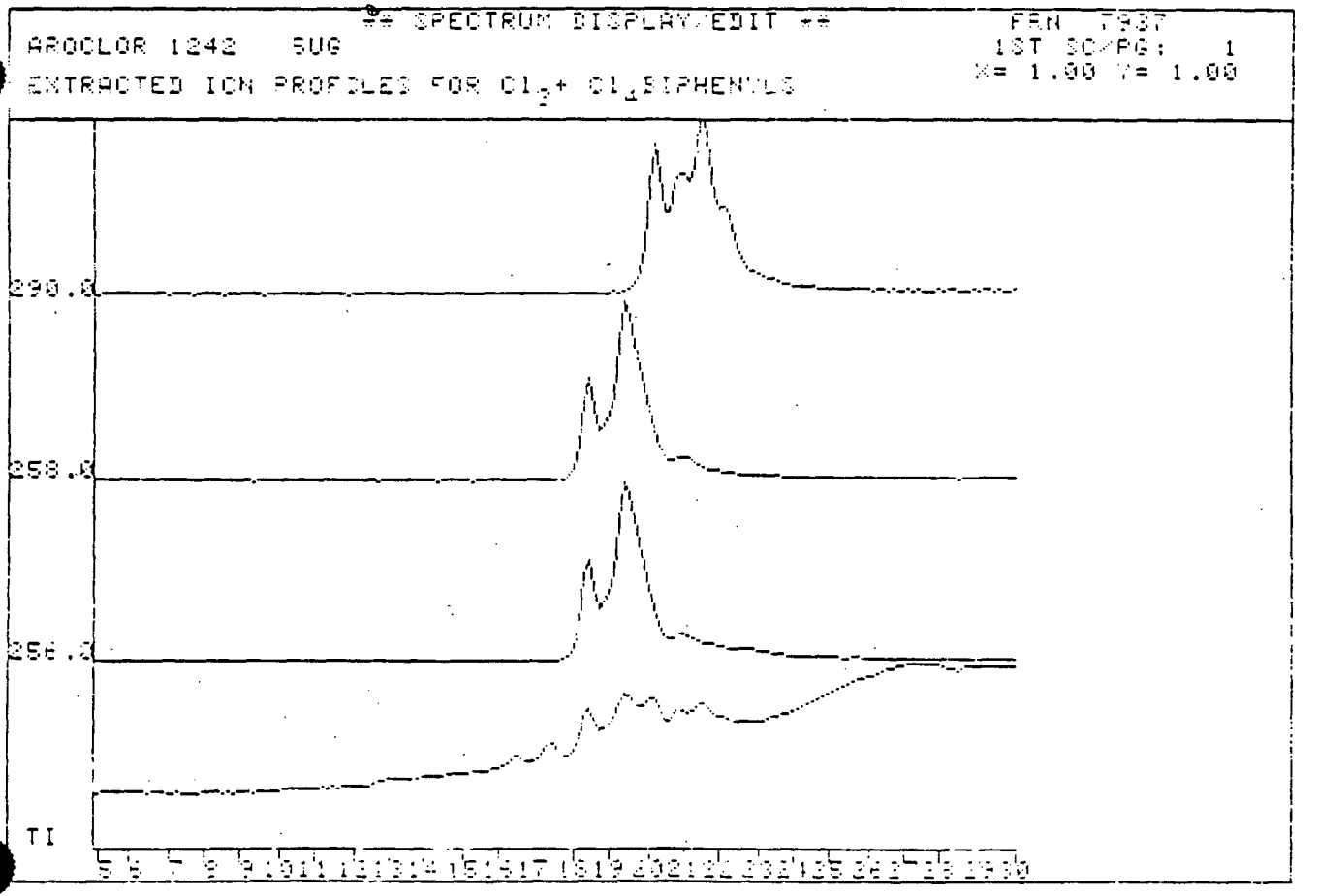
Program 10°/min

Final 270°

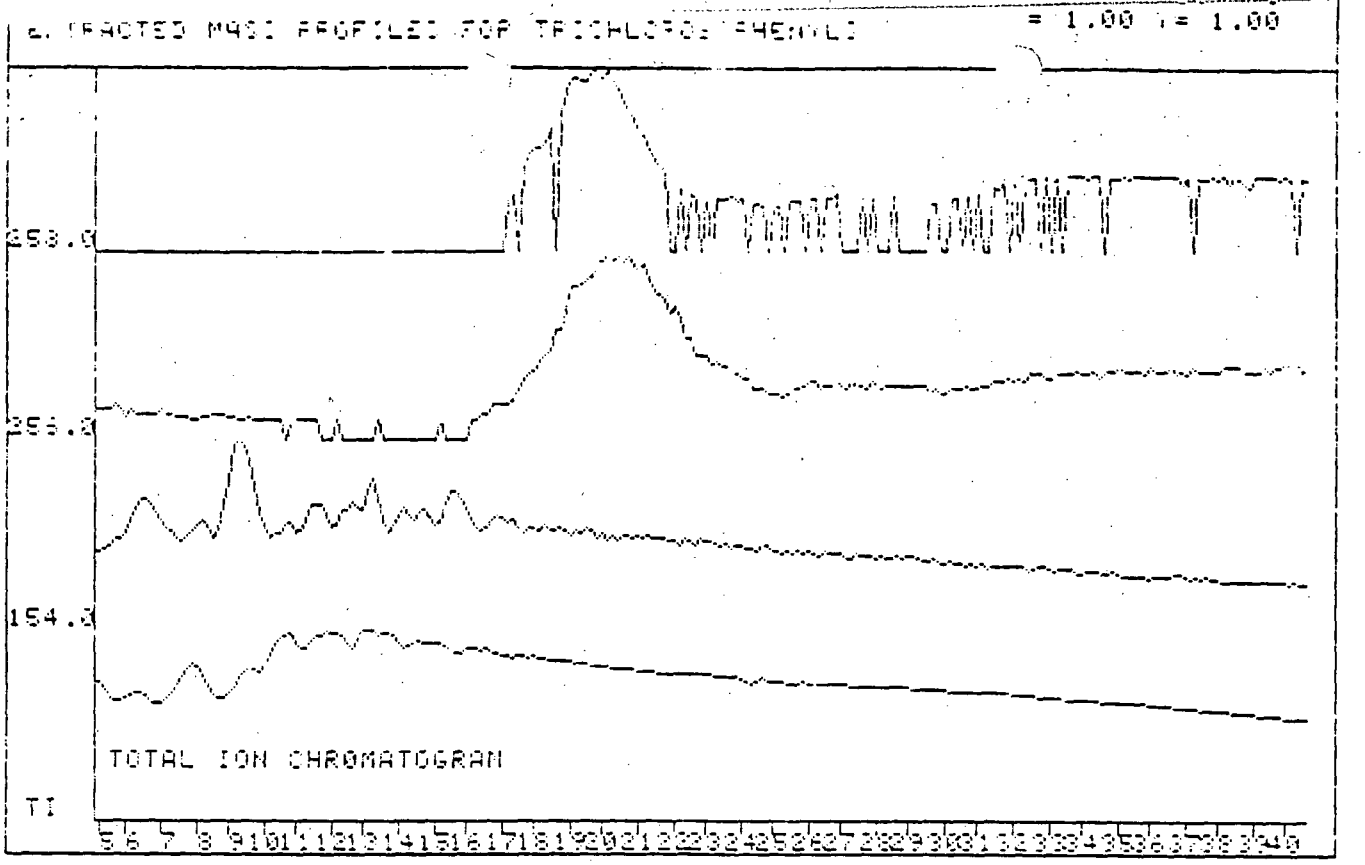
INSTRUMENT HP 5993 GC/MS

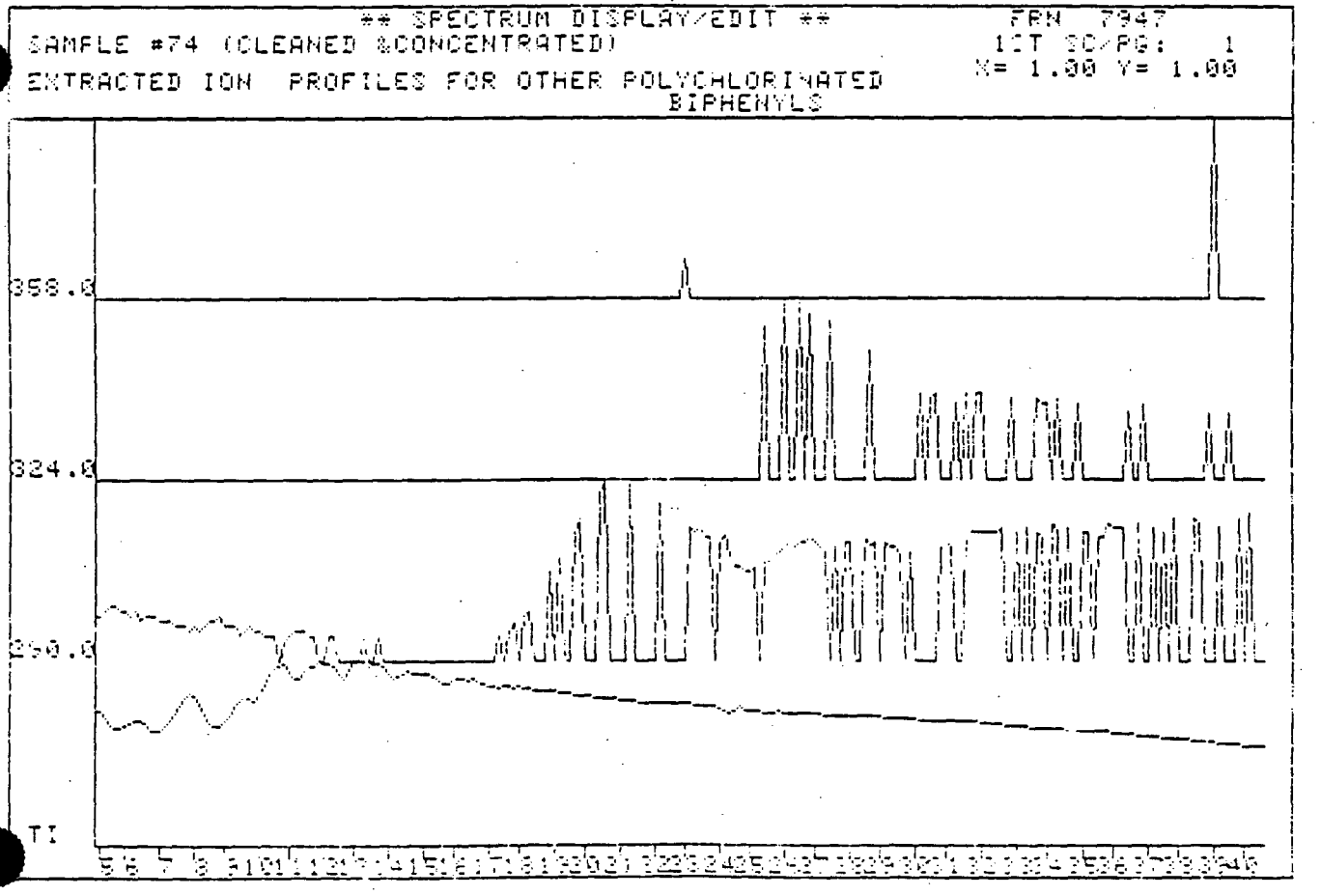
Ref. 16


AROCLOR 1242 SUG
1ST SC PG: 1
X= 1.00 Y= 1.00
324.0
222.0
154.0
TI

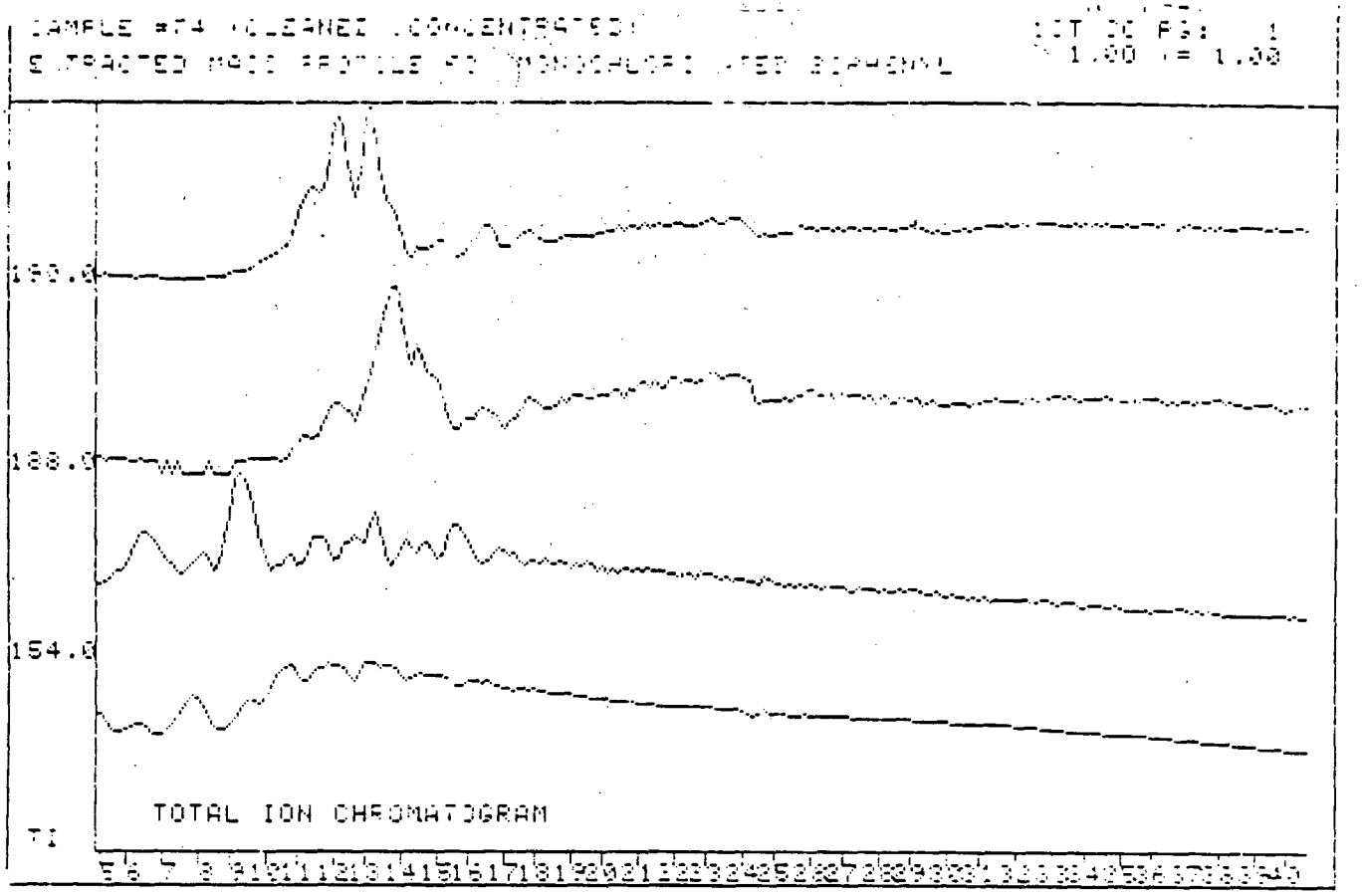

** SPECTRUM DISPLAY/EDIT **
AROCLOR 1242 SUG
1ST SC/PG: 1
X= 1.00 Y= 1.00
EXTRACTED ION PROFILES FOR Cl3+ Cl4BIPHENYLS
290.0
258.0
256.0
TI

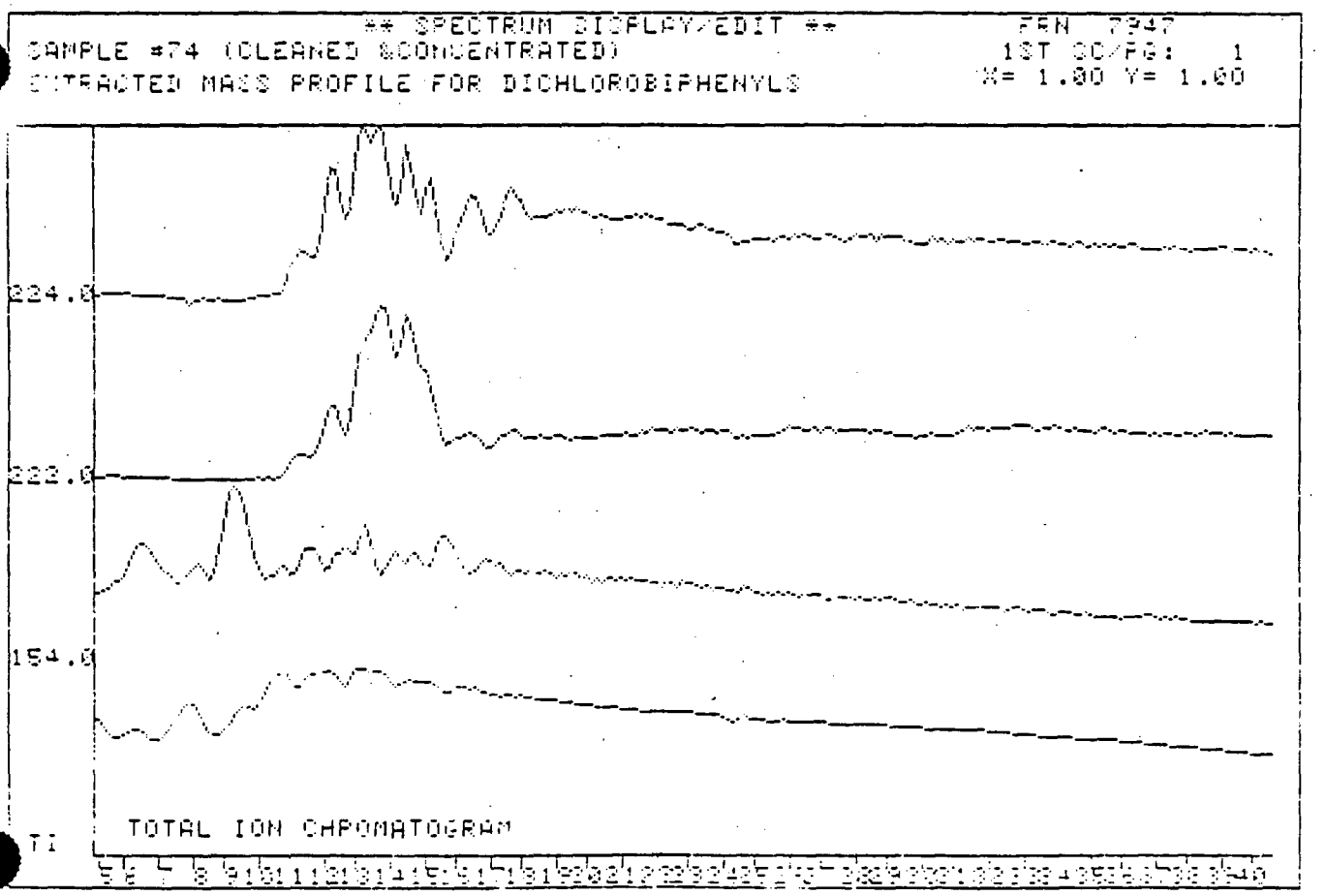
Ref. 16


EXTRACTED MASS PROFILES FOR TRICHLORO PHENYLS
= 1.00 Y= 1.00
253.0
254.0
154.0
TOTAL ION CHROMATOGRAM
TI

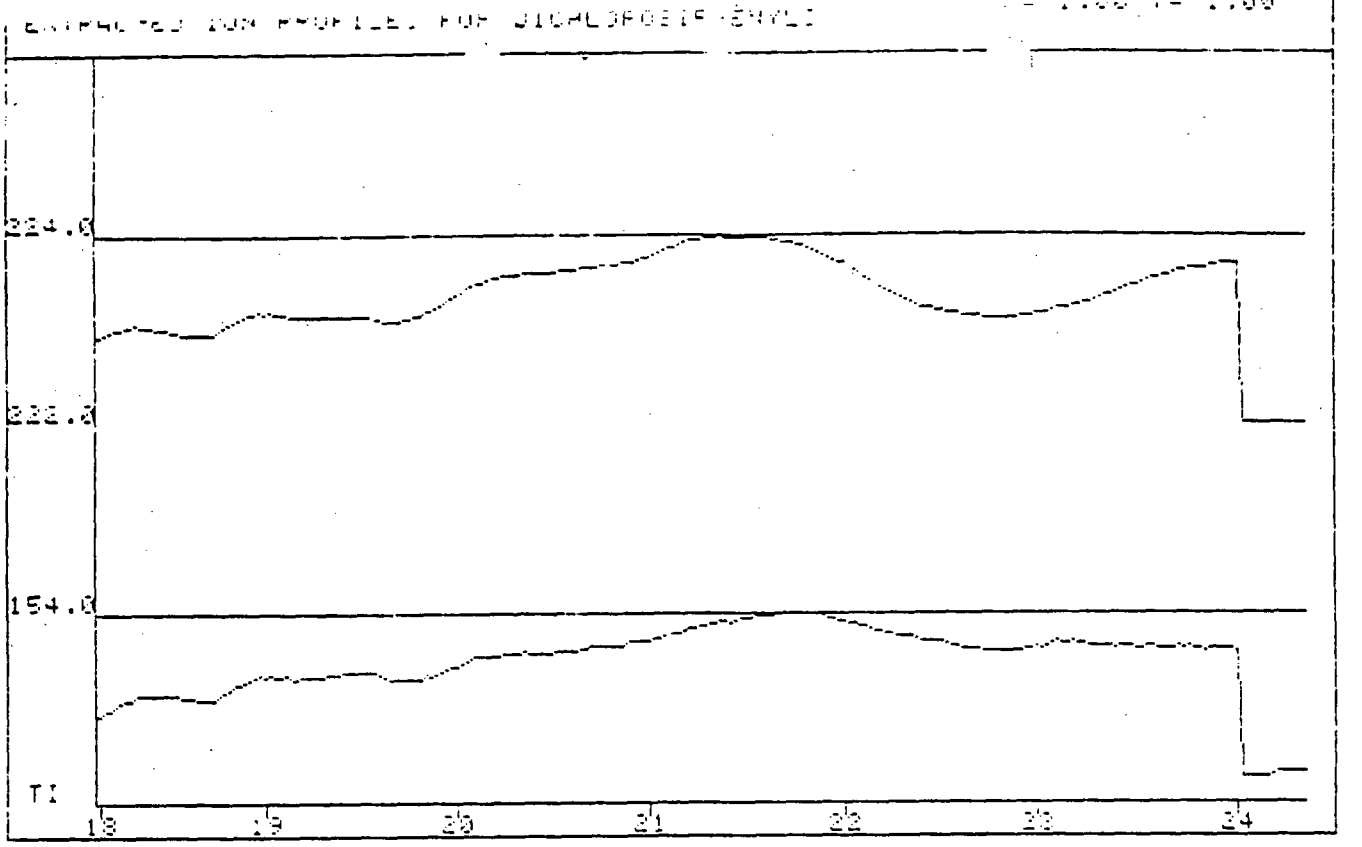

** SPECTRUM DISPLAY/EDIT **
FRN 7947
SAMPLE #74 (CLEANED &CONCENTRATED)
1CT SC/PG: 1
X= 1.00 Y= 1.00
EXTRACTED ION PROFILES FOR OTHER POLYCHLORINATED BIPHENYLS
358.0
324.0
290.0
TI

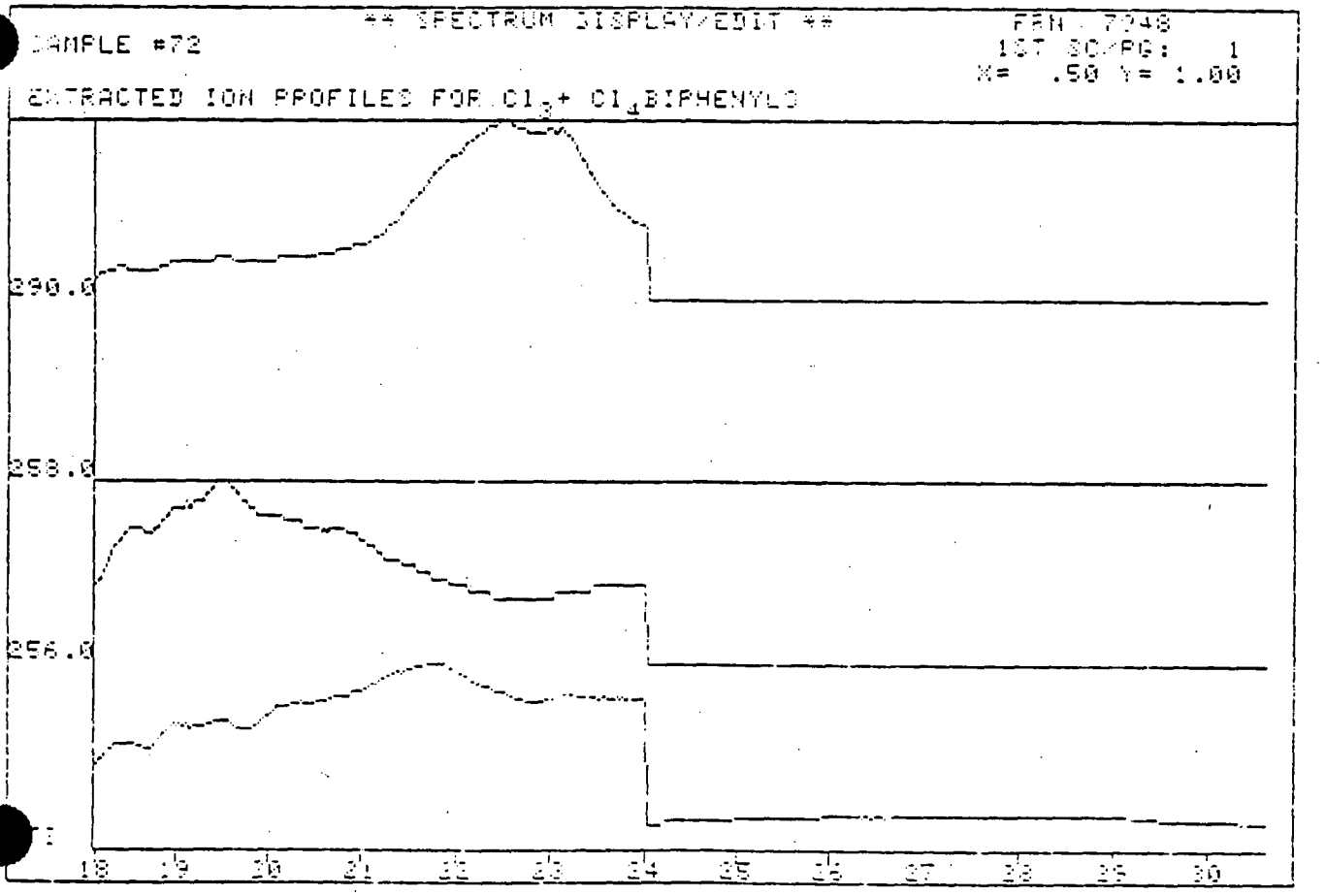
Ref. 16


TOTAL ION CHROMATOGRAM
TI


** SPECTRUM DISPLAY/EDIT **
FRN 7947
SAMPLE #74 (CLEANED &CONCENTRATED)
1ST SC/PG: 1
EXTRACTED MASS PROFILE FOR DICHLOROBIPHENYLS
X= 1.00 Y= 1.00
224.0
222.0
154.0
TOTAL ION CHROMATOGRAM
TI

Ref. 16


224.0
232.0
154.0
TI
18
19
20
21
22
23
24


** SPECTRUM DISPLAY/EDIT **
SAMPLE #72
SCAN 7248
1ST SC/PG: 1
X= .50 Y= 1.00
EXTRACTED ION PROFILES FOR Cl3+ Cl4BIPHENYLS
290.0
258.0
256.0
18
19
20
21
22
23
24
25
26
27
28
29
30

Ref. 16

ecology and environment, inc.
195 SUGG ROAD, P.O. BOX D, BUFFALO, NEW YORK 14225, TEL. 716-632-4491, TELEX 91-9183
International Specialists in the Environmental Sciences

February 7, 1984

Mr. Phillip Yeany
State of New Jersey
Office of Regulatory Services
Department of Environmental Protection
C.N. 402
Trenton, NJ 08625

Dear Mr. Yeany:

As requested by Mr. Ernie Roth of Valley Forge Engineering, Inc., Ecology and Environment, Inc., (E & E) is enclosing a copy of the report for the preliminary soil and tank sampling program E & E conducted at the Borne Chemical Company in Elizabeth, New Jersey, on January 4, 1984.

Sincerely,

Peter J. Gorton

Peter J. Gorton
Staff Hazardous Waste Specialist

PJS/jb
enc.

RECEIVED
FEB 14 1984
OFFICE OF REGULATORY SERVICES
DEPT. ENVIRONM. PROTECTION

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Ref. 16

Att. E, p.1

VF-279-0671

PRELIMINARY SOIL AND TANK SAMPLING PROGRAM

February 1, 1984

Prepared for:

VALLEY FORGE ENGINEERING, INC.
399 Radnor-Chester Road
Villanova, Pennsylvania 19085

ecology and environment, inc.

195 SUGG ROAD, P.O. BOX D, BUFFALO, NEW YORK 14225, TEL. 716-632-4491

International Specialists in the Environmental Sciences

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2	SAMPLE COLLECTION	2-1
3	ANALYTICAL METHODS	3-1
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4-2	Gas Chromatograph/Mass Spectrometer Operating Conditions	4-4

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1. INTRODUCTION AND SUMMARY

Ecology and Environment, Inc., (E & E) was contracted by Valley Forge Engineering, Inc., to collect soil samples at the Borne Chemical Company's Front Street facility in Elizabeth, New Jersey. Seven surface and three subsurface samples were collected on January 4, 1984, and analyzed by E & E's Analytical Services Center (ASC) for polychlorinated biphenyls (PCBs). In addition, two tank samples were obtained from Mr. Ernie Roth of Valley Forge Engineering and analyzed by the ASC for PCS contamination.

The sampling area consisted of an outside storage yard containing 22 vertical and one horizontal bulk storage tanks. Seven surface locations thought to be representative of areas of potential contamination across the site were selected as soil sampling locations. Soil samples were to be obtained at the zero- to six-inch level and at subsurface levels of one to two feet at each location. The two vertical tanks sampled, tank 22 and tank 42, were selected by Mr. Roth. Sample location numbers and specific depths are given in Table 1-1. Figure 1-1 shows the specific sample locations.

At a detection level of 0.05 parts per million (ppm), no PCBs were found in any of the soil samples. At detection levels of 2.5 and 5.0 ppm for the various PCB Aroclors, no PCBs were found in either of the two oil samples collected.

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Table 1-1

SAMPLE LOCATION NUMBERS AND SPECIFIC DEPTHS

Sample Location No.*	Sample Description
CS-1-0-6	Composite soil 1 at 0 to 6 Inches
CS-2-0-6	Composite soil 2 at 0 to 6 Inches
CS-2-36	Composite soil 2 at 10 to 16 inches
CS-3-0-6	Composite soil 3 at 0 to 6 inches
CS-3-36	Composite soil 3 at 20 to 26 inches
CS-4-0-6	Composite soil 4 at 0 to 6 inches
CS-5-0-6	Composite soil 5 at 0 to 6 inches
CS-6-0-6	Composite soil 6 at 0 to 6 inches
CS-7-0-6	Composite soil 7 at 0 to 6 inches
CS-7-36	Composite soil 7 at 15 to 21 Inches
Tank 22	Oil sample, tank 22
Tank 42	Oil sample, tank 42

*CS: Composite soil sample
1-7: Specific soil sample location
0-6: Zero- to six-inch depth
36: Subsurface sample not to exceed 36-inch depth

Source: Ecology and Environment, Inc. 1984.

Ref. 16

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Ref. 16

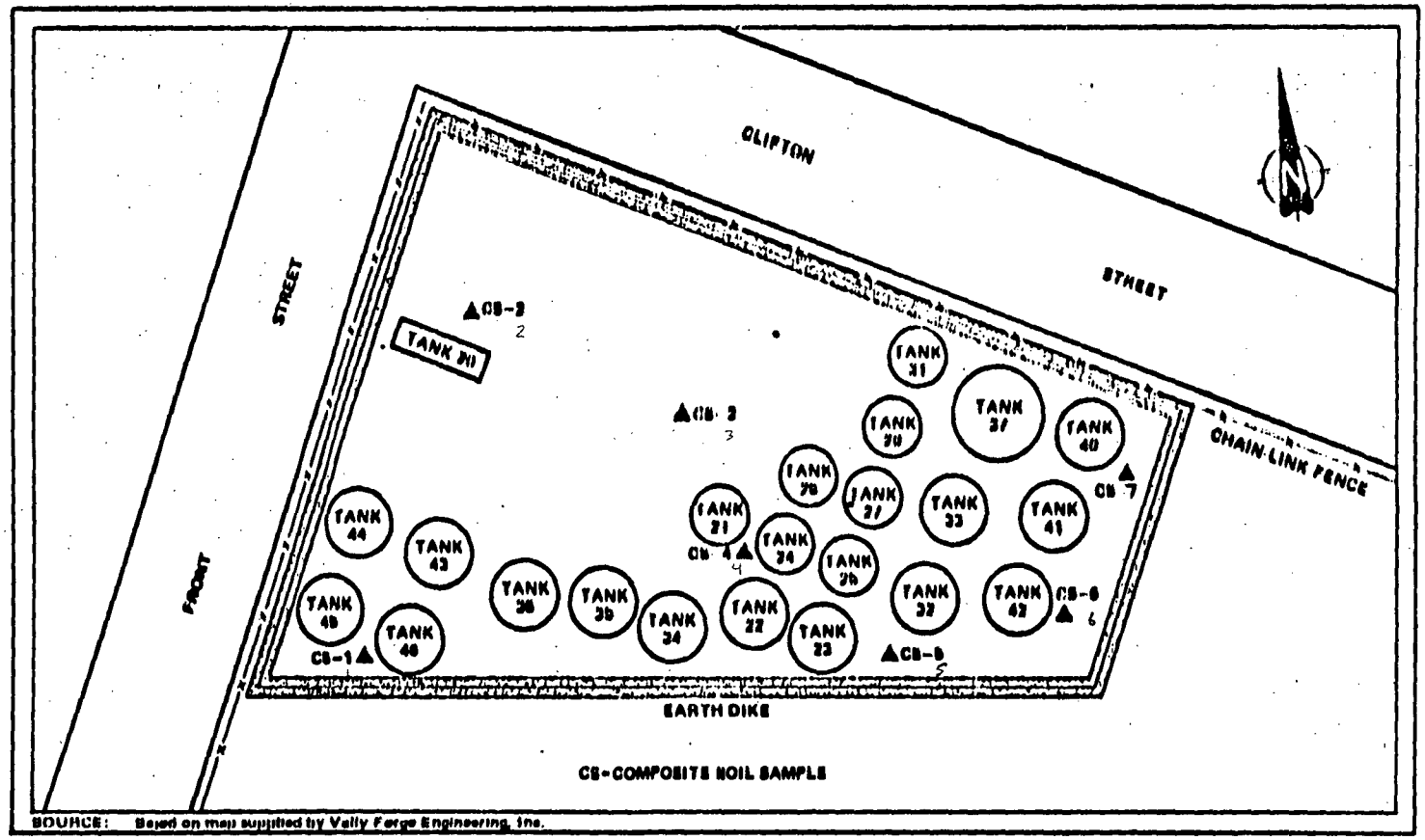

Figure 1–1 SAMPLE LOCATIONS

Att. E, p. 7

2. SAMPLE COLLECTION

On January 4, 1984, a preliminary site sampling investigation was conducted by Mr. Peter Gorton of E & E's technical staff at the Borne Chemical Company facility. An initial site survey was performed by Mr. Gorton and Mr. Roth of Valley Forge Engineering to Identify and mark sample locations. The following criteria were used to determine exact sampling locations:

- Tank distribution;
- Stained or discolored surface soil; and
- Incorporation of north, south, east, west, and mid-site locations.

At five sample locations, a hand auger was used to obtain surface samples at a depth of zero tp six inches. At two locations, due to frozen soil conditions, a handpick had to be used to obtain the required sample. Also due to frozen soil conditions, subsurface sampling was possible at only three of the seven locations. Subsurface sample depths at these locations were chosen on the basis of apparent staining or discoloration of the soil. Photographs were taken of each sample location and the storage yard for documentation purposes. In addition, a field data notebook was kept to record all on-site observations and pertinent information. The field logbook and photographic documentation are part of the project file and have been retained by E & E.

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Soil samples were placed in laboratory-prepared, 16-ounce, wide-mouth jars using sample-dedicated stainless steel teaspoons. The hand auger and pick were washed with deionized water between each sample location. Unsampled auger cuttings were replaced into the boreholes and survey flags were inserted to mark sacple locations.

During the soil sampling effort, Mr. Roth obtained one oil sample each from vertical tanks 22 and 42. Mr. Roth used a Bacon Bonb sampler to retrieve a representative sample fron the tanks' surface layers. These samples also were placed in laboratory-prepared, 16-ounce jars.

The samples were shipped for analysis via Priority 1 Federal Express to E & E's ASC in Buffalo, New York, in acccrdance with standard E & E chain-of-custody procedures. The chain-cf-custody form, detailing possesslon of the samples for this project, is included in this report as Appendix A.

Ref. 16

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3. ANALYTICAL METHODS

E & E's analytical method for the analysis of PCBs in oils is derived from "The Analysis of Polychlorinated Biphenyls in Transformer Fluid and Waste Oil," an interim method published by the Environmental Monitoring and Support Laboratory, Office of Research and Development, USEPA, Cincinnati, Ohio, June 24, 1980. The method for PCS analysis in soils is taken from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, Second Edition, USEPA, 1982. Chromatographic conditions are presented in Table 3-1.

The oil samples and the soil samples were analyzed according to the above analytical methods. The samples were submitted to a florl-sil column cleanup step in addition to an acid and mercury cleanup step.

Ref 16

Att. E, p. 10

Table 5-1

CHROMATOGRAPHIC CONDITIONS FOR POLYCHLORINATED BIPHENYLS

Operator t. Franzek

Job Number VF-279

Solvent Hexane

Instrument Varian 3TOC CC

Date January 23, 1984

Sample Identification 84-20-31

Analytical Method SW-846

COLUMN

Type Glass

Length 6'

Diameter 1/4"

Liquid Phase (% wt.) At SE-30

6% OF-1

Support Supelcoport

Mean 100/120

CARRIER GAS Nitrogen

Rotameter 25

Inlet Pressure, psig 60

Flow Rate, ml/min. 30

SCAVENGER GAS

SPLIT

HALL DETECTOR

Mode

Solvent

Solvent flow, mL/min.

Reactor tube temperature, °C

Reactor gas

Reactor gas flow, mL/min.

FID GAS

Hydrogen, mL/min.

Air, mL/min.

CHART SPEED, cm/min. 0.5

DETECTOR Electron capture

Range 10^{-12}

Attenuation 256

TEMPERATURE, °C

Detector 330

Injection Port 220

Column

Initial 200

Program

Final

PURGE AND TRAP

Purge time Temp.

Purge flow

Desorb time Temp.

Bake time Temp.

238C82

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Ref. 16

4. RESULTS

The analytical results are presented in Table 4-1. The chromatograms were compared with those of Aroclors 1221, 1260, 1248, 1242, 1232, 1016, and 1254. None of these PCB compounds were identified in any of the soil samples or in the oil sample taken from tank 42.

The oil sample from tank 22 contained a pattern similar to that of Aroclor 1254. Further analysis of the tank 22 sample by gas chromatograph/mass spectrometry (GC/MS), however, failed to confirm the presence of Aroclor 1254. The sample was examined for the ions specific to Aroclor 1254, but they were not found to be in the correct pattern or the correct retention times. The GC/MS operating conditions are presented in Figure 4-2.

In summary, no detectable quantities of PCBs were found in any of the samples taken from the Berne Chemical Company site in Elizabeth, New Jersey.

Ref. 16

AH. E, p. 12

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International Specialists in the Environmental Sciences

LABORATORY REPORT

FOR

VALLEY FORGE ENGINEERING

Job No.: YF-279

Sample Date: 1/4/84 Sampled By: Ecology and Environment, Inc.

Date Received: 1/5/84 Delivered By: Ecology and Environment, Inc.

E & E Lab Number	84-	20	21	22	23	24	25
Sample Identity		CS1-0-6	CS2-0-6	SC2-35	CS7-0-6	SC7-36	CS6-0-6
Aroclor 1254, ppm		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1232, ppm		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1016, ppm		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1221, ppm		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1248, ppm		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1242, ppm		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aroclor 1260, ppm		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Supervising Analyst D. Hin

Date: 1-25-84

Table 4-1
ANALYTICAL RESULTS

Ref. 16

4H. E, p.13

ecology and environment, inc.
International Specialists in the Environmental Sciences

LABORATORY REPORT

FOR

VALLEY FORGE ENGINEERING

Job No.: VF-279

SampTe Oate: 1/4/84 Sampled By: Ecology and Environment, Inc.

Date Received: 1/S/84 Delivered By: Ecology and Environment, Inc.

E & E Lab Number 84-	26	27	28	29	30	31
Sample Identity	CS3-0-6	CS3-36	CS4-0-6	CS5-0-6	Tank 22	Tank 42
Aroclor 1254, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0
Aroclor 1232, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0
Aroclor 1016, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 5.0	< 5.0
Aroclor 1221, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 2.5	< 2.5
Aroclor 1248, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 2.5	< 2.5
Aroclor 1242, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 2.5	< 2.5
Aroclor 1260, ppm	< 0.05	< 0.05	< 0.05	< 0.05	< 2.5	< 2.5

Supervising Analyst M. Hain

Date: 1-25-84

Table 4-1
ANALYTICAL RESULTS (Cont.)

Ref. 16

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Table 4-2

CC/MS OPERATING CONDITIONS

Operator C. Wojtowicz

Date January 23, 1984

Job Number WF-279

Sample Identification S4-30

Solvent Hexane

Analytical Method EPA 625

Instrument HP59938 CC/MS

EPA 600/4-82-057

COLUMN

Type Glass

Length 6'

Diameter 2mm ID

Liquid Phase (% wt.) 3% SP 2250

Support Supelcoport

Mesh 100/120

CARRIER GAS Helium

Rotameter 60

Inlet Pressure, psig 15

Flow Rate, ml/min. 30

SCAVENGER GAS _____

SPLIT _____

HALL DETECTOR

Mode _____

Solvent _____

Solvent Flow, mL/min. _____

Reactor tube temperature, °C _____

Reactor gas _____

Reactor gas flow, ml/min. _____

FID GAS

Hydrogen, mL/min. _____

Air, mL/min. _____

CHART SPEED, cm/min. _____

DETECTOR Mass Spectrometer

Range 50-500 a.m.u.

Attenuation _____

TEMPERATURE, °C

Detector _____

Injection Port 225°

Oven

Initial 75°/5 min

Program 10°/min

Final 275

PURGE AND TRAP

Purge time _____ Temp. _____

Purge Flow _____

Desorb time _____ Temp. _____

Bake time _____ Temp. _____

238082

Ref. 11

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APPENDIX A

CHAIN-OF-CUSTODY RECORD

Ref. 16

Att. E, p. 16

ecology and environment, inc.

International Trade Building, 700 Ellicott Street, Buffalo, New York 14203

CHAIN OF CUSTODY RECORD

Project No.: UF-204

Project Name: BOLNE CHEMICAL CO.

Samplers (Signature): Peter J. Gorton

Sta. No.	Date	Time	Comp.	Grab	Station Location	No. of Containers	Parameters 1,4	Parameters 2,3	Parameters 5,6	Parameters 7,8	Parameters 9,10	Parameters 11,12	Remarks	
CS1-06	1/4/84	0944	✓		[illegible]	1 liter	✓	✓						20
CS2-06	1/4/84	1127	✓		[illegible]	1 liter	✓	✓						21
CS2-36	1/4/84	1129	✓		[illegible]	1 liter	✓	✓						22
CS7-06	1/4/84	1215	✓		[illegible]	1 liter	✓	✓						23
CS7-36	1/4/84	1236	✓		[illegible]	1 liter	✓	✓						24
CS6-06	1/4/84	1202	✓		[illegible]	1 liter	✓	✓						25
CS3-06	1/4/84	1315	✓		[illegible]	1 liter	✓	✓						26
CS3-36	1/4/84	1333	✓		[illegible]	1 liter	✓	✓						27
CS4-06	1/4/84	1314	✓		[illegible]	1 liter	✓	✓						28
CS5-01	1/4/84	1415	✓		composite sample of 0-6 inch depth	1 liter	✓	✓						29
TANK 22	1/4/84	1230		✓	GRAB OIL FROM TANK 22	1 liter	*	*	✓	✓	✓	✓	*PCB ALSO - HANDLE UNDER HOOD	30
TANK 42	1/4/84	1235		✓	GRAB OIL FROM TANK 42	1 liter	*		✓	✓	✓	✓	*PCB ANALYSIS ALSO - HANDLE UNDER HOOD	31

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Peter J. Gorton	1/4/84 1710				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature) Linda Franzak	Date/Time 1/4/84 1100	Remarks	

A-2

Ref. 16

Att. E, p. 17

Form ADM-012

20-01-07 Borne

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Dave Schrier **DATE** 3/21/85

FROM Wayne Howitz WH

SUBJECT Sample analysis classification

Attached are sample analysis that require a hazardous or nonhazardous classification.

Sample #	Test Report #	Sample obtained from	Case #
FAS018	SR10445-1	Drum #FAS018	20-04-07
FAS019	SR10445-2	Drum #FAS019	20-04-07
FAS020	SR10445-3	Drum #FAS020	20-04-07

F07:sm
Attachment
c.: F. Sickels

Ref. 16

AH. F, p.1

S-R ANALYTICAL INC.
28 Springdale Rd., Cherry Hill, N.J. 08003
(609) 751-1122 (215) 923-2068

March 12, 1985

NJDEP
Division of Waste Management
120 Route 156
Yardville, NJ 08620

Attention: Mr. Wayne Howitz

Reference: Test Report No. SR10445, Supplemental; DWM Samples Nos. FAS018, FAS019, FAS020

This report covers the supplemental analysis of three (3) non-aqueous samples originally submitted to S-R Analytical, Inc. (S-R) on November 9, 1984. The following analyses were requested:

- Distillation
- Base/Neutral Extractabie Organics

This report is organized in the following manner:

- Methodology
- Analytical Results
- Quality Assurance Data
- Method Detection Limits and Accuracy Statements

Ref 16

Att. F, p.2

S-R ANALYTICAL INC.

I. Methodology

Base/Neutral Extractable Organics

Solid and soil samples are prepared according to the following procedure:

A known weight of sample is soxhlet-extracted with 70 ml of pesticide-grade methylene chloride for a minimum of six hours. The extract is then transferred to a Kuderna-Danish apparatus and evaporated over a hot water bath to a volume of 10 milliliters.

Oil samples are prepared by diluting a known weight of sample in methylene chloride.

Aqueous samples are prepared according to the following procedure:

A known volume of sample is adjusted with 6 M NaOH to pH $\geq$ 11. The sample is extracted three times with pesticide-grade methylene chloride and the extracts combined in a Kuderna-Danish (K-D) apparatus. The sample is then adjusted with 6M HCI to a pH $\leq$ 2 and extracted three more times with methylene chloride. These extracts are combined in a second K-D apparatus. Both sets of extracts are then evaporated over a hot water bath to a final volume of 10 milliliters

Analysis of the above extracts is carried out by capillary column GC/MS/DS in accordance with the following method:

- EPA Method 625, Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, July, 1982.

Detection Limits are reported in accordance with EPA Method 625, Federal Register, December 3, 1979.

S-R ANALYTICAL INC.

Distillation

The samples were distilled with the following fractions collected:

Sample Designation		Fraction Temperatures, °C
10445-1	FAS018	100 295-320
10445-2	FAS019	168-174 180-194
10445-3	FAS020	110-115 220-245 260-263 282 305-325

At the request of Mr. Wayne Howitz of the NJDEP , the Base/Neutral Extractabie Organics analysis was conducted on the highest boiling fraction of each sample.

II. Analytical Results

Base/Neutral Extractable Organics (Method 625 by GC/MS)

Constituent	Blank	10445-1 FAS018	10445-2 FAS019	10445-2 Duplicate	10445-3 FAS020
		Sample Designation			
bis(2-Chloroethyl)ether	<1	<100	<100	<100	<100
1,4-Dichlorobenzene	<1	<100	<100	<100	<100
bis(2-Chloroisopropyl)ether	<1	<100	<100	<100	<100
Nitrobenzene	<1	<100	<100	<100	<100
Acenaphthylene	<1	<100	<100	<100	<100
Dimethyl phthalate	<1	<100	<100	<100	<100
2,6-Dinitrotoluene	<1	<100	<100	<100	<100
4-Bromophenyl phenyl ether	<1	<100	<100	<100	<100
Dibutylphthalate	<1	<100	<100	<100	<100
3,3'-Dichiorobenzidine	<1	<100	<100	<100	<100
bis (2-Ethylhexyl) phthalate	<1	<100	<100	<100	<100
Benzo(b)fluoranthene	<1	<100	<100	<100	<100
N-Nitrosodipropylamine	<1	<100	<100	<100	<100
Hexachloroethane	<1	<100	<100	<100	<100
Isophorone	<1	<100	<100	<100	<100
1,2,4-Trichlorobenzene	<1	<100	<100	<100	<100
Hexachlorocyclopentadiene	<1	<100	<100	<100	<100
2-Chloronapthalene	<1	<100	<100	<100	<100
Azobenzene	<1	<100	<100	<100	<100
N-Nitrosodiphenyl amine	<1	<100	<100	<100	<100
Phenanthrene	<1	<100	<100	<100	<100
Fluoranthene	<1	<100	<100	<100	<100
Butyl benzyl phthalate	<1	<100	<100	<100	<100
N-Nitrosodimethyl amine	<1	<100	<100	<100	<100
4-Chlorophenyl-phenyl ether	<1	<100	<100	<100	<100
Benzidine	<1	<100	<100	<100	<100
Di-n-octyl phthalate	<1	<100	<100	<100	<100
Benzo(k)fluoranthene	<1	<100	<100	<100	<100
Benzo(a)pyrene	<1	<100	<100	<100	<100
Indeno(1,2,3-c,d)pyrene	<1	<100	<100	<100	<100
Benzo(g,h,i)perylene	<1	<100	<100	<100	<100
1,3-Dichlorobenzene	<1	<100	<100	<100	<100
1,2-Dichlorobenzene	<1	<100	<100	<100	<100
bis (2-Chloroethoxy) methane	<1	<100	<100	<100	<100
Naphthalene	<1	<100	<100	<100	<100
Acenaphthene	<1	<100	<100	<100	<100
2,4-Dinitrotoluene	<1	<100	<100	<100	<100
9H-Fluorene	<1	<100	<100	<100	<100
Diethyl phthalate	<1	<100	<100	<100	<100
Hexachlorobenzene	<1	<100	<100	<100	<100
Anthracene	<1	<100	<100	<100	<100
Pyrene	<1	<100	<100	<100	<100
Benzo(a)anthracene	<1	<100	<100	<100	<100
Chrysene	<1	<100	<100	<100	<100
Dibenzo(a,h)anthracene	<1	<100	<100	<100	<100
Hexachlorobutadiene	<1	<100	<100	<100	<100
Units	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)

Note: The chromatograms for the above samples revealed a very complex matrix which may prevent proper identification of the listed compounds. (Att. F, p. 5)

Ref. 16

S-R ANALYTICAL INC.

Base/Neutral Extractabie Organics (Method 625 by GC/MS)

	SR10445-2 Spike	
Constituent	Amount of Spike, ppm	% Recovery
Bis (2-chloroethyl) ether	50	*
1,4-Dichlorobenzene	50	*
Bis (2-chloroisopropyl) ether	50	*
Nitrobenzene	50	*
Acenaphthylene	50	*
Dimethylphthalate	50	*
2,6-Dinitrotoluene	50	*
4-Bromophenylphenyl ether	50	*
Dibutylphthalate	50	*
3,3'-Dichiorobenzidine	50	*
Bis (2-ethylhexyl) phthalate	50	*
Benzo (B) Fluoranthene	50	*

* Sample dilution and complex matrix prevented recovery of spike and duplicate spike.

	Method Detection Limit, ug/l	Precision % RSD	Accuracy, %
Base/Neutral Extractable Organics			
1,2-Dichlorobenzene	5.0	28	62 ± 56
1,3-Dichlorobenzene	5.0	24	54 ± 48
1,4-Dichlorobenzene	5.0	35	63 ± 70
Hexachloroethane	5.0	26	52 ± 52
Hexachlorobutadiene	5.0	28	48 ± 56
Hexachlorobenzene	5.0	22	71 ± 44
1,2,4-Trichlorobenzene	5.0	26	69 ± 52
bis (2-Chloroethoxy) methane	5.0	74	82 ± 148
Naphthalene	5.0	35	77 ± 70
2-Chloronapthalene	5.0	27	79 ± 54
Isophorone	5.0	22	77 ± 44
Nitrobenzene	5.0	54	82 ± 108
2,4-Dinitrotoluene	5.0	34	79 ± 68
2,6-Dinitrotoluene	5.0	25	79 ± 50
4-Bromophenyl phenyl ether	5.0	20	75 ± 40
bis (2-Ethylhexyl) phthalate	5.0	63	82 ± 126
Di-n-octyl phthalate	5.0	32	89 ± 64
Dimethyl phthalate	5.0	36	35 ± 72
Diethyl phthalate	5.0	28	48 ± 56
Di-n-butyl phthalate	5.0	51	93 ± 102
Acenaphthylene	5.0	23	82 ± 46
Acenaphthene	5.0	29	83 ± 58
Butyl benzyl phthalate	5.0	43	74 ± 86
Fluorene	5.0	20	80 ± 40
Fluoranthene	5.0	26	80 ± 52
Chrysene	5.0	13	75 ± 26
Pyrene	5.0	23	80 ± 46
Phenanthracene	5.0	22	76 ± 44
Anthracene	5.0	22	76 ± 44
Benzo(a)anthracene	5.0	28	75 ± 56
Benzo(b)fluoranthene	5.0	21	41 ± 42
Benzo(k)fluoranthene	5.0	27	47 ± 54
Benzo(a)pyrene	5.0	21	43 ± 42
Indeno(1,2,3-c,d)pyrene	5.0	43	81 ± 86
Dibenzo(a,h)anthracene	5.0	40	70 ± 80
Benzo(g,h,i)perylene	5.0	40	68 ± 80
4-Chlorophenyl-phenyl ether	5.0	11	45 ± 22
3,3'-Dichlorobenzidine	5.0	140	143 ± 280
Benzidine	5.0	55	63 ± 110
bis(2-Chloroethyl)ether	5.0	37	72 ± 74
Hexachlorocyclopentadiene	5.0	12	12 ± 24
N-Nitrosodimethyl amine	5.0	18	86 ± 36
N-Nitrosodi-n-propylamine	5.0	45	76 ± 90
bis(2-Chloroisopropyl)ether	5.0	39	71 ± 78

S-R ANALYTICAL INC.

Should the State of New Jersey have any questions concerning this analysis, please don't hesitate to contact me.

Respectfully submitted,

S-R ANALYTICAL, INC.

Ian Lambert

Ian C. Lambert
Laboratory Manager

ICL/pd

Form DEP-011
12/83

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

RECEIPT FOR PROPERTY

UNIT DESIGNATION OF RECEIVING HEADQUARTERS	COMPLAINT OR CASE NR (If any) 20-04-07
LOCATION	
NAME OF PERSON FROM WHOM PROPERTY IS OBTAINED ☐ OWNER ☐ OTHER	ADDRESS (Include ZIP Code)
LOCATION OF PROPERTY	
PURPOSE FOR WHICH OBTAINED	

ITEM NR	QUANTITY	DESCRIPTION OF ARTICLES (Include model, serial Nr, Identifying marks, condition, and value, when appropriate)
1	1	950 ml amber glass bottle labelled FAS018 CONTAINING A Yellow, VISCOUS liquid
2	1	950 ml amber glass bottle labelled FAS019 CONTAINING A DARK LIQUID
3	1	950 ml amber glass bottle labelled FAS020 CONTAINING A yellow, viscous liquid

CHAIN OF CUSTODY

ITEM NR	Date	Time	RELINQUISHED BY	RECEIVED BY	PURPOSE OF CHANGE OF CUSTODY
1 2 3	11/09/84	16:55	TYPED NAME FRED SICKELS SIGNATURE [signature]	TYPED NAME WAYNE HOWITZ SIGNATURE [signature]	TRANSPORT TO LAB.
1, 2, 3	11/9/84	1745	TYPED NAME WAYNE HOWITZ SIGNATURE [signature]	TYPED NAME CHARLES CORRETHAN SIGNATURE [signature]	TRANSFER ITEMS 1, 2 & 3 TO STABLEX REUTTER FOR ANALYSIS
1 2 3	11/11/84	1000	TYPED NAME IAN LAMBERT SIGNATURE [signature]	TYPED NAME Joseph P. McLaughlin SIGNATURE [signature]	analysis
1, 2, 3	11/11/84	1106	TYPED NAME Joseph P. McLaughlin SIGNATURE [signature]	TYPED NAME IAN LAMBERT SIGNATURE [signature]	STORAGE

Ref. 11

(Att. F, p. 9)

CHAIN OF CUSTODY (Continued)

ITEM NO.	DATE	RELINQUISHED BY (Typed Name, Grade and Branch / Signature)	RECEIVED BY (Typed Name, Grade and Branch / Signature)	PURPOSE OF CHANGE OF CUSTODY
3	11/12/84	IAN LAMBERT / [signature]	Howard Whaley / [signature]	analysis
1, 2, 3	11/12/84	Howard Whaley / [signature]	IAN LAMBERT / [signature]	storage
1, 2, 3	11/12/84	IAN LAMBERT / [signature]	JOSEPH H. WALKER / [signature]	analysis
1, 2, 3	11/12/84	JOSEPH H. WALKER / [signature]	IAN LAMBERT / [signature]	storage
1, 2, 3	11/13/84	IAN LAMBERT / [signature]	Maria Stanik / [signature]	RXTivity
1, 2, 3	11/13/84	Maria Stanik / [signature]	IAN LAMBERT / [signature]	STORAGE
3	1/2	IAN LAMBERT / [signature]	Andrea Pague / [signature]	distillation
1 2 3	1/2	Andrea Pague / [signature]	IAN LAMBERT / [signature]	Storage
1-3	2/26	[signature] / IAN LAMBERT	MICHAEL SHMOOKLER / [signature]	inspection
1-3	2/26	MICHAEL SHMOOKLER / [signature]	IAN LAMBERT / [signature]	storage
1-3	2/26	IAN LAMBERT / [signature]	Patti Twaddell / [signature]	distillation
1-3	2/26	Patti Twaddell / [signature]	IAN LAMBERT / [signature]	storage

Ref. 16

Stablex-Reutter Inc.

LABORATORY NOTEBOOK ACCOUNTABILITY RECORD

ANALYSIS	SAMPLE NO. (S-R)	OSW DESIGNATION	NOTEBOOK NUMBER	PAGE(S)	DATE	ANALYST
DISTILLATION	10445-1,2,3	FA5018,019,020	1323	89,95,97	2/26 2/27	PT
BASE/NEUTRAL PREP	"	"	GC/MS	-	2/28	WAF
BASE/NEUTRAL ANALYSIS	"	"	GC/MS	-	2/28	WAF

Att. F, p.11

Ref. 16

IID Mass List Data: DFTPPA228 # 597 Base m/z: 198
02/28/85 7:57:00 + 8:25 Cali: DFTPPA228 # 2 C: 9306110.
Sample: DFTPP-A 2/28/85
Conds.: EI

5 0.00 Minima Min inten: 3088.
4 # 0 Maxima

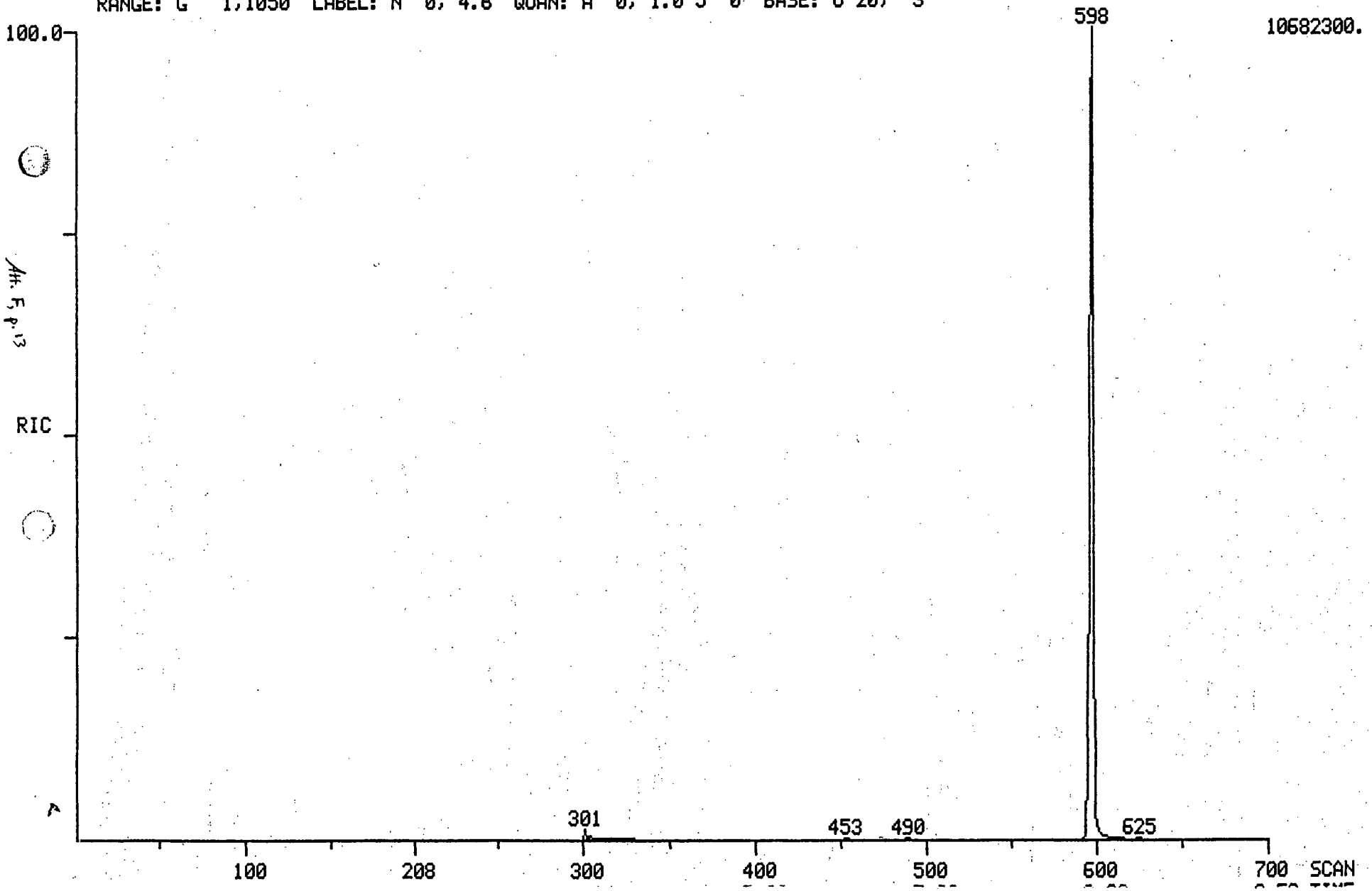
Mass	% RA	Mass	% RA	Mass	% RA	Mass	% RA
49	0.57	122	0.63	187	3.09	257	0.51
50	11.44	123	1.09	188	0.40	258	2.01
51	43.31	124	0.51	189	0.55	259	0.33
52	2.29	125	0.61	191	0.39	265	0.80
56	1.29	127	40.42	192	0.87	271	0.52
57	2.98	128	3.08	193	0.98	272	0.31
61	0.46	129	15.72	194	0.28	273	1.45
62	0.50	130	1.33	195	0.27	274	4.25
63	1.56	131	0.28	196	2.89	275	21.81
64	0.30	134	0.39	198	100.00	276	2.75
65	0.81	135	1.34	199	6.63	277	1.50
69	46.51	136	0.56	200	0.51	278	0.32
70	0.28	137	0.68	202	0.80	285	0.32
73	0.34	140	0.27	203	0.54	293	0.45
74	3.35	141	1.68	204	2.67	296	4.61
75	5.75	142	0.72	205	4.51	297	0.61
76	2.17	143	0.51	206	18.63	303	0.66
77	40.08	146	0.36	207	2.73	314	0.30
78	2.69	147	1.00	208	0.67	315	0.60
79	2.17	148	1.83	209	0.30	316	0.38
80	1.76	149	0.42	210	0.34	321	0.27
81	2.83	151	0.68	211	1.21	323	1.88
82	0.75	153	0.61	215	0.31	324	0.39
83	0.72	154	0.52	216	0.48	327	0.33
84	0.28	155	0.98	217	4.79	333	0.28
85	0.42	156	1.62	218	0.60	334	1.17
86	0.72	157	0.43	221	6.51	335	0.37
87	0.37	158	0.38	223	1.24	341	0.29
88	0.26	159	0.34	224	10.04	346	0.40
91	0.56	160	0.61	225	2.60	352	0.61
92	0.63	161	0.95	226	0.39	353	0.48
93	3.59	162	0.33	227	3.75	354	0.70
94	0.32	165	0.60	228	0.56	365	2.55
96	0.29	166	0.69	229	0.86	366	0.37
98	2.41	167	3.67	231	0.39	371	0.26
99	2.27	168	1.70	234	0.32	372	1.19
100	0.34	169	0.33	235	0.38	373	0.29
101	1.58	171	0.26	236	0.30	383	0.34
103	0.42	172	0.34	237	0.36	402	0.57
104	0.88	173	0.48	241	0.36	403	0.66
105	0.85	174	0.80	242	0.56	404	0.32
106	0.41	175	1.39	243	0.64	421	0.63
107	11.01	176	0.56	244	8.45	422	0.64
108	1.76	177	0.72	245	1.21	423	5.07
109	0.40	178	0.30	246	1.34	424	0.93
110	23.59	179	2.62	247	0.32	438	0.31
111	3.44	180	1.90	249	0.36	439	0.28
112	0.45	181	0.98	252	0.36	441	11.05
116	0.74	184	0.33	253	0.44	442	79.13
117	6.30	185	1.43	255	40.29	443	14.44
118	0.55	186	10.66	256	5.71	444	1.42

Ref 16

Rev. 16

NIDRIC
02/28/85 7:57:00
SAMPLE: DFTPP-A 2/28/85
CONDS.: EI
RANGE: G 1,1050 LABEL: N 0, 4.6 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: DFTPPA223 #537 SCANS 1 TO 700
CALI: DFTPPA228 #2



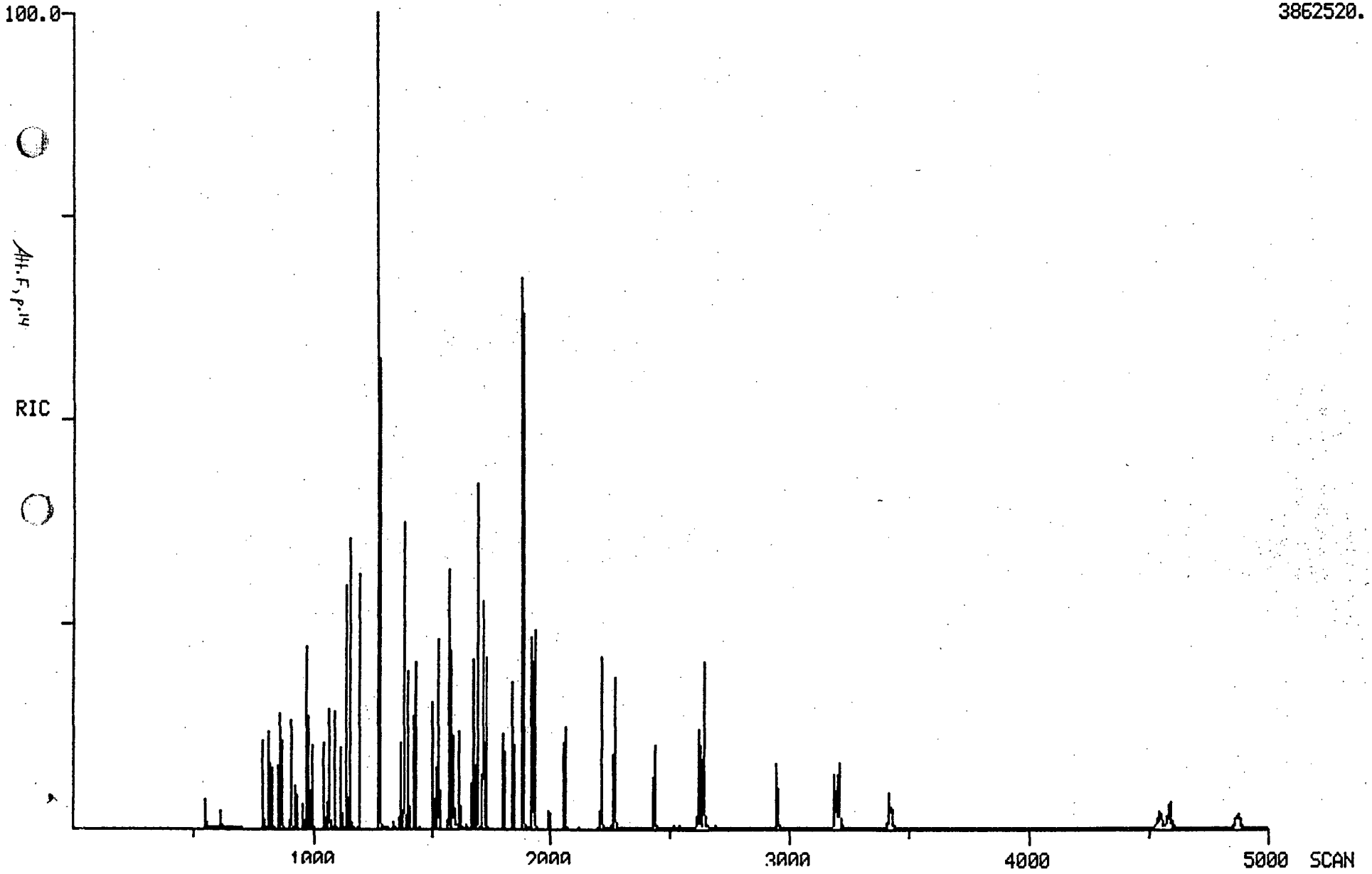
Att. F, p. 13

Ref. 16

MIDRIC
02/28/85 8:27:00
SAMPLE: AE/BN STANDARD 2/28/85
CONDS.: EI 40 NG.
RANGE: G 1,5000 LABEL: N 0, 4.8 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: ABSTD228 #1
CALI: ABSTD228 #2

SCANS 1 TO 5008



Att. F, p. 14

Quantitation Report File: ABSTD228

Data: ABSTD228.TI
02/28/85 8:27:00
Sample: AE/BN STANDARD 2/28/85
Submitted by: SR Analyst: WAF

AMOUNT=AREA * REF.AMNT/(REF.AREA)* RESP.FACT)
Resp. fac. from Library Entry

NO	NAME
1	DIO-ANTHRACENE (I.S.)
2	2-FLUOROPHENOL (SURROGATE)
3	D5-PHENOL (SURROGATE)
4	2-FLUOROBIPHENYL (SURROGATE)
5	D5-NITROBENZENE (SURROGATE)

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount		%Tot
1	188	1934	27:17	1	1.000	A BB	996507.	40.000	NG/ML	17.47
2	112	615	8:41	1	0.318	A BV	51520.	63.811	NG/UL	27.87
3	99	790	11:09	1	0.408	A BB	64800.	82.073	NG/UL	35.84
4	172	1404	19:48	1	0.726	A BB	497472.	22.701	NG/UL	9.91
5	82	988	13:56	1	0.511	A BV	154592.	20.414	NG/UL	8.91

AH F., p.15

Ref. 16

TCA FINISHED, 5 FOUND
FINISHED AT: 2/28/85 9:49:[illegible]
Quantitation Report File: ABSTD228

Data: ABSTD228.TI
D2[illegible]/85 8:27:00
Sample: AE/BN STANDARD 2/28/85
Submitted by: SR Analyst: WAF

AMOUNT=AREA * REF.AMNT/(REF.AREA)* RESP.FACT)
Resp. fac. from Library Entry

NO	NAME
1	DIO-ANTHRACENE (I.S.)
2	2-FLUOROPHENOL (SURROGATE)
3	D5-PHENOL (SURROGATE)
4	2-FLUOROBIPHENYL (SURROGATE)
5	D5-NITROBENZENE (SURROGATE)

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount		%Tat
1	188	1934	27:17	1	1.000	A BB	996507.	40.000	NG/ML	16.67
2	112	615	8:41	1	0.318	A BV	51520.	80.000	NG/UL	33.33
3	99	790	11:09	1	0.408	A BB	64800.	80.000	NG/UL	33.33
4	172	1404	19:48	1	0.726	A BB	497472.	20.000	NG/UL	8.33
5	82	988	13:56	1	0.511	A BV	154592.	20.000	NG/UL	8.33

Ref. 16

AH.F, p. 16

Quantitation Report File: ABSTD228

Data: ABSTD228.TI
02/28/85 8:27:00
Sample: AE/BN STANDARD 2/28/85
Submitted by: SR Analyst: WAF

AMOUNT=AREA * REF.AMNT/(REF.AREA)* RESP.FACT)
Resp. fac. from Library Entry

NO	NAME
1	DIO-ANTHRACENE (I.S.)
2	PHENOL
3	2-CHLOROPHENOL
4	2-NITROPHENOL
5	2,4-DIMETHYLPHENOL
6	2,4-DICHLOROPHENOL
7	4-CHLORO-3-METHYL PHENOL
8	2,4,6-TRICHLOROPHENOL
9	2,4-DINITROPHENOL
10	4-NITROPHENOL
11	2-METHYL-4,6-DINITROPHENOL
12	PENTACHLOROPHENOL
13	2-FLUOROPHENOL(SURROGATE)
14	D5-PHENOL (SURROGATE)

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount		%Tot
1	188	1934	27:17	1	1.000	A BB	996507.	40.000	NG/ML	2.86
2	94	792	11:10	1	0.410	A BV	372788.	44.473	NG	3.18
3	128	826	11:39	1	0.427	A BV	405232.	42.657	NG	3.05
4	139	1066	15:02	1	0.551	A BV	178144.	44.284	NG	3.17
5	122	1069	15:05	1	0.553	A BV	271072.	44.394	NG	3.18
6	162	1115	15:44	1	0.577	A BB	346808.	47.594	NG	3.41
7	142	1278	18:02	1	0.661	A BB	1367020.	213.338	NG	15.27
8	196	1385	19:32	1	0.716	A BB	776544.	126.034	NG	9.02
9	63	1582	22:19	1	0.818	A VV	122650.	108.682	NG	7.78
10	65	1594	22:29	1	0.824	A BV	195264.	144.432	NG	10.34
11	198	1718	24:14	1	0.888	A BV	731309.	203.365	NG	14.56
12	266	1889	26:39	1	0.977	A BB	786536.	191.700	NG	13.72
13	112	615	8:41	1	0.318	A BV	51520.	63.811	NG	4.57
14	99	790	11:09	1	0.408	A BB	64800.	82.073	NG	5.88

Ref. 16

TCA FINISHED, 14 FOUND
FINISHED AT: 2/28/85 10:01:2
Quantitation Report File: ABSTD228

Data: ABSTD228.TI
D[illegible]/85 8:27:00
Sample: AE/BN STANDARD 2/28/85
Submitted by: SR Analyst: WAF

AMOUNT=AREA * REF.AMNT/(REF.AREA)* RESP.FACT)
Resp. fac. from Library Entry

NO	NAME
1	DIO-ANTHRACENE (I.S.)
2	PHENOL
3	2-CHLOROPHENOL
4	2-NITROPHENOL
5	2,4-DIMETHYLPHENOL
6	2,4-DICHLOROPHENOL
7	4-CHLORO-3-METHYL PHENOL
8	2,4,6-TRICHLOROPHENOL
9	2,4-DINITROPHENOL
10	4-NITROPHENOL
11	2-METHYL-4,6-DINITROPHENOL
12	PENTACHLOROPHENOL
13	2-FLUOROPHENOL(SURROGATE)
14	D5-PHENOL (SURROGATE)

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount		%Tot
1	188	1934	27:17	1	1.000	A BB	996507.	40.000	NG/ML	2.78
[illegible]	94	792	11:10	1	0.410	A BV	372788.	40.000	NG	2.78
[illegible]	128	826	11:39	1	0.427	A BV	405232.	40.000	NG	2.78
4	139	1066	15:02	1	0.551	A BV	178144.	40.000	NG	2.78
5	122	1069	15:05	1	0.553	A BV	271072.	40.000	NG	2.78
6	162	1115	15:44	1	0.577	A BB	346808.	40.000	NG	2.78
7	142	1278	18:02	1	0.661	A BB	1367020.	200.000	NG	13.89
8	196	1385	19:32	1	0.716	A BB	776544.	120.000	NG	8.33
9	63	1582	22:19	1	0.818	A VV	122650.	120.000	NG	8.33
10	65	1594	22:29	1	0.824	A BV	195264.	200.000	NG	13.89
11	198	1718	24:14	1	0.888	A BV	731309.	200.000	NG	13.89
12	266	1889	26:39	1	0.977	A BB	786536.	200.000	NG	13.89
13	112	615	8:41	I	0.318	A BV	51520.	80.000	NG	5.56
14	99	790	11:09	1	0.408	A BB	64800.	80.000	NG	5.56

Ref. 10

Att. F, p.18

TCA FINISHED, 49 FOUND
FINISHED AT: 2/28/85 11:55:
Quantitation Report File: ABSTD22B

Data: ABSTD22B.TI
2/28/85 8:27:00
Sample: AE/BN STANDARD 2/28/85
Submitted by: SR Analyst: WAF

AMOUNT=AREA * REF.AMNT/(REF.AREA)* RESP.FACT)
Resp. fac. from Library Entry

NO	NAME
1	DIO-ANTHRACENE (I.S.)
2	BIS(2-CHLOROETHYL) ETHER
3	1,4-DICHLOROBENZENE
4	BIS(2-CHLOROISOPROPYL)ETHER
5	BENZENE, NITRO (NITROBENZENE)
6	ACENAPHTHYLENE
7	DIMETHYL PHTHALATE
8	2,6-DINITROTOLUENE
9	4-BROMOPHENYLPHENYL ETHER
10	DIBUTYL PHTHALATE
11	3,3'-DICHLOROBENZIDINE
12	BIS(2-ETHYLHEXYL) PHTHALATE
13	BENZO(B)FLUORANTHENE
14	D5-NITROBENZENE (SURROGATE)
15	N-NITROSODI-N-PROPYL AMINE
16	ETHANE, HEXACHLORO (HEXACHLOROETHANE)
17	ISOPHORONE
[illegible]	1,2,4-TRICHLOROBENZENE
[illegible]	HEXACHLOROCYCLOPENTADIENE
20	2-CHLORONAPHTHALENE
21	AZOBENZENE
22	N-NITROSODIPHENYL AMINE
23	PHENANTHRENE
24	FLUORANTHENE
25	BUTYLBENZYL PHTHALATE
26	N-NITROSODIMETHYL AMINE
27	4-CHLOROPHENYLPHENYL ETHER
28	BENZIDINE
29	DI-N-OCTYL PHTHALATE
30	BENZO(K)FLUORANTHENE
31	BENZO(A)PYRENE
32	INDENO(1,2,3-C,D)PYRENE
33	BENZO(GHI)PERYLENE
34	2-FLUOROBIPHENYL (SURROGATE)
35	BENZENE, 1,3-DICHLORO (1,3-DICHLOROBENZENE)
36	BENZENE, 1,2-DICHLORO (1,2-DICHLOROBENZENE)
37	BIS(2-CHLOROETHOXY)METHANE
38	NAPHTHALENE
39	ACENAPHTHYLENE, 1,2-DIHYDRO (ACENAPHTHALENE)
40	2,4-DINITROTOLUENE
41	9H-FLUORENE
42	DIETHYL PHTHALATE
43	BENZENE, HEXACHLORO (HEXACHLOROBENZENE)
[illegible]	ANTHRACENE
[illegible]	PYRENE
46	BENZO(A)ANTHRACENE
47	CHRYSENE
48	DIBENZO(A,H)ANTHRACENE
49	1,3-BUTADIENE,1,1,2,3,4,4-HEXACHLORO

Att. F, p.19

D.S 16

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount		%Tot
1	188	1934	27:17	1	1.000	A BB	996507.	40.000	NG/ML	2.08
2	93	1093	15:25	1	0.565	A BV	467300.	40.000	NG	2.08
3	146	859	12:07	1	0.444	A BV	548704.	40.000	NG	2.08
[illegible]	45	929	13:06	1	0.480	A BB	143936.	40.000	NG	2.08
[illegible]	77	995	14:02	1	0.514	A BV	334560.	40.000	NG	2.08
6	152	1530	21:35	1	0.791	A BB	1232090.	40.000	NG	2.08
7	163	1506	21:15	1	0.779	A BB	844050.	40.000	NG	2.08
8	165	1524	21:30	1	0.788	A BB	187104.	40.000	NG	2.08
9	248	1809	25:31	1	0.935	A BB	256704.	40.000	NG	2.08
10	149	2065	29:08	1	1.068	A BB	1146780.	40.000	NG	2.08
11	252	2619	36:57	1	1.354	A VV	57682.	40.000	NG	2.08
12	149	2645	37:19	1	1.368	A BB	531469.	40.000	NG	2.08
13	253	3419	48:14	1	1.768	A BV	78373.	40.000	NG	2.08
14	82	988	13:56	1	0.511	A BV	154592.	20.000	NG	1.04
15	130	960	13:32	1	0.496	A BB	57056.	40.000	NG	2.08
16	117	977	13:47	1	0.505	A BB	236416.	40.000	NG	2.08
17	82	1044	14:44	1	0.540	A BB	674330.	40.000	NG	2.08
18	180	1139	16:04	1	0.589	A BV	512096.	40.000	NG	2.08
19	237	1368	19:18	1	0.707	A BB	160800.	40.000	NG	2.08
20	162	1431	20:11	1	0.740	A BV	812896.	40.000	NG	2.08
21	77	1718	24:14	1	0.888	A BV	189914.	40.000	NG	2.08
22	169	1722	24:17	1	0.890	A BB	403163.	40.000	NG	2.08
23	178	1938	27:20	1	1.002	A VB	1125000.	40.000	NG	2.08
24	202	2272	32:03	1	1.175	A BB	1249890.	40.000	NG	2.08
25	149	2439	34:24	1	1.261	A BV	364057.	40.000	NG	2.08
26	74	1890	26:40	1	0.977	A BB	7776.	40.000	NG	2.08
27	204	1889	26:39	1	0.977	A BV	122560.	40.000	NG	2.08
28	184	1934	27:17	1	1.000	A BB	149760.	40.000	NG	2.08
29	149	2065	29:08	1	1.068	A BB	1146780.	40.000	NG	2.08
[illegible]	252	3188	44:58	1	1.648	A BV	460564.	40.000	NG	2.08
31	252	3207	45:14	1	1.658	A VB	699112.	40.000	NG	2.08
32	276	4874	68:45	1	2.520	A BB	278680.	40.000	NG	2.08
33	276	4874	68:45	1	2.520	A BB	278680.	40.000	NG	2.08
34	172	1404	19:48	1	0.726	A BB	497472.	20.000	NG	1.04
35	146	909	12:49	1	0.470	A BV	515840.	40.000	NG	2.08
36	146	868	12:15	1	0.449	A VV	590176.	40.000	NG	2.08
37	93	1093	15:25	1	0.565	A BV	467300.	40.000	NG	2.08
38	128	1153	16:16	1	0.596	A VV	1398810.	40.000	NG	2.08
39	153	1576	22:14	1	0.815	A BB	804992.	40.000	NG	2.08
40	165	1618	22:49	1	0.837	A BB	268288.	40.000	NG	2.08
41	166	1695	23:55	1	0.876	A BB	905280.	40.000	NG	2.08
42	149	1677	23:39	1	0.867	A BV	883134.	40.000	NG	2.08
43	284	1848	26:04	1	0.956	A BB	328960.	40.000	NG	2.08
44	178	1927	27:11	1	0.996	A BV	1170910.	40.000	NG	2.08
45	202	2218	31:17	1	1.147	A BB	1202200.	40.000	NG	2.08
46	228	2626	37:02	1	1.358	A BV	852752.	40.000	NG	2.08
47	228	2647	37:20	1	1.369	A VB	881462.	40.000	NG	2.08
48	279	4588	64:43	1	2.372	A VV	59044.	40.000	NG	2.08
49	225	1194	16:51	1	0.617	A BB	319776.	40.000	NG	2.08

Ref. 11

Quantitation Report File: ABSTD228

Data: ABSTD228.TI
02/28/85 8:27:00
Sample: AE/BN STANDARD 2/28/85
Submitted by: SR Analyst: WAF

AMOUNT=AREA * REF.AMNT/(REF.AREA)* RESP.FACT)
Resp. fac. from Library Entry

NO	NAME
1	DIO-ANTHRACENE (I.S.)
2	BIS(2-CHLOROETHYL) ETHER
3	1,4-DICHLOROBENZENE
4	BIS(2-CHLOROISOPROPYL)ETHER
5	BENZENE, NITRO (NITROBENZENE)
6	ACENAPHTHYLENE
7	DIMETHYL PHTHALATE
8	2,6-DINITROTOLUENE
9	4-BROMOPHENYLPHENYL ETHER
10	DIBUTYL PHTHALATE
11	3,3'-DICHLOROBENZIDINE
12	BIS(2-ETHYLHEXYL) PHTHALATE
13	BENZO(B)FLUORANTHENE
14	D5-NITROBENZENE (SURROGATE)
15	N-NITROSODI-N-PROPYL AMINE
16	ETHANE, HEXACHLORO (HEXACHLOROETHANE)
17	ISOPHORONE
18	1,2,4-TRICHLOROBENZENE
19	HEXACHLOROCYCLOPENTADIENE
[illegible]	2-CHLORONAPHTHALENE
[illegible]	AZOBENZENE
22	N-NITROSODIPHENYL AMINE
23	PHENANTHRENE
24	FLUORANTHENE
25	BUTYLBENZYL PHTHALATE
26	N-NITROSODIMETHYL AMINE
27	4-CHLOROPHENYLPHENYL ETHER
28	BENZIDINE
29	DI-N-OCTYL PHTHALATE
30	BENZO(K)FLUORANTHENE
31	BENZO(A)PYRENE
32	INDENO(1,2,3-C,D)PYRENE
33	BENZO(GHI)PERYLENE
34	2-FLUOROBIPHENYL (SURROGATE)
35	BENZENE, 1,3-DICHLORO (1,3-DICHLOROBENZENE)
36	BENZENE, 1,2-DICHLORO (1,2-DICHLOROBENZENE)
37	BIS(2-CHLOROETHOXY)METHANE
38	NAPHTHALENE
39	ACENAPHTHYLENE, 1,2-DIHYDRO (ACENAPHTHALENE)
40	2,4-DINITROTOLUENE
41	9H-FLUORENE
42	DIETHYL PHTHALATE
43	BENZENE, HEXACHLORO (HEXACHLOROBENZENE)
44	ANTHRACENE
45	PYRENE
[illegible]	BENZO(A)ANTHRACENE
[illegible]	CHRYSENE
48	DIBENZO(A,H)ANTHRACENE
49	1,3-BUTADIENE,1,1,2,3,4,4-HEXACHLORO

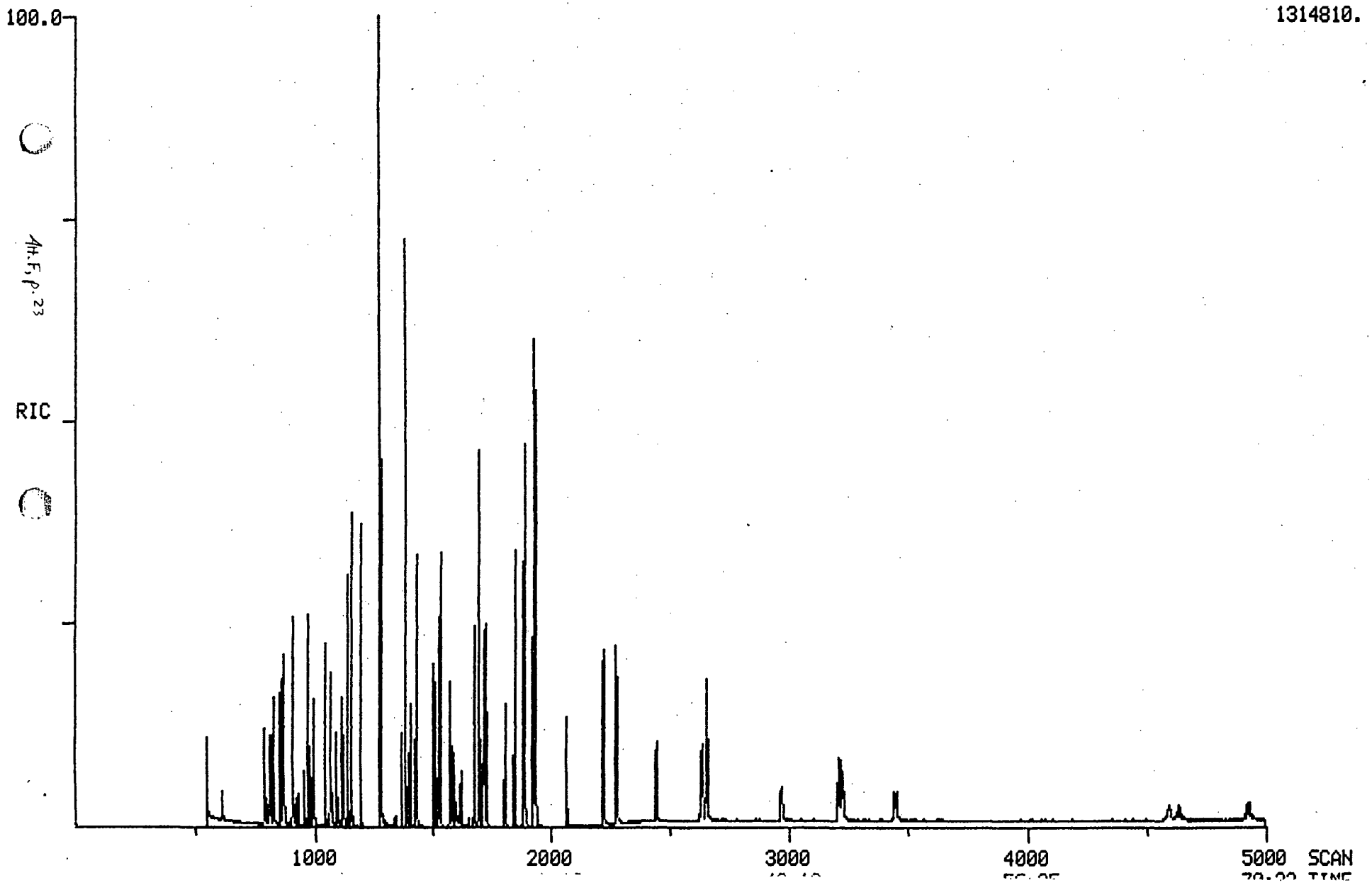
No	m/z	Scan	Time	Ref	RT	Meth	Area(Hght)	Amount		%Tot
1	188	1934	27:17	1	1.000	A BB	996507.	40.000	NG/ML	1.98
2	93	1093	15:25	1	0.565	A BV	467300.	43.772	NG	2.16
3	146	859	12:07	1	0.444	A BV	548704.	43.466	NG	2.15
[illegible]	45	929	13:06	1	0.480	A BB	143936.	28.026	NG	1.39
[illegible]	77	995	14:02	1	0.514	A BV	334560.	40.677	NG	2.01
6	152	1530	21:35	1	0.791	A BB	1232090.	43.714	NG	2.16
7	163	1506	21:15	1	0.779	A BB	844050.	40.975	NG	2.03
8	165	1524	21:30	1	0.788	A BB	187104.	43.250	NG	2.14
9	248	1809	25:31	1	0.935	A BB	256704.	40.853	NG	2.02
10	149	2065	29:08	1	1.068	A BB	1146780.	36.944	NG	1.83
11	252	2619	36:57	1	1.354	A VV	57682.	20.322	NG	1.00
12	149	2645	37:19	1	1.368	A BB	531469.	36.016	NG	1.78
13	253	3419	48:14	1	1.768	A BV	78373.	23.892	NG	1.18
14	82	988	13:56	1	0.511	A BV	154592.	20.414	NG	1.01
15	130	960	13:32	1	0.496	A BB	57056.	39.539	NG	1.95
16	117	977	13:47	1	0.505	A BB	236416.	42.799	NG	2.12
17	82	1044	14:44	1	0.540	A BB	674330.	40.166	NG	1.99
18	180	1139	16:04	1	0.589	A BV	512096.	44.317	NG	2.19
19	237	1368	19:18	1	0.707	A BB	160800.	48.000	NG	2.37
20	162	1431	20:11	1	0.740	A BV	812896.	42.783	NG	2.11
21	77	1718	24:14	1	0.888	A BV	189914.	45.077	NG	2.23
22	169	1722	24:17	1	0.890	A BB	403163.	40.023	NG	1.98
23	178	1938	27:20	1	1.002	A VB	1125000.	38.189	NG	1.89
24	202	2272	32:03	1	1.175	A BB	1249890.	38.375	NG	1.90
25	149	2439	34:24	1	1.261	A BV	364057.	36.558	NG	1.81
26	74	1890	26:40	1	0.977	A BB	7776.	12.422	NG	0.61
27	204	1889	26:39	1	0.977	A BV	122560.	40.189	NG	1.99
28	184	1934	27:17	1	1.000	A BB	149760.	41.253	NG	2.04
[illegible]	149	2065	29:08	1	1.068	A BB	1146780.	36.944	NG	1.83
[illegible]	252	3188	44:58	1	1.648	A BV	460564.	25.454	NG	1.26
31	252	3207	45:14	1	1.658	A VB	699112.	32.544	NG	1.61
32	276	4874	68:45	1	2.520	A BB	278680.	186.295	NG	9.21
33	276	4874	68:45	1	2.520	A BB	278680.	47.727	NG	2.36
34	172	1404	19:48	1	0.726	A BB	497472.	22.701	NG	1.12
35	146	909	12:49	1	0.470	A BV	515840.	43.870	NG	2.17
36	146	868	12:15	1	0.449	A VV	590176.	44.658	NG	2.21
37	93	1093	15:25	1	0.565	A BV	467300.	43.772	NG	2.16
38	128	1153	16:16	1	0.596	A VV	1398810.	45.405	NG	2.24
39	153	1576	22:14	1	0.815	A BB	804992.	43.409	NG	2.15
40	165	1618	22:49	1	0.837	A BB	268288.	42.681	NG	2.11
41	166	1695	23:55	1	0.876	A BB	905280.	42.859	NG	2.12
42	149	1677	23:39	1	0.867	A BV	883134.	39.676	NG	1.96
43	284	1848	26:04	1	0.956	A BB	328960.	39.419	NG	1.95
44	178	1927	27:11	1	0.996	A BV	1170910.	39.747	NG	1.96
45	202	2218	31:17	1	1.147	A BB	1202200.	38.120	NG	1.88
46	228	2626	37:02	1	1.358	A BV	852752.	34.383	NG	1.70
47	228	2647	37:20	1	1.369	A VB	881462.	35.540	NG	1.76
48	279	4588	64:43	1	2.372	A VV	59044.	43.204	NG	2.14
49	225	1194	16:51	1	0.617	A BB	319776.	42.536	NG	2.10

Ref. 11

Ref. 16

MIDRIC
02/28/85 20:26:00
SAMPLE:
CONDS.:
RANGE: G 1,5000 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: ABSTD20223 #1 SCANS 1 TO 5000
CALI: ABSTD20228 #2

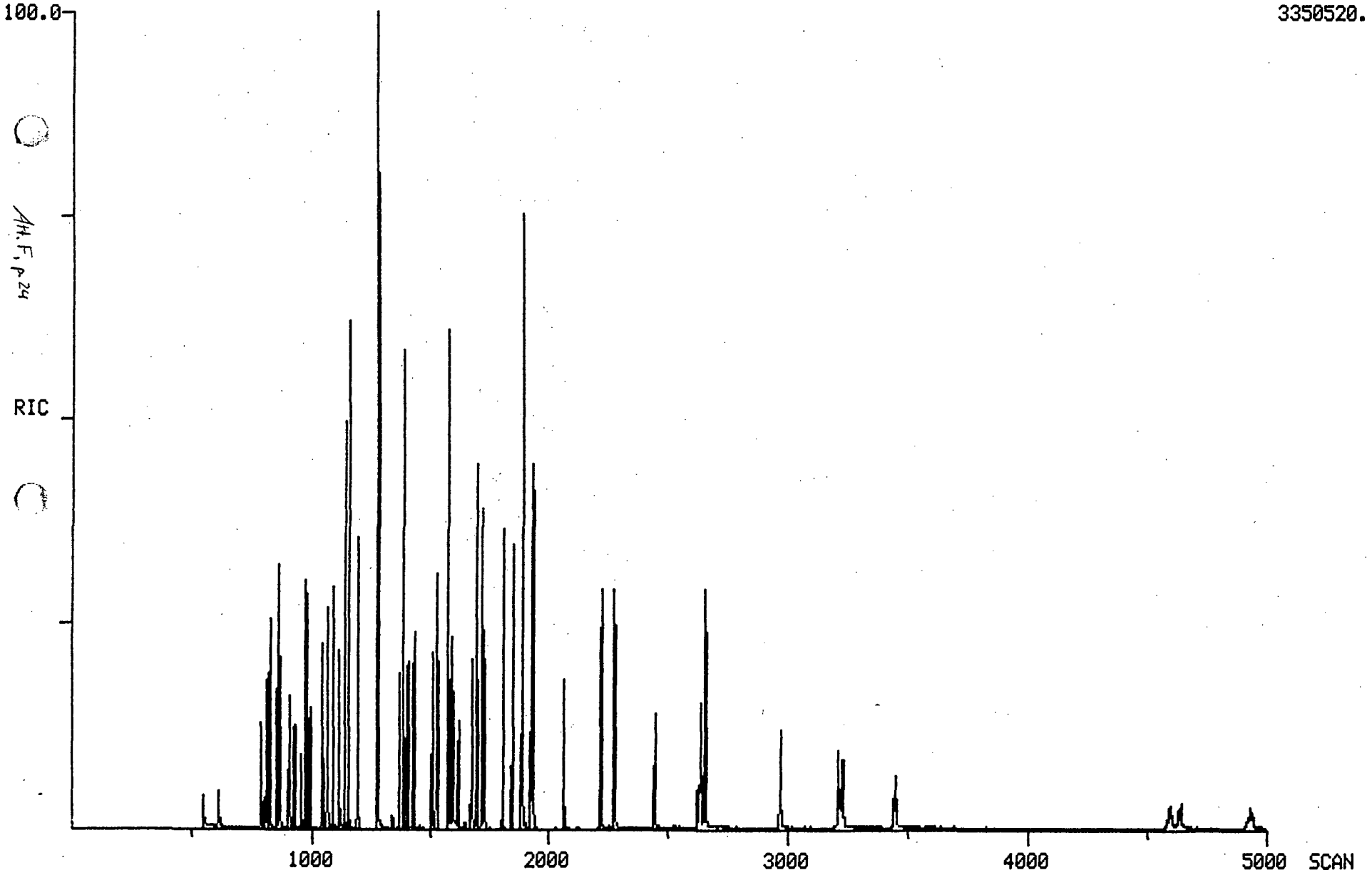


Att. F, p. 23

R.C.16

MIDRIC
02/28/85 22:03:00
SAMPLE:
CONDS.:
RANGE: G 1,5000 LABEL: N 0, 4.0 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: ABSTD60228 #1 SCANS 1 TO 5000
CALI: ABSTD60228 #2



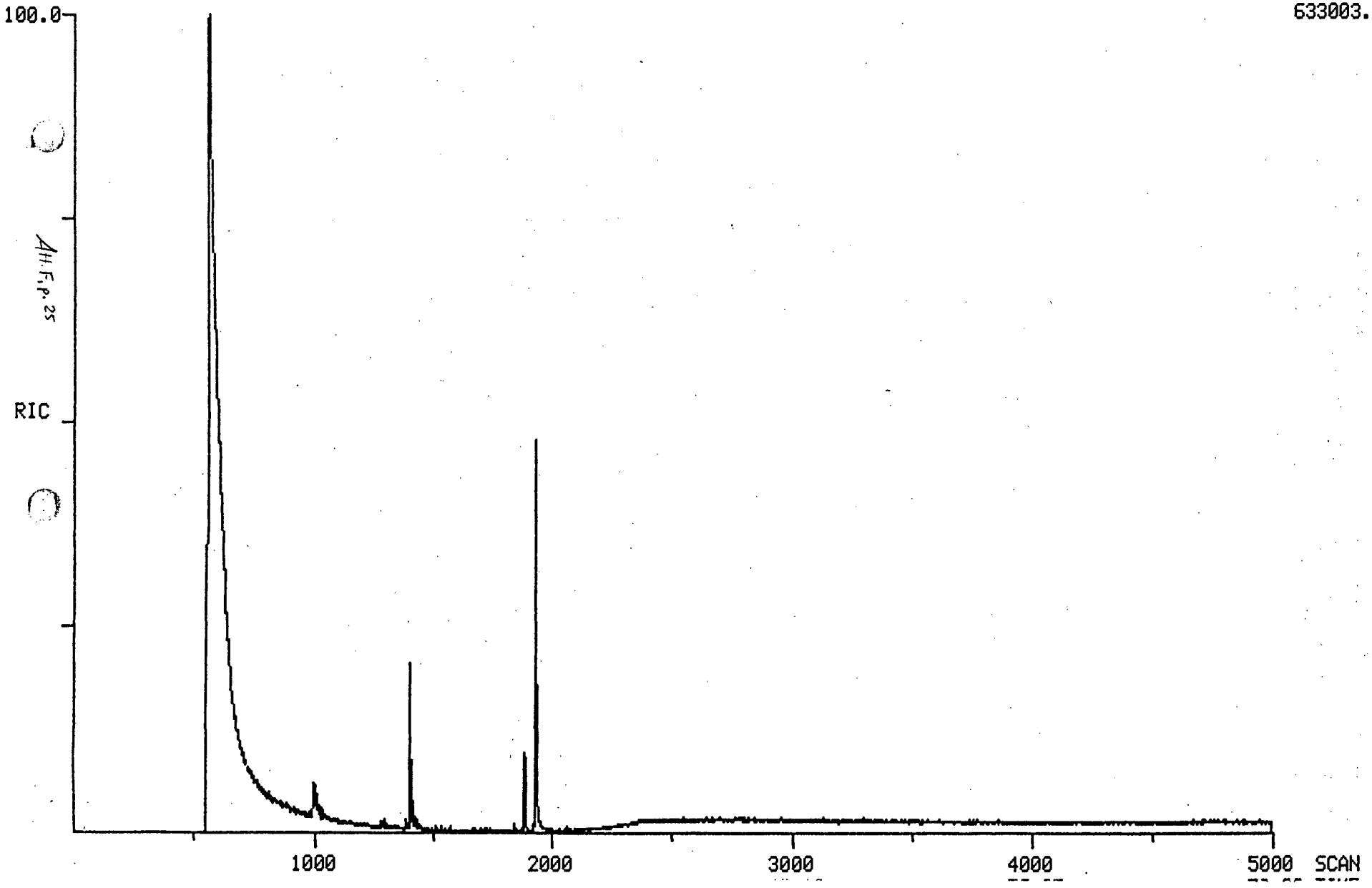
Att. F, p 24

R.L.16

MIDRIC
02/28/85 10:24:00
SAMPLE: 10445 BLANK BN
CONDS.: EI
RANGE: G 1,1028 LABEL: N 0, 4.8 QUAN: A 0, 1.0 J 0 BASE: U 20, 3

DATA: 10445BBN #1
CALI: 10445BBN #2

SCANS 1 TO 5000



AH.F.p.25

Quantitation Report File: 10445BBN

Data: 10445BBN.TI
02/28/85 10:24:00
Sample: 10445 BLANK BN
Submitted by: DWM Analyst: WAF

AMOUNT=AREA * REF.AMNT/(REF.AREA)* RESP.FACT)
Resp. fac. from Library Entry

NO	NAME
1	DIO-ANTHRACENE (I.S.)
2	2-FLUOROPHENOL (SURROGATE)
3	D5-PHENOL (SURROGATE)
4	2-FLUOROBIPHENYL (SURROGATE)
5	D5-NITROBENZENE (SURROGATE)

No	m/z	Scan	Time	Ref	RRT	Meth	Area(Hght)	Amount		%Tot
1	188	1935	27:18	1	1.000	A BV	574992.	40.000	NG/ML	80.44
2	112	620	8:45	1	0.320	A BB	1120.	3.014	NG/UL	6.06
3	NOT FOUND									
4	NOT FOUND									
5	82	994	14:01	1	0.514	A BV	29947.	6.715	NG/UL	13.50

Ref. 16

Att. F, p. 26

REFERENCE NO. 17

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — PROJECT NOTES

TO: Borne Chemical file

DATE: 03/05/97 (Revised: 05/03/97) (Page 1)

FROM: K. Campbell

SUBJECT: Groundwater & Surface Water Use

REFERENCE

The majority of the surrounding communities obtain water from Elizabethtown Water Company, which has water supply sources greater than four miles from the site (Att. O). Groundwater and surface water is not known to be used for drinking water supply within four miles of the site. The following list presents a summary of the surrounding cities and their respective water supply information:

City/Town	Drinking Water Source	Comments
Elizabeth	Elizabethtown Water Co. (60%), and City of Newark (40%)	No known private drinking water wells; private wells may be used for activities such as lawn watering and car washing (Atts. A, B, O).
Roselle Park	Elizabethtown Water Co.	No known private drinking water wells (Atts. C, O).
Roselle	Elizabethtown Water Co.	No known private drinking water wells (Atts. D, O).
Union	Elizabethtown Water Co.	No known private drinking water wells (Atts. E, O).
Newark	Pequannock Watershed (W. Milford Twp., Passaic County) and Wanaque Reservoir (Ringwood, Passaic County).	No known private drinking water wells (Att. F). Sources greater than four miles from the site.
Bayonne	North Jersey District Water Supply Commission (Wanaque Reservoir and Monksville Reservoir).	No known private drinking water wells (Att. G). Sources greater than four miles from the site.
Carteret	Middlesex Water Co. (85% from Del. and Raritan Canal intake and 15% from wells in N. Plainfield and Edison).	No known private drinking water wells (Atts. H, I).
Linden	Elizabethtown Water Co.	No known private drinking water wells (Atts. J, O).

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Borne Chemical file

DATE: 03/05/97 (Revised: 05/03/97) (Page 2)

FROM: K. Campbell KC

SUBJECT: Groundwater & Surface Water Use

REFERENCE

City/Town	Drinking Water Source	Comments
Rahway	Rahway Water Dept. (96% from	No known private drinking water wells (Att. K).
	Intake on Rahway River and 4%	Sources are greater than four miles from the site;
	one Rahway well).	the Rahway well is currently inactive (An. N).
Hillside	Elizabethtown Water Co.	No known private drinking water wells (Atts. L, O).
Staten Is., NY	Catskill/ Delaware System	(Att. M).
	(Upstate New York).	

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — **TELECON NOTE**

CONTROL NO: 02-9603-0020 **DATE:** 06/05/96 **TIME:** 1040

DISTRIBUTION:

Borne Chemical file

BETWEEN: Raymond Zwaryez **OF:** Elizabeth Water Engineering Dept. **PHONE:** (908) 820-4265

AND

K. Campbell

DISCUSSION

The City of Elizabeth receives its drinking water supply from:

- Elizabethtown Water Company (approx. 60%), and
- City of Newark (approx. 40%).

Mr. Zwaryez is not aware of any private drinking water wells; he indicated that there may be private wells utilized for purposes such as car-washing/lawn-watering. He suggested calling the City Health Department for further private well information.

ACTION ITEMS:

K. Campbell 06/05/96

Ref. 17

Att. A, p.1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: 02-96-03-0020 **DATE:** 6/7/96 **TIME:** 1100

DISTRIBUTION:
Borne Chemical file

BETWEEN: KEN SANDOR **OF:** ELIZABETH HEALTH DEPARTMENT **PHONE:** (908) 820-4060

AND
SWAMY KETHA

DISCUSSION

MR. SANDOR CONFIRMED THAT THERE WERE NO PRIVATE DRINKING WATER WELLS IN THE AREA.

ACTION ITEMS:

Ref. 17

Att. B, p.1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM	TELECON NOTE

CONTROL NO: DATE: 6/6/96 TIME: 1300

DISTRIBUTION:
BORNE CHEMICAL FILE

BETWEEN: DONALD GUARIELLO OF: ROSELLE PARK PHONE: 908-245-7676
BOROUGH ENGINEER 245-2721

AND
SWAMY KETHA.

DISCUSSION

Mr. GUARIELLO informed me that Roselle Park receives all its drinking water from Elizabeth Town Water Company. He was not aware of any private drinking water wells in the area.

Swamy S. Ketha 6/6/96

ACTION ITEMS:

Ref. 17

Att. C, p.1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — TELECON NOTE

CONTROL NO: 02-9603-0020 DATE: 6/5/96 TIME: 1505

DISTRIBUTION:

BORNE CHEMICAL FILE

BETWEEN: Frank P. Koczui OF: Roselle, Town Engineer PHONE: (908) 245-5616

AND

SWAMY KETHA.

DISCUSSION

Mr. KOCZUI informed that Roselle receives all its water from Elizabeth Town Water Company. He also informed that he was not aware of any private drinking water wells.

ACTION ITEMS:

Swamy S. Ketha. 6/5/96

Ref. 17

Att. D, p.1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM			TELECON NOTE
CONTROL NO:	DATE: 6/6/96	TIME: 1115	
DISTRIBUTION: BORNE CHEMICAL FILE			
BETWEEN: Adrian	OF: Union Township	PHONE: (908) 688-2800	
AND SWAMY KETHA			

DISCUSSION

Ms. Adrian informed me that the Township gets all its water from Elizabeth Town Water Company. ~~she~~ (KS) She was not aware of any private drinking water wells in the township.

Swamy S. Ketha 6/6/96.

ACTION ITEMS:

Ref. 17

Att. E, p. 1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — TELECON NOTE

CONTROL NO: 02-9603-0020 DATE: 06/05/96 TIME: 1140

DISTRIBUTION:

BORNE CHEMICAL FILE

BETWEEN: Sanjee Varghese OF: City of Newark Dept of Engineering PHONE: 201-256-4965

AND

SWAMY S. KETHA.

DISCUSSION

Mr. Varghese confirmed that the City of Newark obtains its drinking water from both the Pequannock Watershed (W. Milford Twp, Passaic County) and the ~~Intake~~ Reservoir (Ringwood, Passaic County). Mr. Varghese informed that there were no private drinking water wells.

ACTION ITEMS:

Swamy S. Ketha 6/5/96

Ref. 17

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — TELECON NOTE

CONTROL NO: 02-9603-0020 DATE: 6/5/96 TIME: 1430

DISTRIBUTION:

Borne Chemical Company File

BETWEEN: John Kling OF: Bayonne Engg. Dept. PHONE: (201) 858-6080

AND

Swamy Ketha

DISCUSSION

Mr. Kling informed that the City receives water from North Jersey District Water Supply Commission [(201) 835-3600]. The water comes from two reservoirs (1) Wanaque Reservoir and (2) Monksville Reservoir. He also informed that there were no private drinking water wells. During a recent inspection they ~~was~~ found one well which is not presently in use, but was used earlier for Car-wash.

ACTION ITEMS:

Swamy S. Ketha 6/5/96 (KS)

Ref. 17

Att G, p.1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — TELECON NOTE

CONTROL NO: DATE: 6/6/96 TIME: 1400

DISTRIBUTION:

BORNE CHEMICAL FILE

BETWEEN: ALAN BEIO OF: CARTERET TOWNSHIP PHONE: (908) 541-3875

AND

SWAMY KETHA

DISCUSSION

Mr. Beio informed me that Carteret receives all its drinking water from Middlesex Water Company (908-634-1500). He also informed that he was not aware of any private drinking water wells.

Swamy S. Ketha 6/6/96

ACTION ITEMS:

AH.H, p.1

Rel. 12

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — TELECON NOTE

CONTROL NO: DATE: 6/6/96 TIME: 1415

DISTRIBUTION:

BORNE CHEMICAL COMPANY

BETWEEN: STEVE NAGLICH OF: MIDDLE SEX WATER COMPANY PHONE: (908/634-1500

AND

SWAMY KETHA

DISCUSSION

Mr. STEVE NAGLICH informed me that Middlesex water Company gets approximately 85% of its water from intake ~~[illegible]~~ (19) in the Delaware and Raritan Canal. The intake is located near St. Georges Avenue on the side of Johnson & Johnson. 15% of the water is from wells located in South Plainfield (Seventeen wells) and Edison (10 wells). He informed that I could contact Mr. Frank Falco (908-634-1500 Ext. 611) to obtain information on the depth of the wells. Mr. Naglich informed that Middlesex Water Company Supplies water to Carteret, North Edison, Colonia, Iselin, Avenel, Woodbridge Township, Metuchen, Hopelawn, Keasbey, Port Reading. They also sell water in bulk to Sayerville, Old Bridge and Marlboro. Approximately 210,000 people are served.

ACTION ITEMS:

Swamy S. Ketha 6/6/96

Att. I, p. 1

Ref. 17

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — TELECON NOTE

CONTROL NO: 02-9603-0020 DATE: 6/5/96 TIME: 1400

DISTRIBUTION:

BORNE CHEMICAL FILE

BETWEEN: GEORGE VIRCIK PRINCIPAL ENGR. OF: Engineering Dept City of Linden PHONE: (908) 474-8470

AND

SWAMY S. ICETHA

DISCUSSION

Mr. Vircik informed that City of Linden receives all its drinking water from the Elizabeth Town Water Company. He also informed that there were no private drinking water wells in the City.

ACTION ITEMS:

Swamy S. Icetha 6/~~4~~5/96 (15)

Att. J, p.1

Ref. 12

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM — TELECON NOTE

CONTROL NO: DATE: 6/6/96 TIME: 1345

DISTRIBUTION:
BORNE CHEMICAL FILE

BETWEEN: John LUDINGTON OF: RAHWAY WATER DEPT. Asst. Superintendent PHONE: 908 - 388 - 0086

AND
SWAMY ICETHA

DISCUSSION

Mr. Ludington informed me that Rahway had its own treatment plant. They have one intake from North Branch of Rahway River. 96% of the water is taken from this intake. They also have a drinking water well which accounts for approximately 4% of their water distribution. The well name is Well # 6 and is located in Rahway. The depth of the well is 120 ft. Water is supplied to approximately 25,000 residents.

ACTION ITEMS:

Swamy S. Icetha 6/6/96

Ref. 17

Att. K, p.1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: 02-96-03-0020 **DATE:** 03/05/97 **TIME:** 0940

DISTRIBUTION: Burns Chemical Company file

BETWEEN: Staff **OF:** Hillside Public Works **PHONE:** (201) 926-1110

AND K. Campbell

DISCUSSION

Hillside receives its drinking water supply from Elizabethtown Water Company. No known private drinking water wells exist.

ACTION ITEMS:

K. Campbell 03/05/97

Att. L, p.1

Ref. 17

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO: 02-96-03-0020 **DATE:** 03/05/97 **TIME:** 0955

DISTRIBUTION:

- Borns Chemical Company file

BETWEEN: Mr. Hinz **OF:** NYC Dept of Env. Protection Water Supply - Field Operations **PHONE:** (718) 595-6600 (T)

AND

K. Campbell

DISCUSSION

The Borough of Staten Island receives its municipal water supply from the Catskill/Delaware System, located in upstate New York.

ACTION ITEMS:

K. Campbell 03/05/97

Ref. 17

Att. M, p.1

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name John Ludington

Company Rahway Water Dept.

Address

Phone (908) 388-0086

Date 04 / 30 / 97

Time 1540 hrs AM/PM

☑ Originator Placed Call

☐ Originator Received Call

W.O. NO. 1284

Subject Source(s) of drinking water supply for the city of Rahway

Notes: I called to find out the location of the well used by the City of Rahway for a portion of its potable water supply as stated in a previous telecon note (Swamy Ketha communication on 6/6/96). Mr. Ludington said that they currently are not using the well, as there was a problem with the screen that caused the pump to malfunction. Although they hope to eventually obtain the funds necessary to correct the situation, there are no foreseeable plans to resume use of the well. Therefore, all water supplied to the City of Rahway is obtained from their intake in the Rahway River (North Branch). The well is located on the property of the Rahway Intermediate School at Kline Place. The well has not been used for nearly a year.

☑ File Borne Chemical Co. TDD No. 02-9603-0020

☐ Tickle File ____/____/____

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action: Check Hagstrom Map of Union County to locate Kline Place; location is beyond 4-mile radius of Borne Chemical Site (on Perth Amboy Quad)

Originator's initials JLW

Ref. 17

Att. N, p.1

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:

Name Receptionists

Company Elizabethtown Water Company

Address 600 South Avenue
Westfield, NJ

Phone (908) 654-1234

Subject Sources of potable water supply

Date 04/30/97

Time 1535 AM/PM

☑ Originator Placed Call

☐ Originator Received Call

W.O. NO. 1284

Notes: I called the Elizabethtown Water Company to ascertain its source(s) of potable water as supplied to a number of communities in the vicinity of the Borne Chemical Site. The first woman I spoke with said water comes from numerous wells located throughout the Company's distribution area and from a surface water intake on the Raritan River in Bridgewater. For the actual locations of the wells, she said I should speak to a Mr. Sadowski at Ext. 430, she then transferred my call to that extension. I was told that he is on vacation this week. The receptionist at this extension suggested I speak with Bob Perkowski at Ext. 437, but he is not in today. He should be in tomorrow at ~ 8a.m.; he is usually in and out throughout the day. I asked that she leave a message for him to call me tomorrow.

☑ File Borne Chemical Site TDD No. 02-9603-0020

☐ Tickle File ____/____/____

☐ Follow-Up By: ____

☐ Copy/Route To: ____

Follow-Up-Action: ____

Originator's Initials JLW

Ref. 17

Att. O, p.1

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:
Name Bob Piorkowski
Company Elizabethtown Water Co.
Address 600 South Avenue
Westfield, NJ
Phone (908) 654-1234
Subject Well locations

Date 05 / 01 / 97
Time 0840 (AM) PM

☐ Originator Placed Call
☑ Originator Received Call
W.O. NO. 1284

Notes: Bob returned the phone call I had placed to his office yesterday regarding the Elizabethtown Water Company's source(s) of potable water supply. He said they have more than 200 wells throughout the state; not all of these locations are near the Borne Chemical site. For those communities within a 4-mile radius of the Borne Chemical site that are serviced by the Elizabethtown Water Co., he gave me the following information:

Elizabeth - Water is sold to the city but there are no wells located in the city
Roselle Park - no wells
Roselle - There are wells there, but they are not being used because of water quality (VOC contamination) problems
Union - Approximately 20 wells, not all of which are in use
Linden - Not sure; he will check and get back to me
Hillside - Same as above

Bob said he would look into the above matters and get back to me; if the information isn't too extensive, he will fax it to me (I gave him our fax number); otherwise, he'll mail the info if necessary.

☑ File Borne Chemical Co. TDD No. 02-9603-0020
☐ Tickle File ____/____/____
☐ Follow-Up By: ____
☐ Copy/Route To: ____

Follow-Up-Action: ____

Originator's Initials JW

Ref. 17

Att. O, p.2

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:
Name Bob Piorkowski
Company Elizabethtown Water Co. (EWC)
Address 600 South Avenue
Westfield, NJ
Phone (908) 654-1234
Subject Well locations

Date 05 / 01 / 97
Time 1050 (AM) PM

☐ Originator Placed Call
☑ Originator Received Call
W.O. NO. 1284

Notes: Bob called as a follow-up to our earlier conversation regarding the locations of wells used by the EWC in the vicinity of the Borne Chemical Co. site. He said that there are 7 active wells and 1 Ranney collector in Union. He is faxing me a letter summarizing their locations and the presence or absence of wells in the other communities within 4 miles of Borne. He doesn't know the details about the wells such as depth, aquifer of withdrawal, etc. - for that information, I should speak to Rich Sadowski, who will be in next Monday. He did indicate that the water obtain from the intake on the Raritan River is blended with the well water "eventually." He also said he would try to answer any questions I might have after I receive his letter.

☑ File Borne Chemical Co. TDD No. 03-9603-0020
☐ Tickle File ____ / ____ / ____
☐ Follow-Up By: ____
☐ Copy/Route To: ____

Follow-Up-Action: ____

Originator's Initials ____

Ref. 17

Att. O, p.3

Elizabethtown Water Company

Elizabethtown Water Company

Facsimile

To: Joanne Wagner
@Fax: 225-7037
From: Bob Piorkowski
Date: Thursday, May 01, 1997 @ 10:48 AM
Re: Well Loacations
Pages: 2 including this

See attatched list.

Ref. 17

Att. O, p. 4

Elizabethtown Water Company

Bob Piorkowski
908-654-1234 ext.487
Fax.908-756-0753

Thursday, May 01, 1997

Joanne Wagner
Weston Co.
225-6116 Fax:225-7037

Dear Joanne

Here is the list of wells with their addresses and status. If you need further assistance do not hesitate to call.

Elizabeth : E'Town has no wells,but you should check w/ city of Elizabeth.

Hillside : No wells.

Linden : No wells.

Roselle : Chandler Ave - (1) inactive well...Located on Chandler Ave. between Newman and George Sts.

First Ave - (1) inactive well...Located next to Booster Station on First Ave.by Vine St. intersection.

Walburga - (4) Inactive wells...Located on 4 corners of block starting with Wheatsheaf and Raritan .

Roselle Park : No wells.

Union: Hummocks Well Field - (7) ACTIVE wells and (1) ACTIVE Ranney Collector... Located on ~~Morse Ave.~~ Morris Ave. next to Water Sphere off Route 22. (Morris Ave, as per follow-up phone call to Bob Piorkowski

Sincerely,

Bob Piorkowski

Att. O, p. 5

Ref. 17

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:
Name Bob Piorkowski
Company Elizabethtown Water Co.
Address 600 South Avenue
Westfield, NJ
Phone (908) 654-1234
Subject Well locations

Date 05/01/97
Time 1120 AM/PM

☑ Originator Placed Call
☐ Originator Received Call
W.O. NO. 1284

Notes: I called Bob to ascertain the location of the Hummocks Well Field in Union as per the letter he faxed me, as I could not locate "Morse Avenue" on the Hagstrom Map of Union County (the topo map doesn't provide detailed street names). He said that was an error on his part: it should have been stated as Morris Avenue, not Morse Avenue. Morris Avenue is also known as Route 82; the wells are located at the intersection of Morris Avenue and Route 22, on the south eastbound side of Route 22, in a "swampy" area. [This location is approximately 5 miles northwest of the Borne Chemical Co. site; therefore, the wells are not within a 4-mile radius of the site].

☑ File Borne Chemical Co TDD No 02-9603-0010
☐ Tickle File ____/____/____
☐ Follow-Up By: ____
☐ Copy/Route To: ____

Follow-Up-Action: ____

Originator's Initials JW

Ref. 17

Att. O, p. 6

REW 110-4-83

REFERENCE NO. 18

GERAGHTY & MILLER SPECIAL REPORT

The New Jersey Ground-Water Situation

by David W. Miller

August, 1979 (see telecon note - 02-880332-SI 5/12/87

GERAGHTY & MILLER, INC.
Groundwater
Consultants

HACKENSACK, NEW JERSEY
7 Atlantic Street
Hackensack, New Jersey 07601
(201) 646-1400

SYOSSET, NEW YORK
North Shore Atrium
6800 Jericho Turnpike
Syosset, New York 11791
(516) 921-6060

Ref. 18

THE TRIASSIC LOWLANDS AND THE HIGHLANDS REGION OF NORTHERN NEW JERSEY

The geology and hydrology of northern New Jersey are considerably more complex than the Coastal Plain region. To simplify, it has been divided into two broad areas, the Triassic Lowlands and the Highlands Region (Figure 1). Unlike the Coastal Plain, where the aquifers consist of extensive beds of unconsolidated deposits, the primary water-bearing units in northern New Jersey are sedimentary and crystalline rocks (Figure 11). These vary considerably in their ability to yield water, depending on rock type and location. Both regions are also heavily dependent upon unconsolidated glacial deposits for water supply and where these occur in buried, eroded rock channels and are thick and permeable, the glacial sediments represent the most important source of ground water in both the Triassic Lowlands and the Highlands. Figure 12 shows the general major deposits of glacial origin that may have some ground-water potential.

Geology and Hydrology

Triassic Sediments: The Triassic Lowlands are almost entirely underlain by sedimentary Brunswick Shale. Although its primary permeability is low, appreciable amounts of water are found in joints and fractures. However, unless a signifleant number of these joints and fractures are penetrated by a well, yields can be relatively small. The direction of highest permeability and of the greatest movement of water in response to pumping tends to parallel the strike of the beds, generally southwest to northeast.

Ref 18

p. 2

In general, the principal water-bearing zone of the Triassic rocks ranges from less than 200 feet to 600 feet in depth. The median depth of industrial and municipal supply wells in Bergen County is 260 feet. High-yield wells tapping this aquifer in Essex County are between 300 and 400 feet deep. There appears to be a direct relationship between well yield and thickness of overlying unconsolidated glacial deposits. Wells generally produce more where the overlying deposits are relatively thick, stratified, and coarse-grained. These surface deposits are often in direct hydraulic connection with the bedrock, and act as a source of recharge because of their greater capacity to receive and store precipitation (Figure 12).

A number of high capacity wells tap the Triassic rocks. In Essex County, yields of 35 public supply, industrial, and commercial wells range from 35 to 820 gpm (gallons per minute) and average 364 gpm. Wells over 300 feet deep and larger than 8 inches in diameter have a median yield of 230 gpm in Passaic County. However, the ability to develop high capacity wells is not uniform throughout the region. Many wells drilled during exploration programs are never equipped as production wells because of poor yields.

Igneous rocks associated with the sedimentary formations, principally diabase and basalts, are highly resistant to erosion and form the ridges of the Watchung Mountains and the Palisades. They are poor aquifers, tapped primarily for domestic purposes by wells yielding 5 gpm or less.

Ref. 18

Glacial Sediments: Unconsolidated deposits overlying rock in northern New Jersey consist generally of till, clay, or stratified drift. These deposits are thickest in the valleys and thin or absent in upland areas. Permeable sands and gravels contained within the valley fill sediments that are suitable for ground-water development range in thickness from 50 to several hundred feet. Individual beds that can support high capacity wells are not extensive, and lithology may change radically over as little as 100 feet within the same valley. Well yields commonly reported for the glacial sediments represent successful wells located from a program of test drilling and pumping.

Although the rock aquifers have been mapped in some detail throughout both the Triassic Lowlands and the Highlands Region, the areal extent of important glacial aquifers is relatively unknown except in some of the more heavily developed areas of eastern Morris and western Essex Counties, Union County, the Ramapo River subbasin, and the Rockaway River subbasin (Figure 12).

Public supply and industrial wells tapping the more permeable stratified drift are almost uniformly capable of producing several hundred thousand gpd to more than one mgd. For example, yields of wells completed in Union County in 50 to 200 feet of sand and gravel sediments in Kenilworth-Newark Valley, Summit Valley, Union Valley, and Rahway Valley, average approximately 400 gpm. Wells in Essex and Morris Counties tapping glacial sands and gravels adjacent to the Passaic River and its tributaries produce one to 1.5 mgd. Total pumpage from the system of buried valleys in this latter area is about 20 mgd, with the highest yields from formations receiving recharge from adjacent streams.

Ref. 18

p. 4

mineralized water is found in stratified drift underlain by Precambrian rocks than in stratified drift underlain by shales and sandstones of the Triassic Lowlands. Where there is pumpage from deposits associated with streams, the water induced from the stream significantly affects the quality of ground water pumped from wells.

Salt-water encroachment has been noted in the Triassic shales of the Newark area where heavy industrial pumpage lowered water levels more than 100 feet. Data on the current status of this problem are not readily available. Saline water is also encountered in some unconsolidated deposits adjacent to estuaries.

Summary

Ground water serves as a major municipal, industrial, and domestic source in northern New Jersey. Where surface-water sources are being used to their capacity, even greater dependence will be placed on ground water. However, there are a number of significant constraints on continued development of ground water. In counties such as Bergen, Essex, southern Passaic, Union, and eastern Morris, heavy pumpage of the Brunswick shale and the stratified drift deposits together with consumptive use, has overstressed aquifers on a local basis and limited the availability of new ground-water supplies. In addition, the high degree of urbanization has eliminated many potential sites for new wells and has reduced recharge to the aquifer. In many cases, the large-scale development of particular aquifer areas has undoubtedly resulted in substantial impacts on surface-water sources. Some potential for developing new supplies does exist, but

Ref. 18

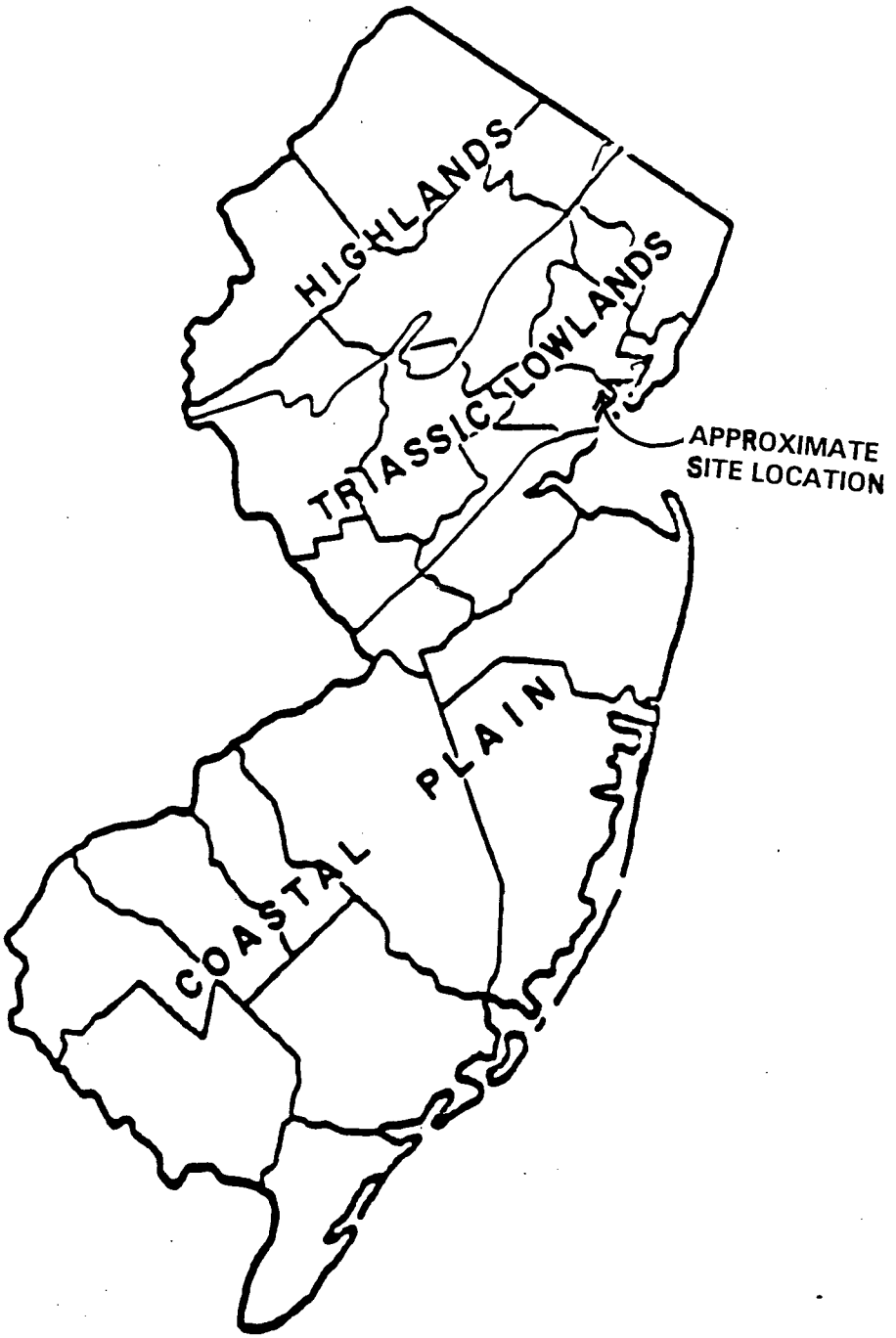


Figure 1 - PRINCIPAL GEOLOGIC REGIONS

Ref. 14

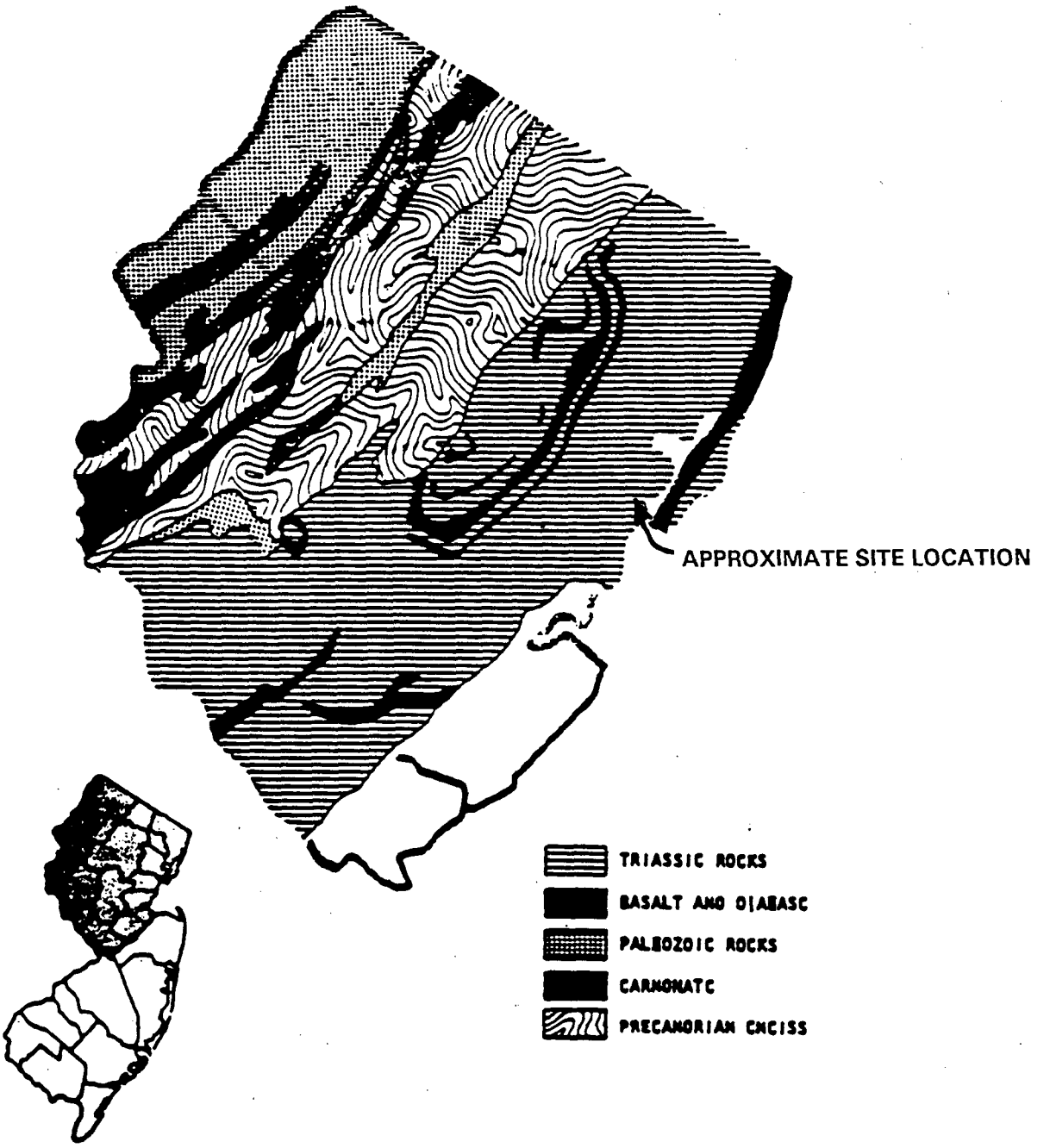


Figure 11 - BEDROCK GEOLOGY IN NORTHERN NEW JERSEY

Ref. 18

p. 7

REFERENCE NO. 19

Geology and Engineering Geology of the New York Metropolitan Area

New York Metropolitan Region
July 20–25, 1989

Field Trip Guidebook T361

Leader: *Charles A. Baskerville, Editor*

Associate Leaders:
Nicholas K. Coch, Sidney Horenstein, Martin Prinz, John H. Puffer, Geneva R. Roberts-Dolgin and Dennis Weiss

American Geophysical Union, Washington, D.C.

Ref. 19

p. 1

GEOLOGY OF NORTHEASTERN NEW JERSEY

John H. Puffer
Geology Department, Rutgers University,
Newark, New Jersey

INTRODUCTION

Northeastern New Jersey largely consists of the Mesozoic red-beds and basaltic rocks of the Newark Basin (fig. 1). These rocks are part of the Newark Supergroup and are bounded on the west by the Ramapo fault that separates the Newark Basin from the Proterozoic gneisses, granites, and early Paleozoic sedimentary rocks of the New Jersey Highlands (in the Reading Prong physiographic province) (fig. 1). These rocks have been modified by Pleistocene glaciation and more recently by the effects of man.

This trip will begin under the George Washington Bridge at the lower contact of the diabasic, early Jurassic Palisades Sill (stop 1 in fig. 1), where it intrudes Triassic Lockatong argillite. We will then travel west through Triassic sediments to the base of the early Jurassic Orange Mountain Basalt where it is exposed at the Great Falls of Paterson, New Jersey. From here we will continue west across the deposits of Glacial Lake Passaic to the Ramapo fault zone and into the Proterozoic Highlands. We will then turn north at the terminal moraine of the Wisconsin ice sheet to examine the Proterozoic gneisses (stop 3 in fig. 1). From the heart of the Highlands, we will return eastward into the Newark Basin to examine the contact between the Jurassic Hook Mountain Basalt and the Towaco Formation exposed at Walter Kidde Dinosaur Park. On our return to New York City, we will pass the huge landfills in the Hackensack Meadowlands.

GEOLOGIC SETTING OF NORTHEASTERN NEW JERSEY

Proterozoic Rocks of the New Jersey Highlands

Granites. Granites are the most abundant rock type in the New Jersey Highlands (fig. 1). Buddington (1959) uses the granite of the Highlands as an example of his "catazonal" level of granite emplacement. He also describes the granites as phacoliths, the most striking feature being the lack of large scale discordant features between the granites and the metamorphic rocks that contain them. Other catazonal characteristics displayed by the Highlands granites include: (1) the presence of gneissic foliation developed throughout the granite; (2) an association with high grade metamorphic rock (at least as high as amphibole grade) and (3) a lack of chill zones. The two major granitic types exposed in the Highlands are Hornblende Granite and Pyroxene Granite.

Hornblende Granite and Alaskite (Byrum Intrusive Suite). Hornblende Granite is found in both the northern and southern blocks of the New Jersey Highlands but is more common in the southern block. Drake (1969) has correlated the Hornblende Granite with the Storm King Granite of New York (Lowe, 1955) based on petrologic similarities. The granite is pinkish-buff to greenish-buff with a distinct gneissoid structure. It contains numerous xenoliths, large amphibolite schlieren and numerous pegmatites. The average composition of the granite is 46.5 percent microperthite and microcline, 26.9 percent quartz, 8.9 percent hornblende, 16.3 percent plagioclase with accessory and trace magnetite, ilmenite, pyrite, apatite, zircon, sphene, biotite, and fluorite. The hornblende, biotite, and magnetite content is highly variable. The granite is mapped as an alaskite by Baker and Buddington (1970) and Sims (1958) where the mafic mineral content is less than five volume percent. The alaskite facies is closely associated with most of the

cyclically deposited gray and black siltstones and argillite. Van Houten (1969) describes two Locatong cycle types as chemical and detrital. The detrital cycles are typically 1 to 6 m thick and consist of a lower laminated black calcareous and pyritic siltstone overlain by gray calcareous siltstone and ripple marked bedded siltstone and fine sandstone. Chemical cycles are typically 3 m thick and consist of black dolomitic siltstone with shrinkage cracks overlain by massive gray or red analcime and carbonate-rich siltstone. The chemical cycles are restricted to the central portion of the Newark Basin. The Lockatong is rich in plant remains, reptile, and fish fossils, as well as spores and pollen.

Passaic Formation. The Passaic Formation is predominantly composed of red siltstone, sandstone, and conglomerate. It generally becomes coarser in the northeastern portion of the Newark Basin. Locally the Passaic contains, in addition to crossbedded, mudcracked, and ripple marked sedimentary structures, the following groups of fossil forms, dinosaur footprints, burrows, arthropods, pelecypods, plant impressions, spores, and pollen. Greenish and brownish arkosic sandstone, quartzitic fanglomerate, impure limestone, and calcareous shale beds are occasionally found interbedded within the Passaic.

Orange Mountain Basalt. The Orange Mountain Basalt consists of two to three thick flows; one or two subaerial flows overlain by a pillowed subaqueous flow. The basalt is a quartz normative tholeiite, composed of plagioclase and augite with minor orthopyroxene and altered olivine in a glassy mesostasis containing quench dendrites of iron-titanium oxides. Augite phenocrysts, glomeroporphyritic aggregates of augite, orthopyroxene, and olivine with a few plagioclase phenocrysts are also characteristic of the basalt (Puffer, 1984, 1987b).

The Orange Mountain Basalt fits into the high-Titanium group of eastern North American tholeiites as proposed by Weigand and Ragland (1970). The chemistry of the basalt is extremely uniform throughout, averaging 51 percent SiO_2, 1.0 percent TiO_2, 14 percent Al_2O_3, 10 percent FeO (total), 8 percent MgO, 10.5 percent CaO, 2.1 percent Na_2O, 0.5 percent K_2O, 0.13 percent P_2O_5, 127 ppm Cu, 183 ppm Sr, 60 ppm Ni, and 116 ppm Zr within a very narrow range.

The vesicles of the basalt and the spaces between the pillows are partially filled with gypsum and glauberite indicating an early stage of leaching. The vesicles and vugs were further filled with carbonates and clay as is typically the case with flows subjected to prolonged groundwater alteration. Burial and hydrothermal activity yielded an assemblage of early stage zeolite facies minerals including stilbite, heulandite, chabazite, pectolite, analcime, datolite, and prehnite (Puffer and Laskowich, 1984).

The base of the Orange Mountain Basalt coincides with over twenty copper deposits that were mined during the Civil War (Puffer, 1987a). The zeolite, prehnite, and copper minerals of the Orange Mountain Basalt can be found at any of several trap-rock quarries in northern New Jersey, but unfortunately, access is strictly forbidden to the public.

Feltville Formation. The Feltville Formation is typically a red siltstone or sandstone including buff, gray, black, and white varieties. Some of these sandstones are coarse grained feldspathic types with less common gray laminated limestone and conglomerate. The feldspathic sandstones of the Feltville superficially resemble the Stocton Formation. The laminated limestone of the Feltville contains abundant fish fossils.

Freakness Basalt. The Preakness Basalt is typically very coarse grained, resembling a diabase. The basalt is composed of a mixture of plagioclase, augite, pigeonite, and magnetite with very little glass. Recent sampling and chemical analyses of the Preakness demonstrated a higher degree of chemical diversity than previously thought (Puffer, unpub. data; Puffer and others, 1981). It now appears that the Preakness Basalt was probably derived

1987).

Fractionation of the portion of the sill within northeastern New Jersey may have resulted in an olivine layer near the base and a granodiorite zone just under the upper chill zone (Walker, 1969). This olivine zone is absent from the northern portion of the sill. Large irregular shaped pods of pegmatitic rock have been found in quarries at the northern end of the sill and are currently being studied by Julie Clay of Lehigh University (personal commun., 1988).

Glacial Geology

Late Wisconsinan (Woodfordian) glaciation, associated with the Hudson Valley ice lobe, overrode earlier drifts and deposited the Harbor Hill moraine across western Long Island and Staten Island, New York and from Perth Amboy, New Jersey across to Summit, New Jersey. This glacial maximum occurred sometime after 22,800 years before present (B.P.) (Sirkin and Stuckenrath, 1975). Proglacial Lakes Hudson, Flushing, and Hackensack were dammed on the south by the Harbor Hill moraine. Proglacial Lake Passaic was formed between the Orange Mountain Basalt ridge and the New Jersey Highlands to the west at a higher elevation and is presumed to have been coeval with the other three lakes.

Glacial Lake Hackensack extended north from Arthur Kill, Newark Bay, the Hackensack River, and into New York State. Near Hackensack, New Jersey the lake was about 22 km wide (Schuberth, 1968). At least 2,550 varves were deposited in Lake Hackensack, making a thickness of more than 65 m (Widmer, 1964). Borings done for the U.S. Army Corps of Engineers show that the glacially scoured bedrock valley under glacial Lake Hackensack is from 2 to 3 km wide (Agron, 1980). When Lake Hackensack was drained, it became a level wetland known as the Hackensack Meadows. About 3,000 to 5,000 years B.P., rising sea levels reached the outlet of the Hackensack River to Kill Van Kull and Arthur Kill, exposing the river to tides (Agron, 1980). As sea level continued to rise, estuarine conditions extended into the Hackensack Meadowlands producing the current (Holocene) salt marsh environment.

FIELD TRIP STOPS

Stop 1: Ross Dock.

The lower contact between the Palisades Sill and the hornfels of the Lockatong Formation is exposed here (1 in figs. 1 and 3). The fine-grained diabase chill zone here consists of about 1 percent olivine (Fo_{80}), 49 percent plagioclase (An_{64}), and 50 percent pyroxene (augite and hypersthene). Tholeiitic-trend fractionation of the diabase magma culminated in the development of a granophyre layer about 100 ft (30 m) thick near the upper contact of the 1,100 ft (335 m) thick sill. Some thin white veins of late quartzofeldspathic granophyre cut the diabase along the road.

A 10 to 13 ft (3 to 4 m) thick olivine enriched zone is exposed 52 ft (16 m) above the road level and is also exposed at road level 0.1 mi (0.2 km) east of the entrance to Palisades Park. North along the road, observe a metamorphosed buff arkose exposed 0 to 250 ft (0 to 76 m) and 600 to 800 ft (183 to 244 m) north of the chill zone contact, also note the metamorphosed platy, laminated siltstone 250 to 600 ft (76 to 183 m) north of this same contact. These metasediments have been described by Olsen (1980). The pelitic layers have been particularly affected by contact metamorphism and have been converted to black hornfels consisting of biotite and albite with minor analcime, diopside, and calcite, or to green hornfels consisting of diopside, grossularite, chlorite, and calcite with minor biotite, feldspar, amphibole,and prehnite (Van Houten, 1969).

Porphyroblasts of pinite after cordierite commonly occur as small green spots in the black biotite-albite hornfels. Large tourmaline porphyroblasts and even larger green spherical structures up to 1.5 in (4 cm) across that are composed of clinozoisite, are less common in the hornfels but have been found in several contact-metamorphosed rocks located throughout the Newark Basin.

Ref 19

REFERENCE NO. 20

federal register

Friday
December 14, 1990

Part II

Environmental Protection Agency

40 CFR Part 300
Hazard Ranking System; Final Rule

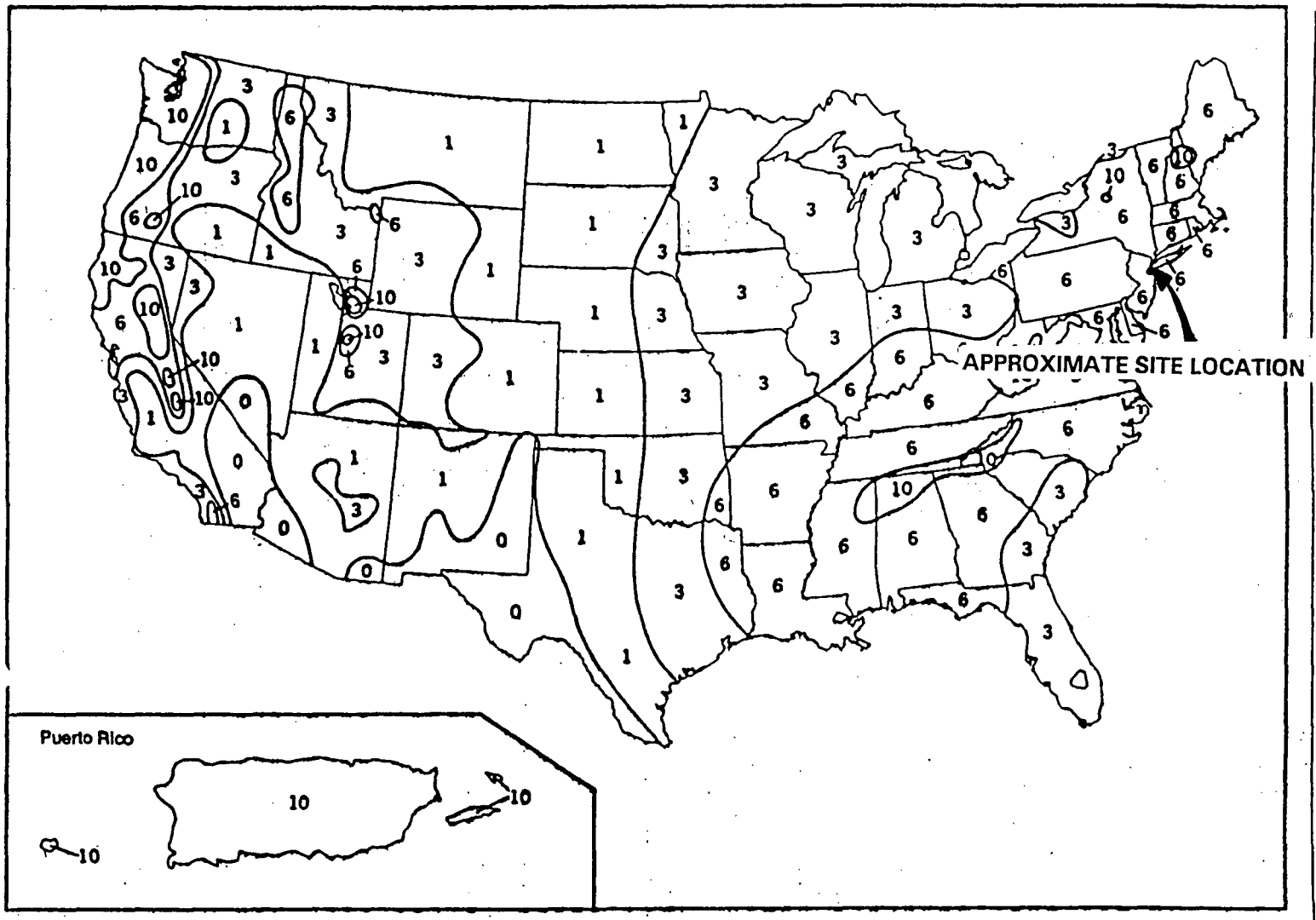


FIGURE 3-2
NET PRECIPITATION FACTOR VALUES

–When measured monthly evapotranspiration is not available, calculate monthly potential evapotranspiration (E_i) as follows:

$$E_i = 0.6\, F_i\, (10\, T_i/I)^a$$

where:

E_i = Monthly potential evapotranspiration (inches) for month i.

F_i = Monthly latitude adjusting value for month i.

T_i = Mean monthly temperature (°C) for month i.

$$I = \sum_{i=1}^{12} (T_i/S)^{1.514}$$

$$a = 6.75 \times 10^{-7} I^3 - 7.71 \times 10^{-5} I^2 + 1.79 \times 10^{-2} I + 0.49239$$

Select the latitude adjusting value for each month from Table 3–3. For latitudes lower than 50° North or 20° South, determine the monthly latitude adjusting value by interpolation.

• Calculate monthly net precipitation by subtracting monthly evapotranspiration (or monthly potential evapotranspiration) from monthly precipitation. If evapotranspiration (or potential evapotranspiration) exceeds precipitation for a month, assign that month a net precipitation value of 0.

• Calculate the annual net precipitation by summing the monthly net precipitation values.

• Based on the annual net precipitation, assign a net precipitation factor value from Table 3–4.

Enter the value assigned from Figure 3–2 or from Table 3–4, as appropriate, in Table 3–1.

TABLE 3–3.—MONTHLY LATITUDE ADJUSTING VALUES[a]

Latitude[b] (degrees)	Month											
	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
≥50 N	0.74	0.78	1.02	1.15	1.33	1.36	1.37	1.25	1.06	0.92	0.76	0.70
45 N	0.80	0.81	1.02	1.13	1.28	1.29	1.31	1.21	1.04	0.94	0.79	0.75
40 N	0.84	0.83	1.03	1.11	1.24	1.25	1.27	1.18	1.04	0.96	0.83	0.81
35 N	0.87	0.85	1.03	1.09	1.21	1.21	1.23	1.16	1.03	0.97	0.89	0.85
30 N	0.90	0.87	1.03	1.08	1.18	1.17	1.20	1.14	1.03	0.98	0.89	0.86
20 N	0.95	0.90	1.03	1.05	1.13	1.11	1.14	1.11	1.02	1.00	0.93	0.94
10 N	1.00	0.91	1.03	1.03	1.08	1.06	1.08	1.07	1.02	1.02	0.98	0.99
0	1.04	0.94	1.04	1.01	1.04	1.01	1.04	1.04	1.01	1.04	1.01	1.04
10 S	1.08	0.97	1.05	0.99	1.00	0.96	1.00	1.02	1.00	1.06	1.05	1.09
20 S	1.14	0.99	1.05	0.97	0.96	0.91	0.95	0.99	1.00	1.08	1.09	1.15

[a] Do not round to nearest integer.
[b] For unlisted latitudes lower than 50° North or 20° South, determine the latitude adjusting value by interpolation.

TABLE 3–4.—NET PRECIPITATION FACTOR VALUES

Net precipitation (inches)	Assigned value
0	0
Greater than 0 to 5	1
Greater than 5 to 15	3
Greater than 15 to 30	6
Greater than 30	10

3.1.2.3 *Depth to aquifer.* Evaluate depth to aquifer by determining the depth from the lowest known point of hazardous substances at a site to the top of the aquifer being evaluated, considering all layers in that interval. Measure the depth to an aquifer as the distance from the surface to the top of the aquifer minus the distance from the surface to the lowest known point of hazardous substances eligible to be evaluated for that aquifer. In evaluating depth to aquifer in karst terrain, assign a thickness of 0 feet to a karst aquifer that underlies any portion of the sources at the site. Based on the calculated depth, assign a value from Table 3–5 to the depth to aquifer factor.

Determine the depth to aquifer only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the depth to aquifer factor for any aquifer that does not have an observed release. If the necessary geologic information is available at multiple locations, calculate the depth to aquifer at each location. Use the location having the smallest depth to assign the factor value. Enter this value in Table 3–1.

TABLE 3–5.—DEPTH TO AQUIFER FACTOR VALUES

Depth to aquifer[a] (feet)	Assigned value
Less than or equal to 25	5
Greater than 25 to 250	3
Greater than 250	1

[a] Use depth of all layers between the hazardous substances and aquifer. Assign a thickness of 0 feet to any karst aquifer that underlies any portion of the sources at the site.

3.1.2.4 *Travel time.* Evaluate the travel time factor based on the geologic materials in the interval between the lowest known point of hazardous substances at the site and the top of the aquifer being evaluated. Assign a value to the travel time factor as follows:

• If the depth to aquifer (see section 3.1.2.3) is 10 feet or less, assign a value of 35.

• If, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

• Otherwise:

–Select the lowest hydraulic conductivity layer(s) from within the above interval. Consider only layers at least 3 feet thick. However, do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

–Determine hydraulic conductivities for individual layers from Table 3–6 or from in-situ or laboratory tests. Use representative, measured, hydraulic conductivity values whenever available.

–If more than one layer has the same lowest hydraulic conductivity, include all such layers and sum their thicknesses. Assign a thickness of 0 feet to a karst layer that underlies any portion of the sources at the site.

–Assign a value from Table 3–7 to the travel time factor, based on the thickness and hydraulic conductivity of the lowest hydraulic conductivity layer(s).

TABLE 3-6.—HYDRAULIC CONDUCTIVITY OF GEOLOGIC MATERIALS

Type of material	Assigned hydraulic conductivity [a] (cm/sec)
Clay; low permeability till (compact unfractured till); shale; unfractured metamorphic and igneous rocks	10^{-8} 10^{-8}
Silt; loesses; silty clays; sediments that are predominantly silts; moderately permeable till (fine-grained, unconsolidated till, or compact till with some fractures); low permeability limestones and dolomites (no karst); low permeability sandstone; low permeability fractured igneous and metamorphic rocks	10^{-6} 10^{-6}
Sands; sandy silts; sediments that are predominantly sand; highly permeable till (coarse-grained, unconsolidated or compact and highly fractured); peat; moderately permeable limestones and dolomites (no karst); moderately permeable sandstone; moderately permeable fractured igneous and metamorphic rocks	10^{-4} 10^{-4}
Gravel; clean sand; highly permeable fractured igneous and metamorphic rocks; permeable basalt; karst limestones and dolomites	10^{-2} 10^{-2}

[a] Do not round to nearest integer.

TABLE 3-7.—TRAVEL TIME FACTOR VALUES [a]

Hydraulic conductivity (cm/sec)	Thickness of lowest hydraulic conductivity layer(s) [b] (feet)			
	Greater than 3 to 5	Greater than 5 to 100	Greater than 100 to 500	Greater than 500
Greater than or equal to 10^{-3}	35	35	35	25
Less than 10^{-3} to 10^{-4}	35	25	15	15
Less than 10^{-4} to 10^{-6}	15	15	8	5
Less than 10^{-6}	5	5	1	1

[a] If depth to aquifer is 10 feet or less or if, for the interval being evaluated, all layers that underlie a portion of the sources at the site are karst, assign a value of 35.

[b] Consider only layers at least 3 feet thick. Do not consider layers or portions of layers within the first 10 feet of the depth to the aquifer.

Determine travel time only at locations within 2 miles of the sources at the site, except: if observed ground water contamination attributable to sources at the site extends more than 2 miles beyond these sources, use any location within the limits of this observed ground water contamination when evaluating the travel time factor for any aquifer that does not have an observed release. If the necessary subsurface geologic information is available at multiple locations, evaluate the travel time factor at each location. Use the location having the highest travel time factor value to assign the factor value for the aquifer. Enter this value in Table 3-1.

3.1.2.5 *Calculation of potential to release factor value.* Sum the factor values for net precipitation, depth to aquifer, and travel time, and multiply this sum by the factor value for containment. Assign this product as the potential to release factor value for the aquifer. Enter this value in Table 3-1.

3.1.3 *Calculation of likelihood of release factor category value.* If an observed release is established for an aquifer, assign the observed release factor value of 550 as the likelihood of release factor category value for that aquifer. Otherwise, assign the potential to release factor value for that aquifer as the likelihood of release value. Enter the value assigned in Table 3-1.

3.2 *Waste characteristics.* Evaluate the waste characteristics factor category for an aquifer based on two factors: toxicity/mobility and hazardous waste quantity. Evaluate only those hazardous substances available to migrate from the sources at the site to ground water. Such hazardous substances include:

- Hazardous substances that meet the criteria for an observed release to ground water.
- All hazardous substances associated with a source that has a ground water containment factor value greater than 0 (see sections 2.2.2, 2.2.3, and 3.1.2.1).

3.2.1 *Toxicity/mobility.* For each hazardous substance, assign a toxicity factor value, a mobility factor value, and a combined toxicity/mobility factor value as specified in the following sections. Select the toxicity/mobility factor value for the aquifer being evaluated as specified in section 3.2.1.3.

3.2.1.1 *Toxicity.* Assign a toxicity factor value to each hazardous substance as specified in Section 2.4.1.1.

3.2.1.2 *Mobility.* Assign a mobility factor value to each hazardous substance for the aquifer being evaluated as follows:

- For any hazardous substance that meets the criteria for an observed release by chemical analysis to one or more aquifers underlying the sources at the site, regardless of the aquifer being evaluated, assign a mobility factor value of 1.
- For any hazardous substance that does not meet the criteria for an observed release by chemical analysis to at least one of the aquifers, assign that hazardous substance a mobility factor value from Table 3-8 for the aquifer being evaluated, based on its water solubility and distribution coefficient (K_d).
- If the hazardous substance cannot be assigned a mobility factor value because data on its water solubility or distribution coefficient are not available, use other hazardous substances for which information is available in evaluating the pathway.

TABLE 3-8.—GROUND WATER MOBILITY FACTOR VALUES [a]

Water solubility (mg/l)	Distribution coefficient (K_d) (ml/g)			
	Karst [b]	≤ 10	> 10 to 1,000	> 1,000
Present as liquid [c]	1	1	0.01	0.0001
Greater than 100	1	1	0.01	0.0001
Greater than 1 to 100	0.2	0.2	0.002	2×10^{-5}
Greater than 0.01 to 1	0.002	0.002	2×10^{-5}	2×10^{-5}
Less than or equal to 0.01	2×10^{-6}	2×10^{-6}	2×10^{-6}	2×10^{-6}

[a] Do not round to nearest integer.
[b] Use if the hazardous substance is present or deposited as a liquid.
[c] Use if the entire interval from the source to the aquifer being evaluated is karst.

Drainage area. Determine the drainage area for the sources at the site. Include in this drainage area both the source areas and the area upgradient of the sources, but exclude any portion of this drainage area for which runoff is diverted from entering the sources by storm sewers or run-on control and/or runoff management systems. Assign a drainage area value for the watershed from Table 4-3.

Soil group. Based on the predominant soil group within the drainage area described above, assign a soil group designation for the watershed from Table 4-4 as follows:

- Select the predominant soil group as that type which comprises the largest total area within the applicable drainage area.
- If a predominant soil group cannot be delineated, select that soil group in the drainage area that yields the highest value for the runoff factor.

Calculation of runoff factor value. Assign a combined rainfall/runoff value for the watershed from Table 4-5, based on the 2-year, 24-hour rainfall and the soil group designation. Determine the runoff factor value for the watershed from Table 4-6, based on the rainfall/runoff and drainage area values. Enter the runoff factor value in Table 4-1.

TABLE 4-3.—DRAINAGE AREA VALUES

Drainage area (acres)	Assigned value
Less than 50	1
50 to 250	2
Greater than 250 to 1,000	3
Greater than 1,000	4

TABLE 4-4.—SOIL GROUP DESIGNATIONS

Surface soil description	Soil group designation
Coarse-textured soils with high infiltration rates (for example, sands, loamy sands).	A
Medium-textured soils with moderate infiltration rates (for example, sandy loams, loams).	B
→ Moderately fine-textured soils with low infiltration rates (for example, silty loams, silts, sandy clay loams).	C
Fine-textured soils with very low infiltration rates (for example, clays, sandy clays, silty clay loams, clay loams, silty clays); or impermeable surfaces (for example, pavement).	D

TABLE 4-5.—RAINFALL/RUNOFF VALUES

2-Year, 24-hour rainfall (inches)	Soil group designation			
	A	B	C	D
Less than 1.0	0	0	2	3
1.0 to less than 1.5	0	1	2	3
1.5 to less than 2.0	0	2	3	4
2.0 to less than 2.5	1	2	3	4
2.5 to less than 3.0	2	3	4	4
3.0 to less than 3.5	2	3	4	5
3.5 or greater	3	4	5	6

TABLE 4-6.—RUNOFF FACTOR VALUES

Drainage area value	Rainfall/runoff value						
	0	1	2	3	4	5	6
1	0	0	0	1	1	1	1
2	0	0	1	1	2	3	4
3	0	0	1	3	7	11	15
4	0	1	2	7	17	25	25

4.1.2.1.2.1.3 *Distance to surface water.* Evaluate the distance to surface water as the shortest distance, along the overland segment, from any source with a surface water containment factor value greater than 0 to either the mean high water level for tidal waters or the mean water level for other surface waters. Based on this distance, assign a value from Table 4-7 to the distance to surface water factor for the watershed. Enter this value in Table 4-1.

4.1.2.1.2.1.4 *Calculation of factor value for potential to release by overland flow.* Sum the factor values for runoff and distance to surface water for the watershed and multiply this sum by the factor value for containment. Assign the resulting product as the factor value for potential to release by overland flow for the watershed. Enter this value in Table 4-1.

4.1.2.1.2.2 *Potential to release by flood.* Evaluate potential to release by flood for each watershed as the product of two factors: containment (flood) and flood frequency. Evaluate potential to release by flood separately for each source that is within the watershed. Furthermore, for each source, evaluate potential to release by flood separately for each category of floodplain in which the source lies. (See section 4.1.2.1.2.2.2 for the applicable floodplain categories.) Calculate the value for the potential to release by flood factor as specified in 4.1.2.1.2.2.3.

4.1.2.1.2.2.1 *Containment (flood).* For each source within the watershed, separately evaluate the containment (flood) factor for each category of floodplain in which the source is partially or wholly located. Assign a containment (flood) factor value from Table 4-8 to each floodplain category applicable to that source. Assign a containment (flood) factor value of 0 to each floodplain category in which the source does not lie.

4.1.2.1.2.2.2 *Flood frequency.* For each source within the watershed, separately evaluate the flood frequency factor for each category of floodplain in which the source is partially or wholly located. Assign a flood frequency factor value from Table 4-9 to each floodplain category in which the source is located.

4.1.2.1.2.2.3 *Calculation of factor value for potential to release by flood.* For each source within the watershed and for each category of floodplain in which the source is partially or wholly located, calculate a separate potential to release by flood factor value. Calculate this value as the product of the containment (flood) value and the flood frequency value applicable to the source for the floodplain category. Select the highest value calculated for those sources that meet the minimum size requirement specified in section 4.1.2.1.2.1.1 and assign it as the value for the potential to release by flood factor for the watershed. However, if, for this watershed, no source at the site meets the minimum size requirement, select the highest value calculated for the sources at the site eligible to be evaluated for this watershed and assign it as the value for this factor.

TABLE 4-7.—DISTANCE TO SURFACE WATER FACTOR VALUES

Distance	Assigned value
Less than 100 feet	25
100 feet to 500 feet	20
Greater than 500 feet to 1,000 feet	16
Greater than 1,000 feet to 2,500 feet	9
Greater than 2,500 feet to 1.5 miles	6
Greater than 1.5 miles to 2 miles	3

TABLE 4-8.—CONTAINMENT (FLOOD) FACTOR VALUES

Containment criteria	Assigned value
Documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by the flood being evaluated.	0
Other	10

TABLE 4-9.—FLOOD FREQUENCY FACTOR VALUES

Floodplain category	Assigned value
Source floods annually	50
Source in 10-year floodplain	50
Source in 100-year floodplain	25
Source in 500-year floodplain	7
None of above	0

Enter this highest potential to release by flood factor value for the watershed in Table 4-1, as well as the values for containment (flood) and flood frequency that yield this highest value.

4.1.2.1.2.3 *Calculation of potential to release factor value.* Sum the factor values assigned to the watershed for potential to release by overland flow and potential to release by flood. Assign this sum as the potential to release factor value for the watershed, subject to a maximum value of 500. Enter this value in Table 4-1.

4.1.2.1.3 *Calculation of drinking water threat-likelihood of release factor category value.* If an observed release is established for the watershed, assign the observed release factor value of 550 as the likelihood of release factor category value for that watershed. Otherwise, assign the potential to release factor value for that watershed as the likelihood of release factor category value for that watershed. Enter the value assigned in Table 4-1.

4.1.2.2 *Drinking water threat-waste characteristics.* Evaluate the waste characteristics factor category for each

p.5

the hazardous substance with the highest toxicity/persistence factor value for the watershed to assign the toxicity/persistence factor value for the drinking water threat for the watershed. Enter this value in Table 4-1.

4.1.2.2.3 *Hazardous waste quantity.* Assign a hazardous waste quantity factor value for the watershed as specified in section 2.4.2. Enter this value in Table 4-1.

4.1.2.2.3 *Calculation of drinking water threat-waste characteristics factor category value.* Multiply the toxicity/persistence and hazardous waste quantity factor values for the watershed, subject to a maximum product of 1 x 10⁸. Based on this product, assign a value from Table 2-7 (section 2.4.3.1) to the drinking water threat-waste characteristics factor category for the watershed. Enter this value in Table 4-1.

TABLE 4-12.—TOXICITY/PERSISTENCE FACTOR VALUES [a]

Persistence factor value	Toxicity factor value					
	10,000	1,000	100	10	1	0
1.0	10,000	1,000	100	10	1	0
0.4	4,000	400	40	4	0.4	0
0.07	700	70	7	0.7	0.07	0
0.0007	7	0.7	0.07	0.007	0.0007	0

[a] Do not round to nearest integer.

4.1.2.3 *Drinking water threat-targets.* Evaluate the targets factor category for each watershed based on three factors: nearest intake, population, and resources.

To evaluate the nearest intake and population factors, determine whether the target surface water intakes are subject to actual or potential contamination as specified in section 4.1.1.2. Use either an observed release based on direct observation at the intake or the exposure concentrations from samples (or comparable samples) taken at or beyond the intake to make this determination (see section 4.1.2.1.1). The exposure concentrations for a sample (that is, surface water, benthic, or sediment sample) consist of the concentrations of those hazardous substances present that are significantly above background levels and attributable at least in part to the site (that is, those hazardous substance concentrations that meet the criteria for an observed release).

When an intake is subject to actual contamination, evaluate it using Level I concentrations or Level II concentrations. If the actual contamination is based on an observed release by direct observation, use Level II concentrations for that intake. However, if the actual contamination is based on an observed release from samples, determine which level applies for the intake by comparing the exposure concentrations from samples (or comparable samples) to health-based benchmarks as specified in sections 2.5.1 and 2.5.2. Use the health-based benchmarks from Table 3-10 (section 3.3.3) in determining the level of contamination from samples. For contaminated sediments with no identified source, evaluate the actual contamination using Level II concentrations (see section 4.1.1.2).

4.1.2.3.1 *Nearest intake.* Evaluate the nearest intake factor based on the drinking water intakes along the overland/flood hazardous substance migration path for the watershed. Include standby intakes in evaluating this factor only if they are used for supply at least once a year.

Assign the nearest intake factor a value as follows and enter the value in Table 4-4:

- If one or more of these drinking water intakes is subject to Level I concentrations as specified in section 4.1.2.3, assign a factor value of 50.
- If not, but if one or more of these drinking water intakes is subject to Level II concentrations, assign a factor value of 45.
- If none of these drinking water intakes is subject to Level I or Level II concentrations, determine the nearest of these drinking water intakes, as measured from the probable point of entry (or from the point where measurement begins for contaminated sediments with no identified source). Assign a dilution weight from Table 4-13 to this intake, based on the type of surface water body in which it is located. Multiply this dilution weight by 23, round the product to the nearest integer, and assign it as the factor value.

Assign the dilution weight from Table 4-13 as follows:

TABLE 4-13.—SURFACE WATER DILUTION WEIGHTS

Type of surface water body [a]		Assigned dilution weight [b]
Descriptor	Flow characteristics	
Minimal stream	Less than 10 cfs [c]	1
Small to moderate stream	10 to 100 cfs	0.1
Moderate to large stream	Greater than 100 to 1,000 cfs	0.01
Large stream to river	Greater than 1,000 to 10,000 cfs	0.001
Large river	Greater than 10,000 to 100,000 cfs	0.0001
Very large river	Greater than 100,000 cfs	0.00001
Coastal tidal waters [d]	Flow not applicable, depth not applicable	0.0001
Shallow ocean zone [e] or Great Lake	Flow not applicable, depth less than 20 feet	0.0001
Moderate depth ocean zone [e] or Great Lake	Flow not applicable, depth 20 to 200 feet	0.00001
Deep ocean zone [e] or Great Lake	Flow not applicable, depth greater than 200 feet	0.000005
3-mile mixing zone in quiet flowing river	10 cfs or greater	0.5

[a] Treat each lake as a separate type of water body and assign a dilution weight as specified in text
[b] Do not round to nearest integer.
[c] cfs = cubic feet per second.
[d] Embayments, harbors, sounds, estuaries, back bays, lagoons, wetlands, etc., seaward from mouths of rivers and landward from baseline of Territorial Sea.
[e] Seaward from baseline of Territorial Sea. This baseline represents the generalized U.S. coastline. It is parallel to the seaward limit of the Territorial Sea and other maritime limits such as the inner boundary of the Federal fisheries jurisdiction and the limit of States jurisdiction under the Submerged Lands Act as amended.

- For a river (that is, surface water body types specified in Table 4-13 as minimal stream through very large river), assign a dilution weight based on the average annual flow in the river at the intake. If available, use the average annual discharge as defined in the U.S. Geological Survey Water Resources Data Annual Report. Otherwise, estimate the average annual flow.
- For a lake, assign a dilution weight as follows:
  - For a lake that has surface water flow entering the lake, assign a dilution weight based on the sum of the

p. 6

REFERENCE NO. 21

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Borne Chemical file

DATE: 02/27/97

FROM: K. Campbell (KC)

SUBJECT: On-Site Materials (Pre-1980)

REFERENCE

Background information indicates that a variety of materials were handled on site prior to 1980. The following presents a brief summary of these materials:

December 27, 1960 - cresylic acid, formaldehyde (Attachment A);

March 29, 1966 - glycol/water mix (Attachment B);

August 14, 1867 - possible spent sulfiiric acid storage (Attachment C);

June 30, 1970 - carbon tetrachloride distillation (Attachment D);

September 13, 1972 - dibenzyl disulfide (Attachment E);

August 12, 1976 - oil via Coastal Services from Barrett Substation, Oceanside, NY (Attachment F); and

December 26, 1978 - 2 shipments of "oily sand and debris" (15 yd. of material each) through Coastal Services to Edgeboro Disposal (Attachment G).

Miscellaneous Shipping Receipts dated April 1974 to October 1979 indicate that the following chemicals were shipped off site: zinc oxide, acetone, methyl ethyl ketone, methanol, and toluene (Attachment H).

Ref 29

ATLAS REFINERY, INC.
ESTABLISHED 1887
TANNING • INDUSTRIAL • TEXTILE OILS
142 LOCKWOOD STREET
NEWARK 5
NEW JERSEY
CHICAGO, ILL.

December 27, 1960

Mr. Tom Marino
Borne Chemical Company
632 South Front Street
Elizabeth, New Jersey

Dear Tom:

In line with our recent telephone conversation, we are sending the following products to your plant so that you can make "Product A" and possibly "Product B" on a plant scale of 400 lbs. (one drum):

2 bags Glauber Salt
1 gal. Cresylic Acid
1 bag Spruce (Min. 24 lbs.)
1 gal. Formaldehyde
1 bag Kelkote (Flour)
1 drum "oil portion"
1 container Gum Tragacanth (Min. 4 lbs.)

It is our understanding that you will compound this into Product A and return one drum to us at Newark. You will have enough material to make a drum of each product. It is our opinion that if Product A can be made, Product B could also be made in the same equipment, and we hope this will be the case since we are in need of both products.

The volume outlook is that Product A will be approximately 30 drums per month and Product B approximately 15 drums per month.

We look forward to hearing from you about the outcome of this trial run.

Very truly yours,

Arthur F. Schroeder, Jr.
President

AFS:dg

Att. A, p. 1

Ref. 29

SCIENTIFIC CHEMICAL TREATMENT CO., INC.
60 Prince Street * Elizabeth, New Jersey 07207 * Phone 351-2020

March 29, 1966

Kenne Chemical Company, Inc.
632 South Front Street
Elizabeth, New Jersey

Attention Mr. T. Marino

Dear Mr. Marino:

Confirming our telephone conversation, this will serve as your authorization to dump the following which has been stored at your plant:

5,000 gal. approx.	Glycol/water mix - finished product
23,000 gal. approx.	Glycol/water mix - crude.

Very truly yours,

SCIENTIFIC CHEMICAL TREATMENT CO., INC.
CHEMSOL CHEMICAL MARKETING DIVISION

Hans H. Schafft

Hans H. Schafft
Vice President

HHS:MF

Ref. 2d

AH. B, p. 1

August 15, 1967

TO:

W. M. SNOK
C. H. KOLB

Allied Chemical (Mr. Don Williams, Plant Engr.) inquired for spent sulfuric acid storage capacity of up to 300,000 gallons, which would be used for six (6) months or more.

The 160,000 gallon fuel oil tank should be cleaned and inspected. Based upon the results of the inspection a program for repairs and insurance company inspection will be worked out.

Should Allied be interested in this tank, our charges to them for acid storage would be:

$2.50/month/1,000 gallons tank capacity;

Minimum turn-over of 160,000 gallons per six months;

IN plus OUT charge of 1.5 cents/gallon.

C. J. Fitzer

CJF.g

Ref 21

Att. C, p.1

G A F Corporation
Dyestuff & Chemical Division
Post Office Box 12
Linden, New Jersey 07036
Telephone (201) 456-2600

June 30, 1970

Mr. E. Kay
632 South Front Street
Elizabeth, New Jersey

Dear Mr. Kay:

This is to confirm our agreement relative to the distillation of our recovered carbon tetrachloride. Sixteen 55-gallon drums were shipped to your plant on June 22, 1970 for processing through your distillation unit.

Terms of the agreement are five cents per pound of distillate.

Our Purchasing Department will issue Purchase Order 20088 accordingly.

Future distillation is subject to a renegotiation of costs based on the experience developed during the current run.

With kindest regards.

Very truly yours,

GAF CORPORATION

Fred A. Eschle
Production Services Dept.

FAE/bea

Att. D, p.1

Ref. 21

CHEVRON OIL COMPANY PURCHASING AGENT

BORNE CHEMICAL COMPANY, INC.

005076

FORMERLY

BORNE, SCRYMSER COMPANY

ESTABLISHED 1874

632 SOUTH FRONT STREET
ELIZABETH, NEW JERSEY

No. 17826

DATE September 13, 1972 TERMS NET 30 Days

SHIPPED BY ORDER AND FOR ACCOUNT AND RISK OF Chevron Oil Company, Purchasing Agent for
Chevron Oil Italiana S.P.A.
1200 State Street
Perth Amboy, New Jersey

ON BOARD THE STEAMER

FROM ~~New York, N.Y.~~ TO ~~Genoa~~

1125	Fibre Drums DIBENZYL DISULFIDE Item No.1 1210 Gross Lbs. 1125 Net Lbs. Net Lbs. @.42 Lb. F.O.B. Elizabeth, New Jersey	$472.50
	242 Gross Lbs. each 109.8 Gross Kilos each 17 Tare Lbs. each 7.7 Tare Kilos each 225 Net Lbs. each 102.1 Net Kilos each	
	Measurements- 18¼" x 36½" x 18¼" each	
	CHEVRON C01-72/348 CHEVRON OIL ITALIANA S.P.A. Through GENOA PORT Nos.1/5	CHEVRON ORDER NO. C01-72/348 "MADE IN U.S.A."
	Schedule B Commodity No.599.7515	
	"I hereby certify that the above Is true and correct and that the materials covered by this invoice are of U.S.A. origin."	
	Borne Chemical Company, Inc.	

Att. E, p.1

Ref. 29

SINCE 1874

BORNE CHEMICAL COMPANY, INC.

Elizabeth, N. J. 07207
201-351-1717 N.Y. 212-732-5070

BORNE'S DIBENZYL DISULFIDE No. D-200

DIBENZYL DISULFIDE is a stable, aromatic, extreme pressure additive containing 25% noncorrosive sulfur.

TYPICAL PROPERTIES

Form..... Small Flakes
Color..... White to light pink
Melting Point.....65/67° C
Sulfur.....25/26.5%
Corrosion, A.S.T.M. No.130D (2% solution)
3 hours @ 212°F..... 1B Max.
Molecular Weight (theoretical). 247

Solubilities @ ambient temperatures:
Solvent refined 100/100 oil..... 3%
Solvent refined SAE 90 oil..... 4%
Naphthenic 100/100 oil..... 5%

Application Information:

D.B.D.S. is used as an extreme pressure additive. Lube oils and greases give outstanding performance on both Timken and S.A.E. test machines after a small addition of D.B.D.S. Low concentrations of D.B.D.S. do not affect cost materially, and do not change the color or the viscosity of oils in which it is blended.

D.B.D.S. is also used successfully as an anti-oxidant and anti-sludging agent for petroleum oils, petrolatum and paraffinic waxes. As little as 0.5% D.B.D.S. will prevent acid formation under oxidizing conditions and eliminate sludging tendencies.

It is used successfully with sulfur bases, Sulfur-chlorinated bases, Alpho-chlor 33 and Lead Naphthenate in extreme pressure compounds.

D.B.D.S. is not recommended for cutting oils or as an anti-oxidant in paraffinic waxes used for food wrappers.

Packaged in Non-returnable fibre drums lined with polyethylene. Packed 100#'s and 225#'s each. Special packing available.

070173

Ref. 29

Att. E, p. 2

017-567-0600

☐ 111 Smith Street, E. Providence, R.I. 02915
401-433-3100

COASTAL SERVICES, INC.
22 River Street
Braintree, Mass. 02184

201-355-8880/8881

☐ 85 Riverview Avenue, Paulsboro, N.J. 08066
609-423-2700

8/12/76

JIM MILLER
516-473-9132

JOB REPORT JOB NO. N7579-8-76

Customer MARINE POLLUTION CONTROL

Billing Address

Location of Work BARRETT SUB STATION - OCEAN SIDE N.Y.

Job Description

SUCKING OIL FROM DIKE + TRANSPORT TO ELIZ N.J.

Date Started 8/12/76 Date Completed

Extra Work Involved (if any)

Materials

Equipment

1 6,000 GAL VAC TRUCK t/T

Names (Men On Job)	Total Hours	Names (Men On Job)	Total Hours
W. ANDERSON	10½		

Ref. 2Ø

Att. F, p.1

000652

Number of Disposal Loads (Gals.) 6000 Gals

Foreman ANDERSON

Chris Scheier MPC

Date 8-14-76

EDGEBORO DISPOSAL INC.
PHONE (201) 254-7676
59 EDGEBORO ROAD EAST BRUNSWICK, N.J. 08816
STATE APPROVED DISPOSAL AREA

DATE 12-26 1977

NAME Coastal Service

DESTINATION

QUAN.	DESCRIPTION	AMOUNT
	YARDS PACKER	
15	CONT. SOIL YARDS OPEN	
	YARDS BULK	
	2758 PF	
	26	

TIME 1240

X [signature]

C 270881

GUESTOUER'S SIGNATURE

WHITE BROTHERS TRUCKING CO
210 East 11th Avenue
Roselle, New Jersey 42

DATE 12-26

TO Coastal Service

ADDRESS Eliz yard
Eliz N.J.

1 - 10 yd. Sludge box
1 - #YLG 29W
Edgeboro
TANK FARM
MANIFEST
26068

[signature]

SOUD WASTE REMOVAL CONTRACTORS

A200825

Att. G, p.1

Ref. 29

Form VHW-001
1/81

E

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOLID WASTE ADMINISTRATION
SPECIAL WASTE MANIFEST

A -26068

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number ____ Pick-Up Date 12/26/78 (MO. DAY YR.)
Company Name Coastal Services, INC.
Pick-Up Address 932 South Front Street, Elizabeth, N.J. 07202
Name of Hauler White Bros. Trucking Address 210 E. 11th Ave. Roselle, N.J.
Name of Facility Zacoboro Disposal Address Zobeboro Rd. E.Brunnwick, N.J.

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

Handling Instructions:

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO BE COMPLETED BY THE SPECIAL WASTE FACILITY OPERATOR: Rejected Amount
1.	Acid Solution						
2.	Alkaline Solution						
3.	Anenic Residues						
4.	Catalyst Residue						
5.	Cyanide Residues						
6.	Chlorinated (Dioxin, Furan) Residues						
7.	Etching, Pickling, & Plating Residua						
S.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic and Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and OS Sludges, Emubiont						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Pharmaceutical Wastes (Drugs, etc.)						
19.	Lacramaton, Amines, Heresptans, Ankle						
20.	Plasticiser, Resin, Monomer, Elastomet Residues						
21.	PCB,PBB Contaminated Matetisls						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.	Oily Sludge Debris	1	S	I	20 yes.	P	
28.							
29.							
30.							

I certify that the above information is correct to the best of my knowledge.
Date 12/26/78 Signature and Title Dennis Ayr

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

I certify that the described quantity of material (s) listed in Section I was collected by me.
Date 12/26/7 Signature ____ Vehicle License Plate Number State ____ Number ____

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler White Bros. Trucking Address 210 E. 11th Ave. Roselle.
I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I
Date 12/26/7 Signature ____ Vehicle License Plate Number ____

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Facility ____ Address ____
Registration Number ____ Date Waste Received ____ ☐ Accepted ☐ Rejected
I certify that the hauler stated above delivered the waste described in Section I to this Facility.
Date ____ Signature and Title ____

Att. G, p.2

A200826

00021

Ref. 21

EDGEBORO DISPOSAL INC.
PHONE (201) 254-7676
39 EDGEBORO ROAD EAST BRUNSWICK, N.J. 08816
STATE APPROVED DISPOSAL AREA

DATE 12-26 1978

NAME Coastal Service

DESTINATION

QUAN.	DESCRIPTION	AMOUNT
	YARDS PACKER	
15	CONT SOIL YARDS OPEN	
	YARDS BULK	
	2758AF	
	26	
TIME 255		

X

C 270932

CUSTOMER'S SIGNATURE

WHITE BROTHERS TRUCKING CO
210 East 11th Avenue
Roselle, New Jersey
411

DATE 12-26

TO Coastal Service

ADDRESS Front St (Truck F
Eliz.

1	15 yd box		
	Dump		
	Edgeboro		
	MANIFEST		
	26067		
	DHG		
	9 yds B		

SOLID WASTE REMOVAL CONTRACTORS

A200827

Ref. 29

Att. G, p. 3

Form VHW-001
1/71

E

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOLID WASTE ADMINISTRATION

SPECIAL WASTE MANIFEST

A 26067

SECTION I TO BE COMPLETED BY THE SPECIAL WASTE GENERATOR

Plant Identification Number _____ Pick-Up Date 1 2 / 2 6 / 7 5 (MO. DAY YR.)

Company Name COASTAL SERVICES INC

Pick-Up Address 632 S. FRONT ST ELIZABETH NJ 07202

Name of Hauler WHITE BRUTHER TRUCKING Address 210 11th AVE [illegible] NJ

Name of Facility EDGEBRO DISPOSAL Address EDGEBROOD [illegible] BRUNSWICK

Handling Instructions:

Emergency Spill Phone Nos.: 609-292-5560 or 609-292-7172

	Waste Type	Number of Containers	Physical State	Hazard ID.	Total Quantity (Identify units in pounds or gallons use P for pounds and G for gallons)	Pounds or Gallons	SECTION V TO COMPLETED B THE SPECIAL WASTE FACILI OPERATOR: Rejected Amount
1.	Acid Solution						
2.	Alkaline Solution						
3.	Arsenic Residues						
4.	Catalyst Residues						
5.	Cyanide ResMues						
6.	Chlorinated (Dioxin, Fursn) Residues						
7.	Etching, Pickilng, & Plating Residue						
8.	Explosive Residue						
9.	Filter Clays, Filter Aids						
10.	Ester, Alcohol, Ether, Ketone, Glycol Residues						
11.	Heavy Metal Residue						
12.	Organic tnd Heavy Metal Residue Mixture						
13.	Latex Residue						
14.	Peroxide						
15.	Oil and Oil Sludges, Emubkins						
16.	Paint and Pigment Residues						
17.	Pesticides						
18.	Phamatceutical Wastes (Drugs, etc.)						
19.	Lacramators, Amines, Mercaptans, Amide						
20.	Plasticizer, Resin, Monomer, Elastomer Residues						
21.	PCB,PBB Contaminated Materials						
22.	Solvent, Halogenated Organic						
23.	Solvent, Mixed						
24.	Still Bottoms						
25.	Radioactive Residue						
26.	Tetraethyl Lead Residues						
	Other (See Instructions)						
27.	OILY SAND & DEBRIS	1	S	J	15 YARD	[illegible]	
28.							
29.							
30.							

I certify that the above infonnation is correct to the best of my knowledge.

Date 12/26/75 Signature and Title [illegible]

SECTION II TO BE COMPLETED BY THE SPECIAL WASTE HAULER

I certify that the described quantity of material (s) listed in Section I was collected by me.

Date 12/26/75 Signature [illegible] Vehicle License Plate Number State [illegible] Number [illegible]

SECTION III TO BE COMPLETED BY THE SPECIAL WASTE HAULER

Name of Hauler: WHITE BRUTHER TRUCKING Address [illegible] NJ

I certify that the described quantity of material (s) listed in Section I was hauled by me to the Special Waste Facility named in Section I

Date 12/26/75 Signature [illegible] Vehicle License Plate Number [illegible]

SECTION IV TO BE COMPLETED BY THE SPECIAL WASTE FACILITY

Name of Faciiity _____ Address _____

Registration Number _____ Date Waste Received __/__/__ ☐ Accepted ☐ Rejected

I certify that the hauler stated above delivered the waste described in Section I to this Facility.

Date _____ Signature and Title _____

A200828

Ref 29

(Att. G, p.4)

00021

RECEIVED IN GOOD ORDER FROM

Borne Chemical Company, Inc.

NEW YORK
RECTOR 2-5070

ESTABLISHED 1874
632 South Front St.
ELIZABETH, N. J.

ELIZABETH
FLANDERS 1-1717

Via J & S TRUCKING - COLLECT -

Date APRIL 16, 1974

Deliver to EXXON CHEMICAL C. U.S.A.
LINDEN, N.J

	Drums	2200 LBS NET EA
	Half Drums	
	Bbls	
	Hall Bbls	
	Cons	
18	PINS - ZINC OXIDE -	
	Coses	
	Pails	48600 Gr Lb
	Steel Kegs	

IMPORTANT
Deliver no empties to drivers without our signed order.
See that count is correct and take receipt.

1

Sign here

Per

18

Ref 21

Att. H, p.1

FROM

BORNE CHEMICAL COMPANY, INC.
632 South Front Street
Elizabeth, New Jersey 07207

004394

VIA Sy D INDUSTRIES.

DATE	YOUR NO.	OUR NO.
Oct. 5, 1978		

DELIVERED TO
CASSIDY CHEMICAL Co.

✓	QUANTITY	NO.	DESCRIPTION
	6	DRUMS	ACETONE.
			Richard F Olarera
			(6) DRUMS ACETONE

NO. PACKAGES	WEIGHT

RECEIVED IN GOOD ORDER BY
X

FORM 1620 REGENT FORMS, BELLMAWR, N.J. 08030

Ref. 39

Att. H, p. 2

004398

BORNE CHEMICAL COMPANY, INC.
632 South Front Street
Elizabeth, New Jersey 07207

VIA BERG-CHEM-TRUCK-FOR STAR CHEM

DATE	YOUR NO.	OUR NO.
NOV. 17, 1978		

DELIVERED TO
CASSIDY CHEMICAL CO.

✓	QUANTITY	NO.	DESCRIPTION
	22	DRUMS	M.E.K
	NO. PACKAGES	WEIGHT	

RECEIVED IN GOOD ORDER BY
X

FORM 16701 REGENT FORMS BELLMAWR N.J. 08031

Att. H, p.3

Ref. 29

FROM

BORNE CHEMICAL COMPANY, INC.
632 South Front Street
Elizabeth, New Jersey 07207

004391

VIA Super Service.

DATE	YOUR NO.	OUR NO.
Nov. 20, 1978		

DELIVERED TO Cassidy Chemical

✓	QUANTITY	NO.	DESCRIPTION
	110		Drums - Methanol
			(10)
			11/20/78
			S. Barnett
			One Drum only half full
	NO. PACKAGES	WEIGHT	

RECEIVED IN GOOD ORDER BY
X

FORM 16203 REGENT FORMS BELLMAWR N.J. 08031

Att. H, p. 4

Ref. 24

FROM

004417

BORNE CHEMICAL COMPANY, INC.

632 South Front Street

Elizabeth, New Jersey 07207

VIA LINEMARKER TRUCK.

DATE	YOUR NO.	OUR NO.
OCT. 17, 1979		

DELIVERED TO

CASSIDY CHEMICAL CO.

✓	QUANTITY	NO.	DESCRIPTION
	5	DRUMS	TOLUENE.
	NO. PACKAGES	WEIGHT	

AUTHORIZED
Dmatto
10-17-79

RECEIVED IN GOOD ORDER BY

X R. Vanderkle

FORM 1620 REGENT FORMS BELLMAWR N.J. 08031

AHH, p.5

Ref-21

REFERENCE NO. 22

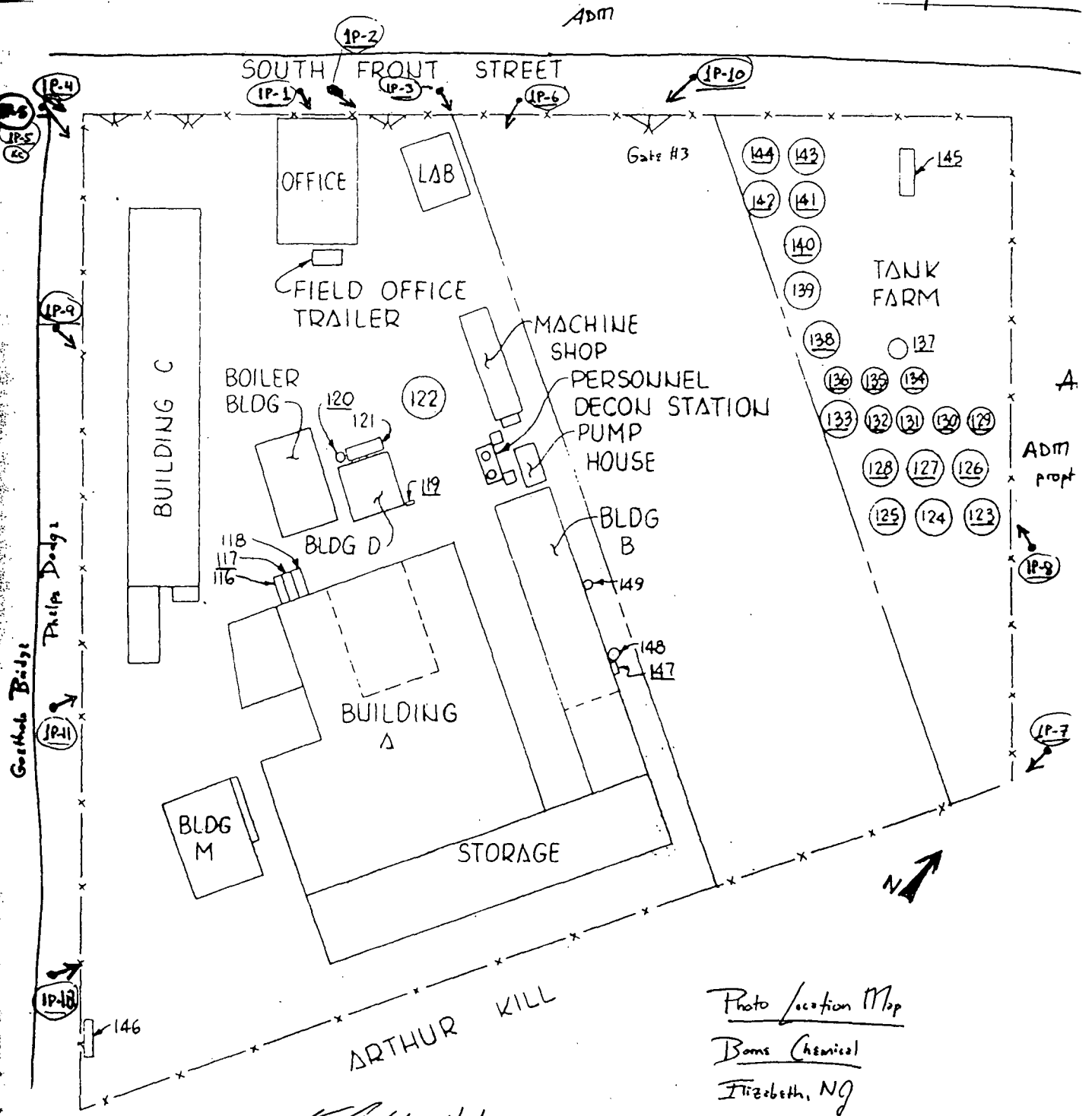


Photo Location Map
Borns Chemical
Elizabeth, NJ
February 13, 1997

K. Cyrbell 02/28/97

START-02-152

Borne Chemical Company
Elizabeth, NJ

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Suite 201, 1090 King Georges Post Road
Edison, NJ 08837

(908) 225-6116

National® Brand	ACCOUNT BOOKS	9⅝ x 6¼"
Green Book Cloth		
Item No.	Numbered Pages	Ruling
Item No. 56-521	200	Record
Item No. 56-522	"	Journal

AVERY DENNISON — Office Products

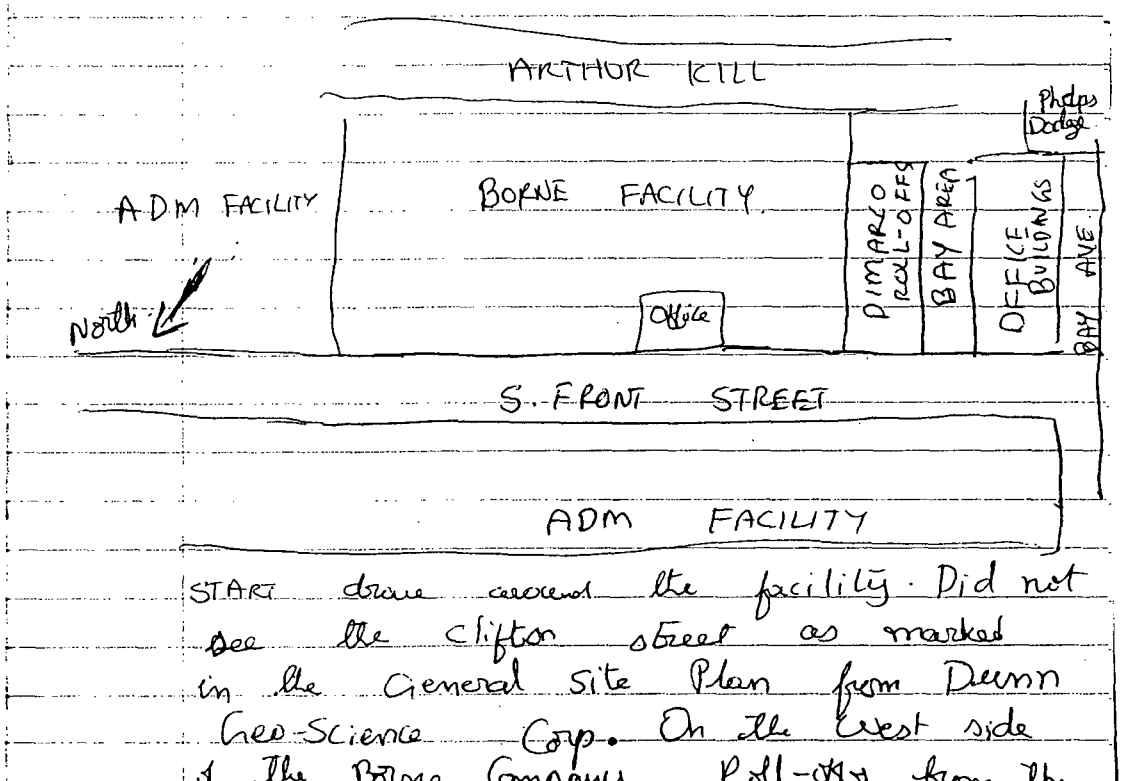
Made in USA — Chicopee, MA 01022

Product Guarantee

Avery is committed to providing you with quality products, and will gladly replace any product which does not provide complete satisfaction. We also welcome your comments and suggestions. Please send your correspondence with product code to:

Avery Division, Consumer Service Center
P.O. Box 5244
Diamond Bar, CA 91765-4000

February 13, 1997 Thursday
1500: START Ketha left office for the Borne Chemical Company site.
1545: START arrived on site.
Weather: Cloudy, low winds, Temp 25° F.
1600: START Ketha began taking pictures of the site conditions. The site is fenced with a 5-6ft high chain link fence and 3-strands of barbed wire.



START drove around the facility. Did not see the Clifton street as marked in the General Site Plan from Dunn Geo-Science Corp. On the west side of the Borne Company Roll-offs from the DiMarco company were placed right against the fence making it difficult for START to take clear pictures.
Picture #1 taken of the office building facing south on Front street
Picture #2 taken of the office building viewing

North-East from S. Front Street
Picture #3 taken of the building with the Camera facing south from Front Street.
Picture 4: View of the Fence between Borne Companies and DiMarco
Picture 5: View of the Building 'C' area and the fence line between Borne and DiMarco.
Picture 6: View of tank #122 with Camera facing south from Front Street
Picture 7 and 8: View of Arthur Hill and the South East corner of the Borne Facility - Picture taken from the ADM facility.
Picture 9: View of the former tank farm area. Picture taken from ADM facility with Camera facing North west.
Picture 10: View of Bldg. C from DiMarco Facility.
Picture 11,12: View of the south side building from the DiMarco facility
START began taking pictures with another Camera.
Picture 1: View of Crate #3 as marked on the General site Plan.
Picture #2: View of tank #122.
#3 & #4: View of Buildings on the south side of the facility.
#5: View of Building C.
#6: View of Building marked Coastal Services warehouse and workshop.
1715: START drove around the Borne Facility. The fence is secure

and all the gates were locked. START found 4 storm drains close to the facility on the west side of Front Street. The ADM facility which borders on the East of Borne Company is also located accross the Front Street from Borne Company. The glass windows on the office building are (KS) all shattered.

1730: START left site for office

Swamy S. Kelli

* Photos as they appear in SIP Report.

BORNE CHEMICAL COMPANY
ELIZABETH, NEW JERSEY
FEBRUARY 13, 1997

ALL PHOTOGRAPHS TAKEN BY S. KETHA

PHOTO NUMBER	DESCRIPTION
1P-1	View looking southeast at Office Building, from South Front Street.
1P-2	View looking northeast at Office Building, with Laboratory Building in background.
1P-3	View looking east at Machine Shop and Building B (Grease Building), with Laboratory Building to right.
1P-4	View looking northeast at southern site fence and adjacent Phelps Dodge property.
1P-5	View looking east at southern site fence, with Goethals Bridge on the right.
1P-6	View looking south at Aboveground Storage Tank No. 122, with Building B to the left.
1P-7	View looking south at the Arthur Kill and the northeast corner of the site.
1P-8	View looking northwest at former Tank Farm Area, from northern perimeter of site.
1P-9	View looking southeast at Building C, from southern property line.
1P-10	View looking south from South Front Street at facility's Gate #3.
1P-11	View looking northeast at eastern end of Building C (Coopers Shed) and western end of Building A (Blending Building).
1P-12	View looking northeast at Building M (Storage Building).

Note: All photographs were taken from 1600 to 1715 hours.

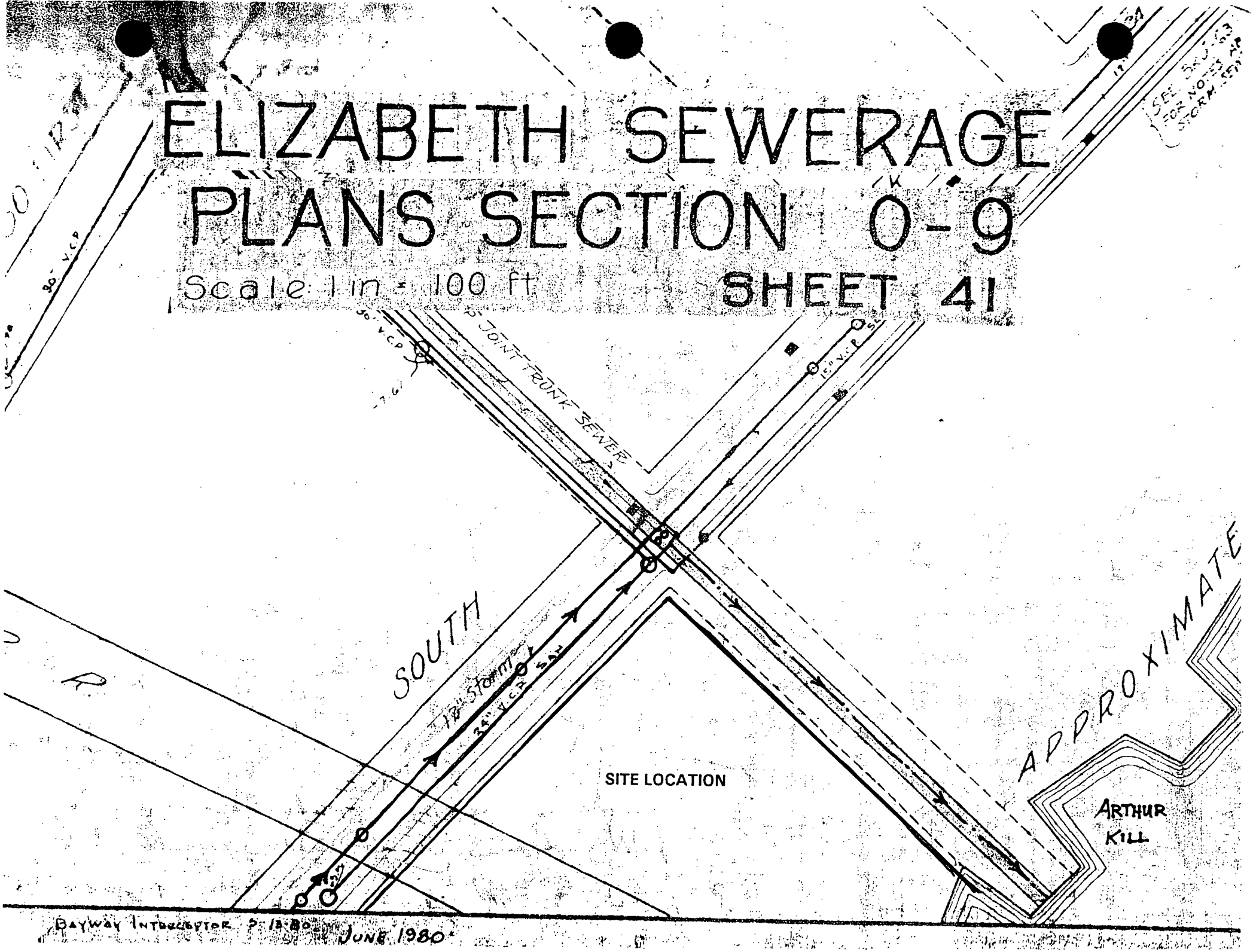
K. Gold 02/25/97

REFERENCE NO. 23

ELIZABETH SEWERAGE PLANS SECTION 0-9

Scale 1 in = 100 ft

SHEET 41



REFERENCE NO. 24

SEDIMENTOLOGY OF NEWARK BAY, NEW JERSEY:

AN URBAN ESTUARINE BAY

BY

Dennis John Suszkowski

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Marine Studies.

Ref. 24 p.1 June, 1978

composed of fine sand, silt and clay (Schuberth, 1968). The sea level eventually rose high enough from the melting ice to breach the terminal morraine and flood Lake Hackensack. As the glaciers finally wasted away, the lands beneath it were uplifted, the streams were rejuvenated and deposited gravel, sand, and coarse silt over the varved clay beds (Schuberth, 1968). Recent sediments in Newark Bay overlie the post glacial outwash deposits.

C. Waterway Usage

Newark Bay is situated in one of the most industrialized and populated areas in the eastern United States. The New York Metropolitan region has a population of over 14 million people. Principal manufactured products in the Newark Bay area are textiles, chemicals rubber products, electrical machinery and supplies. Petroleum products and building materials, brought to che waterfront terminals by vessel, are distributed throughout the area. Newark Bay and the Hackensack and Passaic Rivers are used by a variety of commercial and recreational vessels. The commercial deep-draft vessels include oil tankers and general cargo vessels, many of which are containerized cargo vessels having drafts in excess of 10 meters, lengths of over 250 meters, and beam widths greater than 30 meters. At Port Newark and Port Elizabeth, the Port of New York Authority maintains two of the largest marine transfer facilities in the world. Shallow draft vessels utilizing Newark Bay include all types of recreational vessels, barges and

Ref. 24

p. 2

tugs. In che Kill Van Kull, Newark Bay, and the Hackensack and Passaic Rivers, the U.S. Army Corps of Engineers maincains approximately 35 kilometers of navigation channels

Since the Newark Bay region is extremely populated and heavily industrialized, it has only been natural that the waters of this region be used for industrial and municipal waste disposal. Leighton (1902) stated that the nacural resources of the Passaic River were severely damaged due to wacer pollucion 75 years ago. Suszkowski (1973) showed that dissolved oxygen levels in all sections of New York Harbor declined dramatically at the turn of the century due to the increased organic loadings of a growing populous. Mueller et al.(1976) indicate that at present, Newark Bay and the Hackensack and Passaic Rivers receive discharges of domestic and industrial wastewater amounting to 6.6 m^3/sec. This is approximacely 13% of the total fresh water input into Newark Bay.

Ref. 24

REFERENCE NO. 25

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Borne Chemical file

DATE: 02/14/97

FROM: K. Campbell

SUBJECT: Wetlands in Site Vicinity

REFERENCE: The following wetland frontage and acreage were determined using the Fifteen Mile Surface Migration Limit Map for this Report:

Surface Water Pathway

Water Body	Frontage (Acres)
Arthur Kill	56
Newark Bay	7
Passaic River	0
Hackensack River	2
Kill Van Kull	0
Upper New York Bay	14
Hudson River	0
The Narrows	0
Lower New York Bay	2
Raritan Bay	0

Air Pathway

Distance Ring (mi)	Acreage
0-1/4	3
1/4-1/2	70
½-1	123
1-2	405
2-3	584
3-4	620

Rd. 25

REFERENCE NO. 26

SURFACE WATER MIGRATION LIMIT
APPROXIMATE LOCATION SENSITIVE ENVIRONMENT STATE-LISTED THREATENED SPECIES
APPROXIMATE LOCATION SENSITIVE ENVIRONMENT UNIQUE BIOTIC COMMUNITY
APPROXIMATE LOCATION SENSITIVE ENVIRONMENT STATE-LISTED ENDANGERED SPECIES
APPROXIMATE LOCATION SENSITIVE ENVIRONMENT FEDERALLY-LISTED ENDANGERED SPECIES
PROBABLE POINT OF ENTRY
SITE LOCATION
SCALE 1:24 000
Roy F. Weston, Inc.
FEDERAL PROGRAMS DIVISION
IN ASSOCIATION WITH RESOURCE APPLICATIONS, INC.
C.C. JOHNSON & MALMOTRA, P.C., R.E. BARNEBA ASSOCIATES,
PRC ENVIRONMENTAL MANAGEMENT, AND GRB ENVIRONMENTAL SERVICES, INC.
QUAD: Elizabeth, NJ
TITLE: Fifteen Mile Surface Water Migration Limit Map
SITE NAME: Borne Chemical Company
SCALE: 1" : 2,000'
TDD#: 02-96-03-0020
DATE: 25 February 1997
WETLAND LEGEND
U – Primarily represents upland areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.
ECOLOGICAL SYSTEM
E – ESTUARINE
P – PALUSTRINE
R – RIVERINE
Great Kills
Crooks Point
Segeme Point
Round Shoal
Old Orchard Shoal Lighthouse
Raritan Bay
Lower Bay
The Narrows
Upper Bay
Newark Bay
Kill Van Kull
Newark Airport
Staten Island Ferry Place
U.S. Coast Guard Station
U.S. Quarantine Station
U.S. Naval Reservation
U.S. Military Reservation
Bayonne Bridge
Verrazano Bridge
Goethals Bridge
Outerbridge Crossing
Holland Tunnel
Lincoln Tunnel
Hudson Co.
Richmond Co.
Monmouth Co.
New York City
New York Bay
New York Harbor
New Jersey
Elizabeth
Newark
Bayonne
Staten Island
Linden
Rahway
Perth Amboy
Keyport
Sandy Hook
Highlands
Atlantic Ocean

SURFACE WATER MIGRATION LIMIT
APPROXIMATE LOCATION SENSITIVE ENVIRONMENT - STATE-LISTED THREATENED SPECIES
APPROXIMATE LOCATION SENSITIVE ENVIRONMENT - UNIQUE BIOTIC COMMUNITY
APPROXIMATE LOCATION SENSITIVE ENVIRONMENT - STATE-LISTED ENDANGERED SPECIES
APPROXIMATE LOCATION SENSITIVE ENVIRONMENT - FEDERALLY-LISTED ENDANGERED SPECIES
PROBABLE POINT OF ENTRY
SITE LOCATION
SURFACE WATER MIGRATION LIMIT
NEWARK
NEWARK AIRPORT
JERSEY CITY
HOBOKEN
BAYONNE
KEARNY
HARRISON
ELIZABETH
LINDEN
ROSELLE
ELMORA
STATEN ISLAND
UPPER BAY
LOWER BAY
THE NARROWS
Ellis Island
Liberty Island
Governors Island
Roy F. Weston, Inc.
FEDERAL PROGRAMS DIVISION
IN ASSOCIATION WITH RESOURCE APPLICATION, INC.
C.C. JOHNSON & MALHOTRA, P.C., R.E. SARRIERA ASSOCIATES,
PRC ENVIRONMENTAL MANAGEMENT, AND GRB ENVIRONMENTAL SERVICES, INC.
QUAD: Elizabeth, NJ
TITLE: Fifteen Mile Surface Water Migration Limit Map
SITE NAME: Borne Chemical Company
SCALE: 1": 2,000'
TDD#: 02-96-03-0020
DATE: 25 February 1997
1:24 000
1 MILE
1 KILOMETER

REFERENCE NO. 27

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

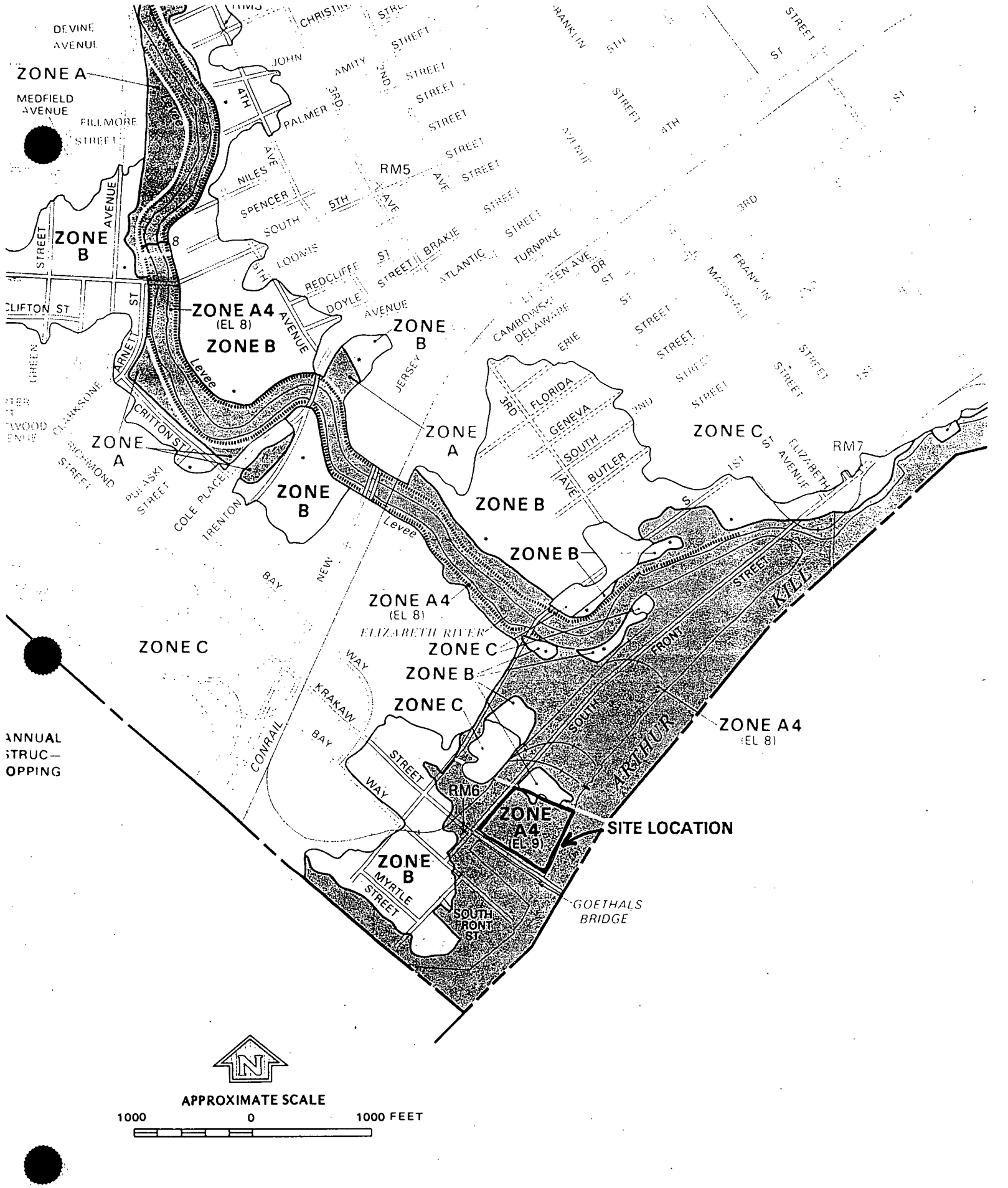
CITY OF
ELIZABETH, NEW JERSEY
UNION COUNTY

(ONLY PANEL PRINTED)

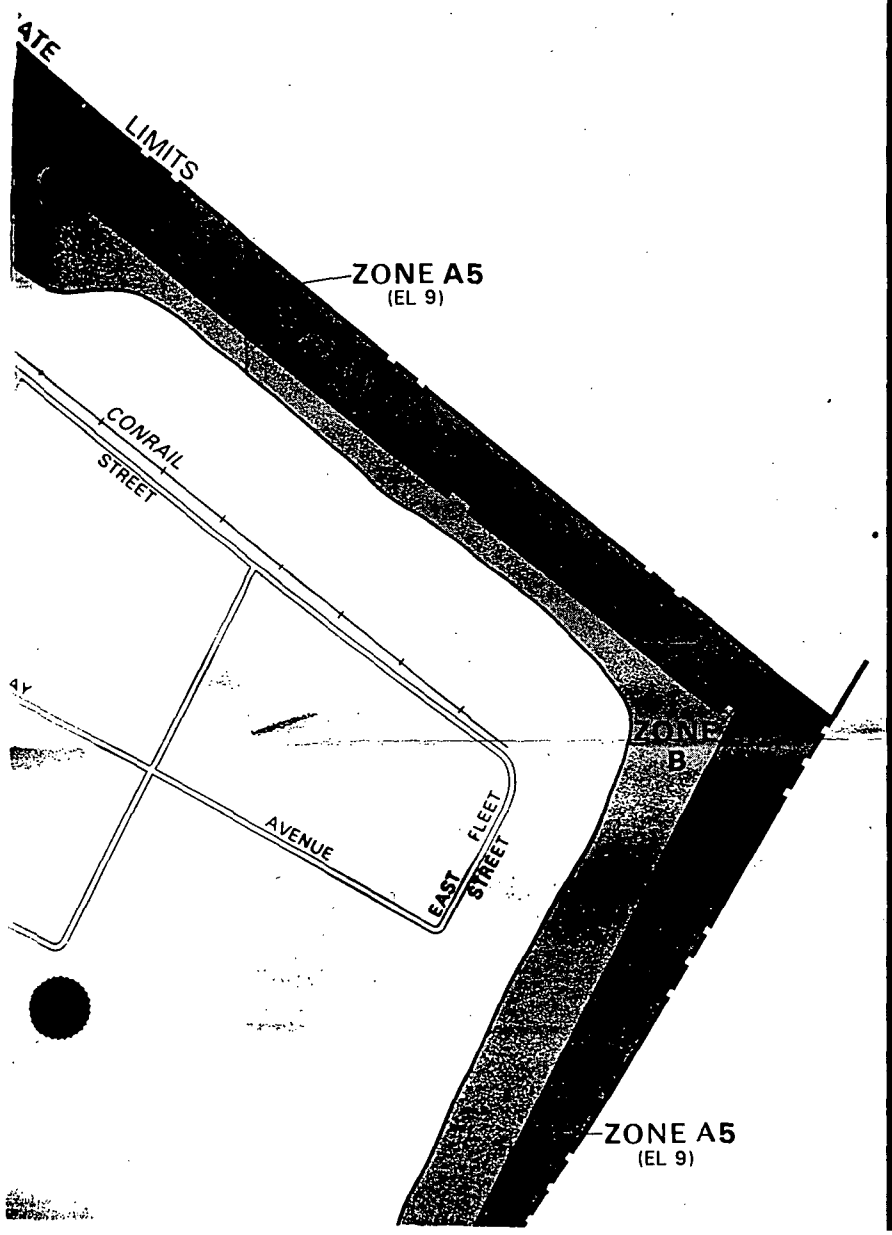
COMMUNITY-PANEL NUMBER
345523 0005 E

MAP REVISED:
NOVEMBER 1, 1985

Federal Emergency Management Agency



DEVINE AVENUE
ZONE A
MEDFIELD AVENUE
FILLMORE STREET
ZONE B
CLIFTON ST
ZONE A4 (EL 8)
ZONE B
ZONE B
ZONE A
ZONE A
ZONE B
ZONE B
ZONE C
ZONE C
ZONE A4 (EL 8)
ELIZABETH RIVER
ZONE C
ZONE B
ZONE C
ZONE A4 (EL 8)
ZONE A4 (EL 9)
SITE LOCATION
ZONE B
RM5
RM6
RM7
Levee
ARTHUR KILL
SOUTH FRONT ST
GOETHALS BRIDGE
CONRAIL
KRAKAW BAY
MYRTLE STREET
ANNUAL STRUC— OPPING
APPROXIMATE SCALE
1000
0
1000 FEET



KEY TO MAP

500-Year Flood Boundary	
100-Year Flood Boundary	
Zone Designations*	ZONE B / ZONE B
100-Year Flood Boundary	
500-Year Flood Boundary	
Base Flood Elevation Line With Elevation In Feet**	513
Base Flood Elevation in Feet Where Uniform Within Zone**	(EL 987)
Elevation Reference Mark	RM7×
Zone D Boundary	
River Mile	•M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

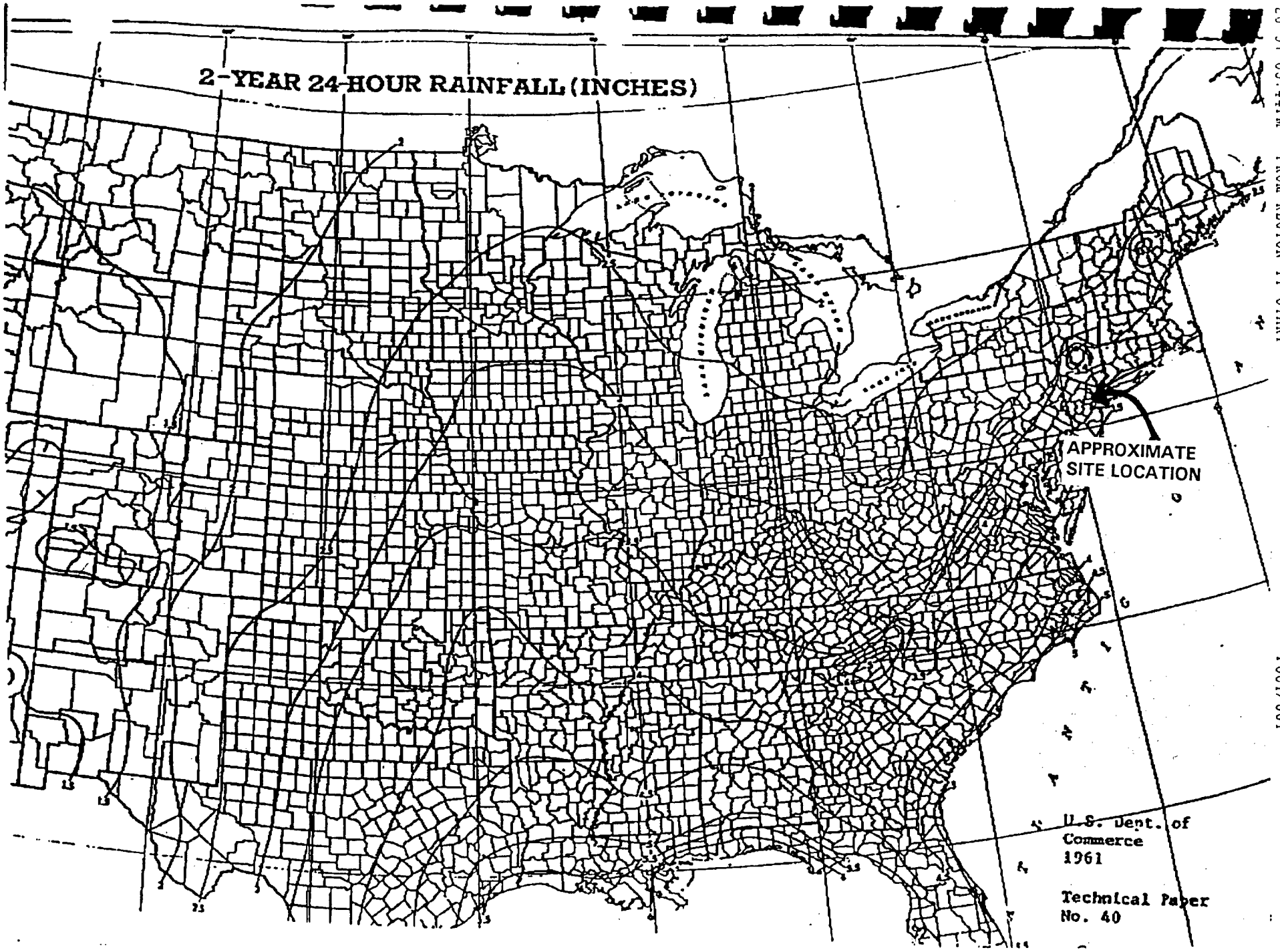
This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

INITIAL IDENTIFICATION:
MAY 22, 1970
MAY 8, 1971

FLOOD HAZARD BOUNDARY MAP REVISIONS:

JULY 1, 1974

REFERENCE NO. 28


2-YEAR 24-HOUR RAINFALL (INCHES)
APPROXIMATE SITE LOCATION
U.S. Dept. of Commerce 1961
Technical Paper No. 40

REFERENCE NO. 29

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Borne Chemical file

DATE: 02/14/97

FROM: K. Campbell

SUBJECT: Sensitive Environments

REFERENCE

Our office received information regarding sensitive environments in the site vicinity from the NJ Natural Heritage Program (NHP). As the NHP data are sensitive in nature, the original NHP letter is filed in the "Confidential" subsection of this TDD file and a general summary of the NHP information is provided below:

Sensitive Environment	Approximate Distance from Site*
▪ Federally-listed endangered species habitat	2.5 miles
(*Falco peregrinus*)	
▪ State-listed endangered species	5 miles
(*Sterna antillarum*)	
▪ State-listed endangered species	9 miles
(*Lemna perpusilla*)	
▪ State-listed threatened species	14 miles
(*Passerculus sandwichensis*)	
▪ Unique Biotic Community	6 miles
Coastal Heron Rookery	

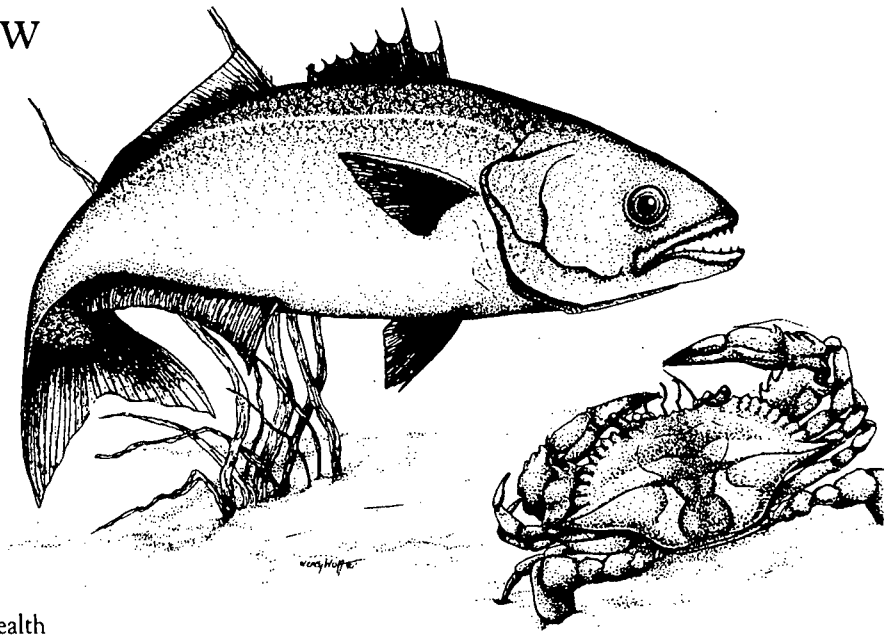
* Estimated Values.

Ref. 29

REFERENCE NO. 30

A GUIDE TO HEALTH ADVISORIES FOR EATING FISH AND CRABS CAUGHT IN NEW JERSEY WATERS

What you need to know about recreational fishing and crabbing



March 1995 Edition

Christine Todd Whitman, Governor

Robert C. Shinn, Jr., Commissioner
New Jersey Department of Environmental Protection

Len Fishman, Commissioner, New Jersey Department of Health

Pef 30

p-1

Fish and Crab Advisories Based on PCB, Dioxin and Chlordane Contamination

Location	Species	Advisory/Prohibition	
New Jersey Statewide		General Population	High Risk Individual [1]
Note: local advisories may be more specific for the same species. See below.	American eel	do not eat more than once a week	do not eat
	bluefish (over 6 lbs.)	do not eat more than once a week	do not eat
	striped bass *	consumption advisories vary by area; see below	consumption advisories vary by area; see below
Newark Bay Complex			
This complex includes Newark Bay, Hackensack River downstream of Oradell Dam, Arthur Kill, Kill Van Kull, tidal portions of all rivers and streams that feed into these water bodies and	striped bass *	do not eat	do not eat
	American eel *	do not eat more than once a week	do not eat
	blue crab *	do not eat or harvest [2]	do not eat or harvest [2]
	bluefish (over 6 lbs.), white perch and white catfish	do not eat more than once a week	do not eat
Passaic River downstream of Dundee Dam and streams that feed into this section of the river.	all fish and shellfish *	do not eat	do not eat
	blue crab *	do not eat or harvest [2]	do not eat or harvest [2]
Hudson River			
Hudson River includes the river downstream of NY-NJ border (about 4 miles above Alpine, NJ) and Upper New York Bay.	American eel *	do not eat more than once a week	do not eat
	striped bass *	do not eat more than once a week	do not eat
	bluefish (over 6 lbs.), white perch and white catfish	do not eat more than once a week	do not eat
	blue crab	do not eat green gland (hepatopancreas) [3]	do not eat green gland (hepatopancreas) [3]
Raritan Bay Complex			
This complex includes the New Jersey portions of Sandy Hook and Raritan bays, the tidal portions of the Raritan River (downstream of the Rte. 1 bridge in New Brunswick) and the tidal portions of all rivers and streams that feed into these water bodies.	striped bass *	do not eat more than once a week	do not eat
	bluefish (over 6 lbs.), white perch and white catfish	do not eat more than once a week	do not eat
	blue crab	do not eat green gland (hepatopancreas) [3]	do not eat green gland (hepatopancreas) [3]

Ref. 20

Northern Coastal Waters			
This area includes all coastal waters from Raritan Bay south to the Barnegat Inlet.	striped bass *	do not eat more than once a week	do not eat
Camden Area See additional advisories on page 3.			
This area includes Strawbridge Lake, Pennsauken Creek (north and south branches), Cooper River and its drainage, Cooper River Lake, Stewart Lake and Newton Lake.	all fish, shellfish and crustaceans *	do not eat	do not eat
Lower Delaware River & Bay NJ is honoring DE and PA advisories. See additional advisories on page 3.			
Delaware River from Yardley, PA to the PA/DE border	American eel	do not eat	do not eat
Delaware River from Yardley, PA (across from Ewing Twp., NJ) south to the Chesapeake and Delaware Canal	channel catfish * white catfish white perch	do not eat	do not eat
Lower Delaware River includes the river between the PA Turnpike Bridge (I-276 bridge) in Burlington Twp. (Burlington County) and Birch Creek in Logan Twp. (Gloucester County) about 2 miles below Commodore Barry Bridge.	channel catfish *	do not eat	do not eat
Delaware River from the DE/PA border south to the Delaware and Chesapeake Canal	striped bass *	do not eat	do not eat
Delaware River from the Chesapeake and Delaware Canal (across from Salem, NJ) south to mouth of the Delaware Bay	striped bass * channel catfish white catfish	do not eat more than five 8-ounce meals per year	do not eat more than three 4-ounce meals per year *Note: This portion size differs from others listed in this brochure.*

* Selling any of these species from designated water bodies is prohibited in New Jersey.

1 High risk individuals include: infants, children under the age of 15, pregnant women, nursing mothers and women of childbearing age. They are advised not to eat any such fish or crabs taken from the designated regions since these contaminants have a greater impact on the developing young.

2 No harvest means no taking or attempting to take any blue crabs from these waters.

3 Interim recommendation based on research showing elevated levels of chemical contaminants in the blue crab hepatopancreas, also called the green gland.

Ref. 30

REFERENCE NO. 31

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
02-96-03-0020	03/07/97	1025

DISTRIBUTION:
Bome Chemical file

BETWEEN:	OF	PHONE
Receptionist	ADM	(908) 354-2211

AND
K. Campbell (100)

DISCUSSION

I telephoned the **ADM** facilty to inquire about the number of employees. The receptionist stated that there are 8 people employed at the facility. (The address of **ADM** is: 554 South Front Street, Elizabeth, NJ.)

ACTION ITEMS:

REFERENCE NO. 32

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Burns Chemical file **DATE:** 02/14/97

FROM: K. Campbell **COPIES:**

SUBJECT: Population Within Four Miles of Site

REFERENCE:

The following data is collated from two letters from Frost Associates to Dennis Foerter (dated April 29, 1996; attached). As the four-mile radius extends into the State of New York, two population data searches were conducted; these results are combined below:

Distance Ring (mi)	Population - NJ	+	Population - NY	=	Total Population In Ring	(Rounded to nearest ten.)
0 - 1/4	284		0		284	280
> 1/4 - 1/2	1,667		28		1,695	1,700
> 1/2 - 1	18,551		180		18,731	18,730
> 1 - 2	44,295		4,722		49,017	49,020
> 2 - 3	71,281		27,951		99,232	99,230
> 3 - 4	77,212		41,239		118,451	118,450

Four-Mile / Total Population = 287,410

One-Mile / Total Population = 20,710

K. Campbell 02/14/97

Ref 32

FROST ASSOCIATES

P.O. Box 495, Essex, Connecticut 06426
(860) 767-7644 FAX (860) 767-1971

April 29, 1996

To: Roy F. Weston Inc
1090 King Georges Post Road, Suite 201
Edison, New Jersey 08837

Attn: Dennis Foerter

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Elizabeth / Union, NJ

Job: 1284

Site Longitude: 74-12-00 74.199997
Site Latitude : 40-38-30 40.641670

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-IA files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

A method to solve for the area of a polygon is to take one-half the sum of the pro-

ducts obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya))

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-IA files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Ref.32

Elizabeth / Union, NJ

========== Site Data ==========

Population:	213289.09
Households:	82562.26
Drilled Wells:	147.96
Dug Wells:	0.00
Other Water Sources:	55.93

========== Partial (RING) data ==========

---- Within Ring: 4 Mile(s) and 3 Mile(s) ----

Population:	77211.53
Households:	31030.54
Drilled Wells:	27.62
Dug Wells:	0.00
Other Water Sources:	6.93

** Population On Private Wells: 68.72

---- Within Ring: 3 Mile(s) and 2 Mile(s) ----

Population:	71280.68
Households:	28284.91
Drilled Wells:	44.34
Dug Wells:	0.00
Other Water Sources:	27.32

** Population On Private Wells: 111.74

---- Within Ring: 2 Mile(s) and 1 Mile(s) ----

Population:	44295.27
Households:	16069.25
Drilled Wells:	42.01
Dug Wells:	0.00
Other Water Sources:	12.68

** Population On Private Wells: 115.81

---- Within Ring: 1 Mile(s) and .5 Mile(s) ----

Population:	18551.39
Households:	6425.70
Drilled Wells:	31.03
Dug Wells:	0.00
Other Water Sources:	5.14

** Population On Private Wells: 89.59

Elizabeth / Union, NJ

---- Within Ring: .5 Mile(s) and .25 Mile(s) ----

Population:	1666.67
Households:	636.48
Drilled Wells:	2.49
Dug Wells:	0.00
Other Water Sources:	3.86

** Population On Private Wells: 6.53

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	283.55
Households:	115.37
Drilled Wells:	0.46
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: 1.14

** Total Population On Private Wells: 393.52

Ref. 32

FROST ASSOCIATES

P.O. Box 495, Essex, Connecticut 06426
(860) 767-7644 FAX (860) 767-1971

April 29, 1996

To: Roy F. Weston Inc
1090 King Georges Post Road, Suite 201
Edison, New Jersey 08837

Attn: Dennis Foerter

Fr: Frost Associates
P.O. Box 495
Essex, Conn 06426

Tel: (203) 767-1254
Fax: (203) 767-7069

Sub: Elizabeth / Union, NJ NEW YORK PORTION

CERCLIS:

Job: 1284

Site Longitude: 74-12-00 74.199997
Site Latitude : 40-38-30 40.641670

The CENTRACTS report below identifies the population, households, and private water wells of each Block Group that lies within, or partially within, the 4, 3, 2, 1, .5, and .25, mile "rings" of the latitude and longitude coordinates above. CENTRACTS may have up to ten radii of any length. 1000 block groups, and 15000 block group sides.

CENTRACTS uses the 1990 Block Group population and Block Group house count data found in the Census Bureau's 1990 STF-IA files. The sources of water supply data are from the Bureau's 1990 STF-3A files. The boundary line coordinates of the Block Groups were extracted from the Census Bureau's 1990 TIGER/Line Files.

CENTRACTS reports are created with programs written by Frost Associates, P.O. Box 495, Essex, Conn. The code was written using Microsoft's Quick-Basic Ver. 4.5.

Latitude and Longitude coordinates identifying a site are entered in degrees and decimal degrees. One or more county files holding Block Group boundary lines are selected for use by CENTRACTS by determining whether the site coordinates fall within the minimum and maximum Lat\Lon coordinates of each county in the state.

Each Block Group line segment has Lat\Lon coordinates representing the "From" and "To" ends of that line. All coordinates from the selected county files are read and converted from degrees, decimal degrees to X\Y miles from the site location. Each line segment is then examined whether it lies within or partially within the maximum ring from the site.

The unique Block Group ID numbers of each line segment that lie within the maximum ring are retained. All Block Group boundary lines matching the Block Group numbers are then extracted from the respective county files to obtain all sides of the included Block Groups. Boundary records are then sorted in adjacent side order to determine the shape and area of each Block Group polygon.

Ref. 32

A method to solve for the area of a polygon is to take one-half the sum of the products obtained by multiplying each X-coordinate by the difference between the adjacent Y-coordinates. For a polygon with coordinates at adjacent angles A, B, C, D, and E. The formula can be expressed:

Area = 1/2{Xa(Ye-Yb)+ Xb(Ya-Yb)+ Xc(Yb-Yd)+ Xd(Yc-Ye)+ Xe(Yd-Ya)}

For each ring, the selected Block Groups will be inside, outside, or intersected by the ring. When a polygon is intersected, the partial Block Group area within that ring is calculated using the method described below.

When a ring intersects a Block Group, the intersect points are solved and plotted at the points where the ring enters and exits the shape. The chord line, a line within the circle connecting the intersect points is determined. This chord line is used to calculate the segment area, the half moon shape between the chord line and the ring, and the sub-polygon created by the chord line and the Block Group boundaries that lie outside the ring.

The segment area is subtracted from the sub-polygon area to determine the area of the sub-polygon outside the ring. The area outside the ring is then subtracted from the area of the entire polygon to arrive at the inside area. This inside area is then divided by the tract's total area to determine the percentage of area within the ring. This process is repeated for each block group that is intersected by one of the rings. The total area, partial area, and percentage of partial area of those block groups within, or partially within a ring, are held in memory for the report.

On occasion, the algorithm described above is unable to determine the area of the partial area. Within the report program is a "Paint" routine which allows an enclosed shape to be highlighted. Another routine calculates the percentage of highlighted screen pixels to the pixels within the polygon. A manual entry is allowed. Both the "paint" method and manual entry method over ride the calculated method.

CENTRACTS lists, starting on page 4, all Block Groups in State, County, Census Tract, and Block Group ID order that lie within, or partially within, the maximum ring. Each Block Group is identified by a City or Town name and by the Block Group's State, County, Tract and Block Group ID number. Following is the Block Group's 1990 populu tion and house count extracted from the Census Bureau's 1990 STF-IA files.

The next four columns display water source data from the 1990 STF-3A files. The first column is "Units with Public system or private company source of water", followed by "Units with individual well, Drilled, source of water"; "Units with individual well, Dug, source of water" and "Units with Other source of water".

For each ring, CENTRACTS then shows the Block Groups that are within that ring, the Block Group's total area in square miles, the partial area of the Block Group within that ring, and the partial percentage within the ring. The areas of the included Block Group and the partial areas are then totaled.

The last section tallies the demographic data within each ring. The percentage of area for each Block Group is multiplied times the census data for that Block Group and totaled for all Block Group's within the ring. Ring totals are then determined by subtracting the three mile data from the four mile, the two mile from the three mile, one from the two, etc... Population on private wells is calculated using the formula: ((Drilled + Dug Wells) / Households) * Population

Ref-32

Site Data

Population:	74119.71
Households:	27280.54
Drilled Wells:	22.00
Dug Wells:	39.00
Other Water Sources:	17.34

Partial (RING) data

Within Ring: 4 Mile(s) and 3 Mile(s)

Population:	41239.18
Households:	15215.94
Drilled Wells:	20.48
Dug Wells:	9.59
Other Water Sources:	7.34

** Population On Private Wells: 81.50

Within Ring: 3 Mile(s) and 2 Mile(s)

Population:	27950.80
Households:	10075.54
Drilled Wells:	1.52
Dug Wells:	-0.63
Other Water Sources:	10.00

** Population On Private Wells: 2.46

Within Ring: 2 Mile(s) and 1 Mile(s)

Population:	4722.06
Households:	1874.15
Drilled Wells:	0.00
Dug Wells:	22.39
Other Water Sources:	0.00

** Population On Private Wells: 56.41

Within Ring: 1 Mile(s) and .5 Mile(s)

Population:	180.14
Households:	99.57
Drilled Wells:	0.00
Dug Wells:	6.61
Other Water Sources:	0.00

** Population On Private Wells: 11.96

---- Within Ring: .5 Mile(s) and .25 Mile(s) ----

Population:	27.53
Households:	15.34
Drilled Wells:	0.00
Dug Wells:	1.04
Other Water Sources:	0.00

** Population On Private Wells: 1.86

---- Within Ring: .25 Mile(s) and 0 Mile(s) ----

Population:	0.00
Households:	0.00
Drilled Wells:	0.00
Dug Wells:	0.00
Other Water Sources:	0.00

** Population On Private Wells: Not Applicable

** Total Population On Private Wells: 154.20

REFERENCE NO. 33

02-96-03-0020

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Borns Chemical file

DATE: 14 February 1997 (Rev. 04/28/97)

FROM: K. Campbell

COPIES:

SUBJECT: Site Latitude/Longitude

REFERENCE:

The site latitude and longitude calculations are noted below; calculations were based on the use of the USGS Quadrangle for "Elizabeth, NJ-NY."

Latitude $\frac{5.8\text{ cm}}{19.3\text{ cm}}(150'') = 45''$

Base Latitude: 40°37'30" N
+ 45"

→ Site Latitude — 40°38'15" N

Longitude $\frac{11.2\text{ cm}}{14.7\text{ cm}}(150'') = 114'' = 1'54''$

Base Longitude: 74° 10'00" W
+ 1'54"

→ Site Longitude — 74°11'54" W

[Note: These calculation results very slightly from the latitude and longitude positions provided in the August 1981 SI Report (Ref. No. 8, p. 1 of this report)].

K. Campbell 04/28/97

REFERENCE NO. 34

Form ADM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Vince Krisak DATE July 23, 1984

FROM Fred Sickels

SUBJECT Borne Chemical - Elizabeth
Rolfite Drum Removal
20-04-07

July 19, 1984

1440 - I arrive at the Borne Chemical site and inspect the area from which the Polfite Company was to remove drums containing MgO/oil mixtures.

Presently, the removal project has not been completed, however, it appears that substantial progress has been made. I observed seventy drums located under the railroad overpass which appeared to contain MgO solids. The liquid portions had been removed. The majority of these drums were one-half to three-quarters full of the solid material. The drums still had numbered red tags attached. Another 68 drums of the same material were observed in two roll off type containers which were being stored on the same location. Container CV20PP06 contained 38 drums, while container CV20PP03 contained 30 drums. A portion of the thirty eight drums in CV20PP06 were thirty gallons in size. All drums in CV20PP03 were of the fifty-five gallon variety. The drums were arranged in an orderly manner, and it appeared they were prepared for removal from site in the near future.

Three fifty-five gallon drums marked "solvent-leave alone" were also on site. These drums are in good shape and show no signs of leaking. Rolfite was instructed to leave these drums on this site until such time it is determined who is responsible for their removal. Also, alongside the tank farm, I observed four unmarked fifty-five gallon drums which contained an unknown liquid material. One drum had an opened bung, which I closed, and contained liquid with an acidic odor. The contents of the remaining three drums could not be observed. I will consult with O.R.S. prior to determining how these drums should be addressed.

Apparently, Rolfite has begun removing surface soil contamination in the drum area. I observed a backhoe and twenty-five ringtop drums filled with soil on the site. Numerous empty ringtop drums were also stacked neatly on site and appeared to be for use in further soil removal. Small areas of oil spillage still remain.

Finally, wooden pallets and crushed drums are being stored in piles on this site. I will contact Gary Kendall of Rolfite to inquire as to what will be done with these materials.

July 20, 1984

1100 - I contact Gary Kendall and ask him why all of the drums have not been moved off site. Mr. Kendall stated that tha hauler has been able to move only a few drums at a time and he expects the site to be clear of drums by the week of July 23, 1984. All empty drums will be crushed and sent to Delaware Container via closed gate container. Mr. Kendall also stated that the solvent-like material will be moved into the warehouse on the Borne Chemical Company site. Mr. Kendall will inform me when all of the drums have been removed.

CONCLUSIONS:

As I stated previously, the removal of the drums is not completed, however, Rolfite is progressing toward the desired end. The cleanup appears to be surface oriented and subsurface contamination may have to be delineated through sampling. However, it is difficult to determine exactly from where the contamination originated (i.e. - tank storage area, drums, general poor housekeeping). A sampling protocol for the entire site will, I'm sure, include the drum area. This protocol will most likely be developed by ESMA because they are presently to my understanding, the lead agency.

FOC4:dg
cc Chris Altomari - ESMA
Philip Yeamy - CRS

REFERENCE NO. 35

Jo-04-07 Sickels

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
HAZARDOUS SITE MITIGATION ADMINISTRATION
CN 028, Trenton, N.J. 08625

MARY M. SALOMONE
DIRECTOR

JORGE H. BERKOWITZ, PH.D.
ADMINISTRATOR

MEMORANDUM

31 OCT 1984

TO: Ms. Rebecca Fields
Deputy Attorney General

FROM: Mr. Anthony J. McMahon, Chief
Bureau of Industrial Site Evaluation

SUBJECT: Borne Chemical Company
Elizabeth, Union County

On September 27, 1984, a meeting was held at the Borne facility in Elizabeth to discuss potential solutions, other than court action, to the company's dilemma regarding its bankruptcy status and its desire to sell the property.

The meeting was attended by:

Mr. Frank Veccione, Attorney for Borne
Ms. Rebecca Fields, DAG
Ms. Chris Altomari, HSMA
Mr. Anthony McMahon, BISE, Chief
Mr. Bart Bennett, Attorney for Borne
Mr. Phil Yeany, Esquire, ORS
Mr. Joseph Douglass, BISE, Case Manager
unnamed employee of Borne

Mr. Veccione began the meeting with a summary of the company's history at the site. The property was purchased from the Standard Oil Company about 1912 and buildings were erected in 1914. The exact use of the property during these early years is unknown.

In 1980, Borne filed for reorganization under Chapter 11 of the bankruptcy proceedings. Apparently, an operation at some other location which involved printing had drained the corporation financially.

80 to 90% of Borne's recent operations involved blending of high quality motor and lubricating oils. According to Mr. Veccione the tank farm was not used in conjunction with the blending operations. The tanks were leased to outside parties who reportedly stored oil on-site.

Borne was required by EPA to prepare an SPCC-DPC plan for the site. The plan was prepared but never received final EPA approval, and would have cost $250,000 to implement.

In 1983, Borne attempted to sell the properties. Current operators formed a corporation (Bruncor) and an agreement was reached. The sale price was $425,000. The Bankruptcy Court approved the sale which was to have taken place in 1983; however, the sale was never consumated, and on December 31, 1983, the transaction became subject to the Environmental Cleanup Responsibility Act (ECRA).

There were several court actions which established that ECRA was not superseded by the Federal Bankruptcy action. Borne and Bruncor were unwilling or unable to comply with ECRA, so the transaction involving those parties fell through.

The only remaining significant contract for oils is with the "Antair" Marine Company. Antair has reportedly been covering the operating losses of Borne over the past few months. Antair's contract expires on October 12, 1984. Borne's fire insurance also expires on October 12.

Mr. Veccione felt that continued litigation in the ECRA matter would be impossible because of the financial condition of Borne and the time required for litigation. He, therefore, suggested that the Department's previous suggestion that a Consent Order, with financial security, may be acceptable to the company. He suggested that the DEP establish an amount which DEP would accept as necessary financial security for the Order. Mr. Veccione will then actively seek purchasers for the property. He indicated that one party had expressed interest at the price of $150,000.

REFERENCE NO. 36

Telephone 201/591-0892

AGUILAR ASSOCIATES & CONSULTANTS. INC.

281 Highway 79 Suite 4

Morganville, New Jersey 07751

BORNE CHEMICAL COMPANY SITE

TANK/VESSEL INSPECTION REPORT

Prepared by

Aguilar Associates & Consultants, Inc.
281 Highway 79
Morganville, New Jersey 07751

Prepared for

State of New Jersey
Department of Environmental Protection
Hazardous Site Mitigation Administration
CN 028
Trenton, New Jersey 08625

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APPENDIX I - Computer Listing of Tank Contents

APPENDIX II - Computer Listing of Waste Categories

APPENDIX III - Field Data Sheets

TANK INVENTORY

BUILDING A - 1ST FLOOR	1 THRU 5
BUILDING A - 2ND FLOOR	6 THRU 29
BUILDING A - 3RD FLOOR	30 THRU 53
BUILDING B - 1ST FLOOR	-NO TANKS-
BUILDING B - 2ND FLOOR	54 THRU 60
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NOTE: UNDERLINED TANK NUMBEDS INDICATE SAMPLE EXTRACTION.

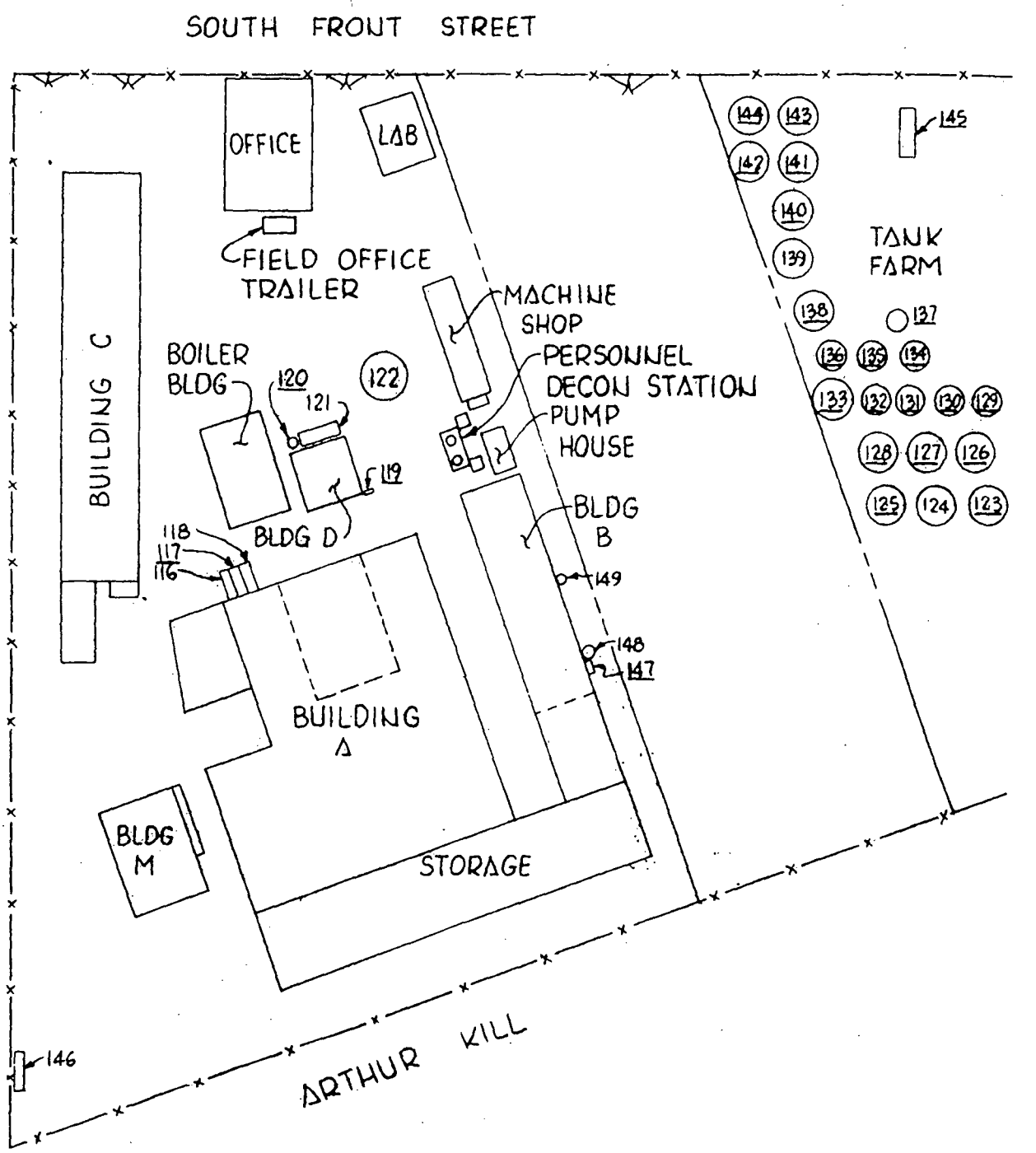
AGUILAR ASSOCIATES & CONSULTANTS, INC.
281 HIGHWAY 79
MODGANVILLE, NJ 07751

SCALE: 1" = 100'	APPROVED BY	DRAWN BY LJS
DATE: 5/1/86		REVISED

BORNE CHEMICAL CO. - SITE PLAN

CONTRACT NO. X-350	DRAWING NUMBER DEP-001-1

A


SOUTH FRONT STREET
OFFICE
LAB
FIELD OFFICE TRAILER
BUILDING C
BOILER BLDG
120
121
122
119
BLDG D
118
117
116
MACHINE SHOP
PERSONNEL DECON STATION
PUMP HOUSE
BLDG B
149
148
147
BUILDING A
BLDG M
STORAGE
146
ARTHUR KILL
144
143
142
141
140
139
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136
135
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133
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129
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145
TANK FARM

TANK/VESSELS INSPECTION REPORT

TANK LISTING - TANK FARM

Tank Conditions

Generally, tanks in the Tank Farm area are candidates for removal. Structures in several areas are beginning to lean due to the ground conditions. Exposure to the elements has deteriorated plating (3/8" cold rolled steel), ladders, and tops. Markings found on some tanks indicate that the most recent painting was performed in November, 1951. Although the rivet condition is noted as "good" (with the exception of tank #142), plating condition has deteriorated between riveted areas.

Some piping is asbestos wrapped, and securing straps and wires are deteriorating. Asbestos is evident on the ground within the tank farm and in the surrounding area. Unwrapped piping is found overhead, on the ground surface, underground, and on the tanks. Piping is rusted and in some cases leaking. Valves have been removed from some pipes and the pipe ends capped. Some valves were found buried under the thick sludge layer which covers most of the ground area within the tank farm. Some piping between tanks is disconnected at tanks and remains suspended above the ground on iron poles welded to tank sides.

Bottom manholes are covered with bolted plates. Some manholes are leaking, others have bolts missing. The seals on the plates are deteriorating.

Ladders for top access are in many cases unsound. Some have been disconnected at the top and resecured with ropes or chains.

Tanks #141, 142, 143, and 144 were involved in a spill and fire several years ago. The plating is obviously scorched and in places has started to bulge. Tanks #142 and 144 were cut open at the side plating and entered for repairs. The welding is now rusted and cracked. Tank #144 still has markings from the last structural inspection which Indicate thin spots in the plating throughout the entire structure.

Ground Conditions

During inspection and sampling activities conducted in February and March 1986, the following conditions were noted. During colder weather, a thick layer of ice was present which enabled access to all parts of the areas between tanks. After several days of above freezing weather, the ice deteriorated and access was hazardous due to the 2' to 3' deep water layer underneath. During sampling activities, wooden pallets had to be moved into the area to accommodate personnel access. When the ice had melted, the sludge layer underneath the water became evident and was found to be from 6" to 2' thick. Access to some areas then became extremely hazardous. Debris which is burled within the sludge layer includes broken glass, broken pipe sections, discarded valves, boards with nails protruding, wires, metal cans, and various other items.

During heavy rains experienced during the week of 10 thru 15 March, the water level increased and the last patches of ice melted. Wooden pallets placed for access sank to the sludge layer and, when walked across, caused oil to be released from the sludge layer. As temperatures increased, more oil was released from both the sludge and leaking manholes.

Recommendations for Removal of Contaminated Materials

Prior to any removal operations, it is recommended that dewatering be conducted in the entire Tank Farm area. After the water has been removed, the surface debris should be removed, and the area covered with pallets and/or plastic sheeting. If analysis proves there to be contamination with asbestos, oil or PCB, the water, sludge and debris may have to be containerized and disposed.

Existing piping and valves cannot necessarily be relied upon for removal of materials within the tanks. For low viscosity materials, a hose/vacuum pump system will be required at the top for removal down to the level of the bottom manholes. After the level is adequately lowered, the manholes could be opened for final removal and decontamination operations.

For heavier sludges and non-pumpable materials, a re-llqulfication process might be considered. Shovels or scoops could be employed, however, personnel access to the interior of the tanks is not recommended due to the depth of the materials.

After decontamination procedures are complete, tank dismantling should be considered due to the structural condition of the vessels. Great care should be excerclsed in the use of any cutting tools. All vapors and gases must be evacuated before any cutting and burning operations begin. Tank pieces must be carefully handled and set up In clean staging areas to prevent them from becoming contaminated again with sludges in the vicinity of the tanks.

Tank No. 124

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: EMPTY
Condition: Wall - Rusted, dented
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - Disconnected from main system
Capacity: 101,516 gals.
Access: Ladder attached

Tank No. 139

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: EMPTY
Condition: Wall - Rusted
Top Plating - conical, rusted
Rivet Condition - good
Piping Connections - Disconnected from main system. Valve at bottom disconnected.
Capacity: 101,516 gals.
Access: Ladder attached.

Tank No. 123

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 4" Oil - red, 1'-7" Sludge - thick, pink, cannot extract sample.
Volume of Contents: Oil - 1,128 gals., Sludge - 5,358 gals. (solidified)
Condition: Wall - Rusty, no leaks. Entire structure leaning.
Top Plating - Conical, in good shape but not thick enough to support weight.
Rivet Condition - Good
Piping Connections - Valve at fence side - closed, hose attached, valve at interior side - closed, piping attached.
Capacity: 101,516 gals.
Access: Ladder attached.

Tank No. 125

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 3'-6" Oil - black waste oil, 6'-5" Sludge - black, lumpy, mixed with some aqueous.
Volume of Contents: Oil - 11,844 gals., Sludge - 21,713 gals.
Condition: Wall - Rusty, some paint
Top Plating - Conical
Rivet Condition - Good
Piping Connections - Bottom disconnected, valve on interior closed, piping disconnected leaving valve-pipe to top intact, rusty.
Capacity: 101,516 gals.
Access: Ladder attached.

Tank No. 126

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 1'-5" Oil, I'-11" Aqueous, 11'-11" Sludge-1, 12'-4" Sludge-2.
Volume of Contents: Oil - 4,794 gals., Aqueous - 6,486 gals., Sludge-1 - 40,324 gals., Sludge-2 - 45,118 gals.
Condition: Wall - Rusted
Top Plating -
Rivet Condition - Good
Piping Connections - Inaccessable for inspection due to ground conditions.
Capacity: 101,516 gals.
Access: Ladder attached, bent at top.

Tank No. 127

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 25'-0"
Contents: 3" Oil - black, thin, 4'-2" Aqueous - orange with oil throughout, 13'-6" Sludge - thick, black, gelatinous.
Volume of Contents: Oil - 846 gals.. Aqueous - 14,100 gals., Sludge - 45,682 gals.
Condition: Wall - Rusted
Top Plating - Conical, good
Rivet Condition - Good
Piping Connections - Valve at bottom of pipe disconnected, valve at rear leaking, under water, pipe to top disconnected.
Capacity: 84,597 gals.
Access: Ladder attached, bent.

Tank No. 128

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 25'-0"
Contents: 2'-11" Oil - brown, medium viscosity,
15'-9" Sludge - mixed with water, black, lumpy.
Volume of Contents: Oil - 9,870 gals., Sludge - 53,296 gals,
Condition: Wall - Rusted, last painted November 1958.
Top Plating - Conical, good
Rivet Condition - good
Piping Connections - Rusted, connected at top, 1 bottom valve.
Capacity: 84,597 gals.
Access: Ladder attached, not in good shape.

Tank No. 129

Location: Tank Farm
Dimensions: Diameter - 18'-0", Depth - 20'-0"
Contents: 2'-1" Oil - black/brown, medium viscosity, 10'-11" Aqueous - rusty, brownish, 2'-0" Sludge - black, lumpy.
Volume of Contents: Oil - 3,965 gals., Aqueous - 20,779 gals.
Sludge - 3,807 gals.
Condition: Wall - Good
Top Plating - Conical
Rivet Condition - Good
Piping Connections - Disconnected from main system
Capacity: 38,068 gals.
Access: Ladder attached.

Tank No. 130

Location: Tank Farm
Dimensions: Diameter - 18'-0", Depth - 20'-0"
Contents: 1'-9" Oil - black, medium viscosity, 8'-11" Sludge - Solidified
Volume of Contents: Oil - 3,331 gals., Sludge - 16,972 gals. (not sampled)
Condition: Wall - Rusted, no paint
Top Plating - Conical, rusted
Rivet Condition - Good
Piping connections - Disconnected at bottom from main system
Capacity: 38,068 gals.
Access: Ladder attached, not secure.

Tank No. 131

Location: Tank Farm
Dimensions: Diameter - 18'-0", Depth - 20'-0"
Contents: Skim Oil, 3'-7" Aqueous - clear, clean, appears to be rainwater, 15'-5" Sludge - black, very thick, solid lumps.
Volume of Contents: Aqueous - 6,820 gals., Sludge - 29,344 gals.
Condltloh: Wall - Plating scorched at bottom
Top Plating - hole burned in plating, top rusted
Rivet condition - Good
Piping connections - Piping to top leaking. All valves disconnected.
Capacity: 38,068 gals.
Access: Ladder attached, loose on left side.

Tank No. 132

Location: Tank Farm
Dimensions: Diameter - 18'-0", Depth - 20'-0"
Contents: 1'-10" Oil - black, very thick, 10'-4" Aqueous, 3'-0" Sludge - red, lumpy.
Volume of Contents: Oil - 3,490 gals.. Aqueous - 19,669 gals., Sludge - 5,710 gals.
Condition: Wall - Rusted, no paint
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - Disconnected from main system
Capacity: 38,068 gals.
Access: Ladder attached.

Tank No.133

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 25'-0"
Contents: 3" Aqueous
Volume of Contents: Aqueous - 846 gals.
Condition: Wall - Rusted, no paint
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - Disconnected from main system
Capacity: 84,597 gals.
Access: Ladder attached.

Tank No. 134

Location: Tank Farm
Dimensions: Diameter - 18'-0", Depth - 20'-0"
Contents: 1'-6" Oil - black, medium viscosity, 9'-4" Sludge - black, very thick, lumpy.
Volume of Contents: Oil - 2,855 gals., Sludge - 17,765 gals.
Condition: Wall - Rusted, no paint
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - Piping disonnected from main system. Old oil sorbent boom at bottom oil soaked from old spills. Manhole at bottom leaking.
Capacity: 38,068 gals.
Access: Ladder attached.

Tank No. 135

Location: Tank Farm
Dimensions: Diameter - 18'-0", Depth - 20'-0"
Contents: 4" Oil - black, medium viscosity
Volume of Contents: Oil - 634 gals.
Condition: Wall - Rusted, no paint
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - Disconnected from main system.
Capacity: 38,068 gals.
Access: Ladder attached.

Tank No. 136

Location: Tank Farm
Dimensions: Diameter - 18'-0", Depth - 25'-0"
Contents: 2'-6" Oil - black, medium viscosity, 15'-0" Aqueous - rusty, dark brown, suspended oil, 1'-8" Sludge - black, lumpy.
Volume of Contents: Oil - 4,758 gals., Aqueous - 28,551 gals., Sludge - 3,172 gals.
Condition: Wall/Jacket - Rusted
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - Asbestos covered pipes on two sides. Piping disconnected from main system. Black sludge surrounds base. Bottom manhole missing some bolts, but not leaking.
Capacity: 38,068 gals.
Access: Ladder attached.

Tank No. 137

Location: Tank Farm
Dimensions: Diameter - 14'-0", Depth - 15'-0"
Contents: 3'-4" Aqueous, 10'-0" Sludge - black, thick, lumpy.
Volume of Contents: Aqueous - 3,838 gals.. Sludge - 11,514 gals.
Condition: Wall/Jacket - Rusted, no paint
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - No piping attached, valves under water. Old oil spill at base. Bottom manhole leaking.
Capacity: 17,272 gals.
Access: Ladder attached.

Tank No. 138

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 6" Aqueous - clear, possible rain water
Volume of Contents: Aqueous - 1692 gals.
Condition: Wall/Jacket - Rusted
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - Connected to valves at bottom of tank, disconnected from main system.
Capacity: 101,516 gals.
Access: Ladder attached.

Tank No. 140

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 4" Oil
Volume of Contents: Oil - 1,128 gals.
Condition: Wall/Jacket - Severely rusted, metal peeling from bottom of tank
Top Plating - Rusted
Rivet Condition - Good
Piping Connections - Piping connected to valve at bottom, disconnected from main system. Valve chained and locked. Bottom manhole partially burled under sludge.
Capacity: 101,516 gals.
Access: Ladder Attached.

Tank No. 141

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 1" Oil - black
Volume of Contents: Oil - 282 gals.
Condition: Wall/Jacket - Rusted, no paint. Scorched from fire. Structure leaning. Tank plating dented and bulging.
Top Plating - Conical, rusted
Rivet Condition - Good
Piping Connections - Disconnected from main system. Manhole at bottom open.
Capacity: 101,516 gals.
Access: Ladder attached.

Tank No. 142

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 3" Oil - brown/red
Volume of Contents: Oil - 846 gals.
Condition: Wall/Jacket - Rusted, no paint. Scorched from fire. Tank cut and repaired. Structure leaning. Plating dented and bulging.
Top Plating - Conical, rusted
Weld Condition - Repair welding rusted
Rivet condition - Unsound
Piping Connections - Disconnected from main system. Manhole at bottom open.
Capacity: 101,516 gals.
Access: Ladder attached.

Tank No. 143

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 4" Aqueous - milky colored, with floating patches of sludge.
Volume of Contents - Aqueous - 1,128 gals.
Condition: Wall/Jacket - Rusted, no paint. Scorched from fire.
Top Plating - Conical, rusted.
Rivet Condition - Good
Piping Connections - Disconnected from main system. Manhole at bottom open.
Capacity: 101,516 gals.
Access: Ladder attached.

Tank No. 144

Location: Tank Farm
Dimensions: Diameter - 24'-0", Depth - 30'-0"
Contents: 3" Oil - black, thin
Volume of Contents: Oil - 846 gals.
Condition: Wall/Jacket - Rusted, no paint. Scorched from fire. Tank cut and repaired. Plating thinning, dented, and bulging. Entire structure leaning.
Top Plating - Conical, rusted
Weld Condition - Repair welding rusted, cracked
Piping Connections - Disconnected from main system. Manhole at bottom open.
Capacity: 101,516 gals.
Access: Ladder attached.

Tank No. 145

Location: Tank Farm
Dimensions: Diameter - 10'-6", Length - 32'-0", horizontal tank
Contents: 6'-5" Sludge - very thick, black
Volume of Contents: Sludge - 13,270 gals.
Condition: Wall - Rusted
Top Plating - None
Weld Condition - Rusted
Piping Connections - Fill pipe at top connected to hose which was placed through fence. Hose moved to prevent use by passersby. Manhole at top open.
Capacity: 20,726 gals.
Access: Ladder unsafe.

FOR TANK LAYOUT SEE SITE PLAN

TANK/VESSELS INSPECTION REPORT

TANK LISTING - EXTERIOR TANKS

Tanks No. 116, 118

Location: Exterior Building A
Dimensions: Diameter - 7'-0", Length - 15'-6", horizontal tank.
Contents: EMPTY
Condition: Wall/Jacket - Good
Top Plating - None (horizontal tank)
Weld Condition - Good
Piping Connections - At bottom and top.
Capacity: 4,462 gals., each
Access: Manhole at top

Formerly used for storage and supply of fuel oils for heating plant and steam pipe system. All piping and valves are intact and usable for pumping. Tank and weld condition would allow reuse of these tanks for fuel oil storage. Decontamination could easily be accomplished with a steam jenny for interior and exterior, and existing valves at bottom used for evacuation of decon fluids.

Tank No. 120

Location: Exterior Building D, front
Dimensions: Diameter - 8'-0", Length - 21'-6", horizontal tank.
Contents: FUEL OIL STORAGE
Condition: Wall/Jacket - Good
Top Plating - None
Weld Condition - Good
Piping Connections - At top
Capacity: 8084 gals.
Access: Small manhole at top

This tank is presently in use for fuel oil storage. All piping and valves are operable and in use. This tank is the main fuel supply for all heating and steam systems within the plant.

Tank No. 122

Location: Exterior front, Ceramic Tank
Dimensions: Inside Diameter - 28'-0", Outside Diameter - 30'-0", Height - 30'-0"
Contents: EMPTY <<1" Sludge, no sample could be extracted.
Condition: Wall/Jacket - Ceramic jacket
Top Plating - None
Weld Condition - None
Piping Connections -
Capacity: 138,175 gals.
Access: Open manhole at bottom.

Tank No. 146

Location: Tank Truck
Contents: EMPTY
Condition: Wall/Jacket - Poor
Top Plating - Poor
Weld Condition - Poor
Piping Connections - None
Capacity: 5,000 gallon
Access: Manholes at top

This tank truck was obviously discarded due to its poor condition. Rust is evident throughout the entire structure. Holes in the tank top allow rainwater to enter which then drains out the holes in the bottom. Decontamination for this vehicle, if necessary, could be accomplished with a steam jenny, but would further deteriorate the condition. A vehicle wrecking service could be consulted for removal and disposal.

Tank No. 148

Location: Exterior Building B
Dimensions: Diameter - 8'-0", Height - 21'-6"
Contents: EMPTY
Condition: Wall/Jacket - Dented, some rust
Top Plating - Inaccessible
Weld Condition - Some rust evident
Piping Connections - None
Capacity: 8,322 gals.
Access: Not found

This tank was discarded in this area some time ago. A ladder Is attached for access to the top, but is not safe for use. The tank is not secured to any structure and rocks when pushed. If this tank is to be decontaminated and removed, it is recommended that it be placed horizontally and secured. Decontamination can be performed with a steam jenny and fluids evacuated with a hose/vacuum pump system.

Tank No. 149

Location: Exterior Building B - attached
Dimensions: -----
Contents: EMPTY
Condition: Wall/Jacket - Poor
Top Plating - Inaccessible
Weld Condition - Poor
Piping Connections - Rusted, broken off at bottom
Capacity: -----
Access: Tank is Inaccessible

This tank could not be reached for a complete inspection. It is attached to Building B on the second story and all piping has deteriorated. Tank walls are rusted through in some areas. It appears to be a reactor column, and has been empty for many years. Should disposal be necessary, the tank will have to be removed from the building and decontaminated on the ground.

Tank No. 117

Location: Exterior Building A
Dimensions: Diameter - 7'-0", Length - 15'-4", horizontal tank.
Contents: 1' Oil - clear, clean, possibly fuel oil.
Volume of Contents: Oil - 946 gals.
Condition: Wall/Jacket - Good
Top Plating - None (horizontal tank)
Weld Condition - Good
Piping Connections - At bottom and top
Capacity: 4,414 gals.
Access: Manhole at top

Used for storage of fuel oils for heating plant and steam pipe system. All piping and valves are intact and usable for evacuation. Tank and weld condition would allow reuse of this tank for fuel oil storage. Decontamination could easily be accomplished with a steam jenny for interior and exterior, and existing valves at bottom used for evacuation of decon fluids.

Tank No. 119

Location: Exterior Building D, rear
Dimensions: Diameter - 4'-0", Length - 6'0"
Contents: 2'-8" Aqueous - clear, clean, 4" Sludge - black/brown, loose
Volume of Contents: Aqueous - 250 gals., Sludge - 31 gals.
Condition: Wall/Jacket - Some surface rust
Top Plating - None
Weld Condition - Good
Piping Connections - None
Capacity: 564 gals.
Access: Movable top plate

This tank was used for storage of waste oils. The exterior of the tank is relatively clean, with a few rusty spots. The movable top plate covers a manhole cut into the tank plating, and was fabricated on site. Although the tank condition is generally good, the method of access precludes its reuse as a storage vessel. An operable valve is located at the bottom of the tank and could be used for evacuation of less vlscuous materials. Decontamination could be accomplished with a steam jenny and diesel, and fluids evacuated by the bottom valve.

Tank No. 121

Location: Exterior Building D, front
Dimensions: Diameter - 69", Depth - 72"
Contents: 4" Oil - black
Volume of Contents: Oil - 65 gals.
Condition: Wall/Jacket - Rusted
Top Plating - Rusted
Weld Condition - Good
Piping Connections - Disconnected
Capacity: 1,165 gals.
Access: Manhole at top

Although the exterior of this tank is rust covered, it appears to be structurally sound and would be acceptable for reuse after decontamination. It is thought that this tank was originally used for overflow of the large fuel tank (#120). Tank materials will have to be removed with a hose/vacuum pump system as there is no piping to facilitate evacuation. Prior to decontamination, this tank should be secured In place or dropped to a horizontal position.

Tank No. 147

Location: Exterior Building B
Dimensions: Diameter - 4'-0", Length - 10'-0", horizontal tank.
Contents: 12" Aqueous, 1" Sludge - thick, black.
Volume of Contents: Aqueous - 184 gals.. Sludge - 5 gals.
Condition: Wall/Jacket - Rusted
Top Plating - None (horizontal tank)
Weld Condition - Rusted
Piping Connections - Removed
Capacity: 942 gals.
Access: Manhole at top

This tank was removed from another area and placed in this spot for eventual disposal. The original use is unknown. The exterior of the tank is severly rusted and the manhole is open. Reuse is not recommended. This tank will have to be moved to facilitate access to the manhole for both evacuation and decontamination. A hose/vacuum system will be necessary for removal of materials and decontamination fluid.

FOR TANK LAYODT SEE SITE PLAN

FIELD WORK QUALITY AND ACCURACY SPOT-CHECKS

In order to maintain a high level of Quality Assurance and Qualtlty Control for determination of tank/vessel size, emptiness, location and numbering system, and measurement of material quantities and stratification, all information was extracted, recorded, and confirmed by a second or third person. When a doubt existed, the NJ DEP On-Scene Coordinator was summoned for a final decision.

The NJ DEP OSC spot-checked tank/vessel size, location, contents and stratification, and whenever possible, she witnessed the sampling operations, sampling equipment decontamination, numbering, and sealing of tanks/vessels.

On 4 March 1986, Ms. Chris Andreas and Mr. Charles Van Schiver of NJ DEP Bureau of Environmental Measures and Site Assessments audited the entire sampling equipment decontamination, stratification definition and sampling procedures.

The Site Supervisor checked tank/vessel inspection data and confirmed locations, sizes and contents. He also inspected sampling equipment three times per week for cleanliness at the decontamination station and by the sampling extraction station.

All sampling equipment was decontaminated as follows after every use.

1 - Thorough wash with diesel fuel
2 - Rinse with non-phosphate detergent and tap water
3 - Tap water rinse
4 - Distilled water rinse/deionlzed water rinse
5 - 10% nitric acid solution rinse
6 - Distilled water rinse/deionlzed water rinse
7 - Thorough wipe with pesticide grade acetone
8 - Distilled water rinse/deionlzed water rinse
9 - Allow to air dry for a minimum of fifteen (15) minutes before reuse.

All samples were extracted and containerized in one (1) liter amber bottles which were cleaned and prepared by Roy F. Weston Laboratories. All samples were kept in coolers and packed in R-19 vermiculite attic insulation. Each cooler was sealed and the completed, signed, and dated Chain of Custody form was placed in a plastic bag and attached to the top of the corresponding cooler. All coolers containing samples were kept in a locked car until delivery to the laboratory took place.

A complete investigation of access points was performed for the purpose of determining the proper method of sealing the tanks to prevent unauthorized filling or emptying of the bulk containers subsequent to the tank/vessel inspection. After the Investigation, Mr. C. Aguilar and Ms. L. Geiger Hurban met several times to determine the appropriate methods and/or the elimination of sealing due to impracticality.

It was determined and approved by the On-Scene Coordinator that the following tanks were to be sealed: 117, 119, 123, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, and 140. Several tanks were impossible to seal using plastic cables, so epoxy paint was applied at opposite sides of the manhole or

access cover to indicate tampering. Several of the sealed tanks were spot-checked by the NJ DEP On-Scene Coordinator for compliance.

APPENDIX I

COMPUTER LISTING OF TANK CONTENTS

BORNB CHEMICAL COMPANY INDIVIDUAL OIL SAMPLES

ANALYTICAL RESULTS

SAMPLE #	DATE COLLECTED	VOLUMB (gal.)	SPECIFIC GRAVITY	PCB (ppm)	BTU/Ib.	FLASH POINT (Deg. F)	VISCOSITY (SFS)	pH
7-0	03/03/86	500	.87	ND	20000	266	28	6.96
9-0	03/03/86	940	.9	ND	20000	>400	41	6
11-0	03/03/86	1650	.87	ND	20000	>400	26	6.25
13-0	03/03/86	1674	.99	ND	10000	220	N/A	5.2
17-0	03/03/86	1086	.89	ND	19000	>400	53	6.65
18-0	03/03/86	2212	.8816	ND	19000	>400	34	7.05
24-0	03/03/86	646	.8844	ND	20000	>400	115	7.2
28-0	03/03/86	1380	.8655	ND	20000	370	N/A	7.3
57-0	03/04/86	2183	.8844	8	19000	280	26	8.4
58-0	03/04/36	144	.9296	5	18000	325	32	7.5
59-0	03/04/86	360	.8909	ND	18000	245	22	8.65
54-0	03/03/86	91	1.0177	ND	16000	325	113	7.9
69-0	03/03/86	1319	.8852	ND	18000	265	72	8.95
70-0	03/03/86	336	.9587	ND	17000	300	17	9.1
72-0	03/03/86	48	.8783	ND	19000	>400	22	8.9
92-0	03/03/86	744	.9178	ND	18000	280	34	9.25
101-0	03/04/86	145	.9684	ND	15000	>400	163	9.75
117-0	03/06/86	946	.86	ND	19000	365	150	6.9
121-0	03/06/86	63	.911	ND	Not Combustible	186	44	5.3

BORNE CHEMICAL COMPANY - INDIVIDUAL OIL SAMPLES (cont'd)

ANALYTICAL RESULTS

SAMPLE #	DATE COLLECTED	VOLUME (gal.)	SPECIFIC GRAVITY	PCB (ppm)	BTU/lb.	FLASH POINT (deg. F)	VISCOSITY (SFS)	pH
123-0	03/12/85	1128	.927	8	17000	207	40	9.2
125-0	03/12/86	11844	.902	45	18000	200	149	8.25
126-0	03/13/86	4794	.891	21	14000	213	89	6.4
127-0	03/12/86	846	.903	105	11000	222	152	7.45
128-0	03/12/86	9870	.912	60	7300	112	25	9.15
129-0	03/17/85	3955	.958	ND	17000	160	207	8.1
130-0	03/17/86	3331	.905	32	18000	224	112	7.55
132-0	03/13/86	3490	.911	10	18000	153	243	9
134-0	03/17/86	2855	.882	ND	18000	160	85	5.65
135-0	03/17/86	634	.942	ND	14000	135	256	6.85
136-0	03/17/86	4758	H/A	ND	15000	90	97	6.95
140-0	03/17/85	1128	.904	NO	19000	197	79	6.95
141-0	03/13/86	282	.854	9	19000	225	54	5.75
142-0	03/13/86	846	.869	9	18000	227	43	5.25
144-0	03/13/86	846	.892	23	18000	135	64	7.25

BORNE CHEMICAL COMPANY - COMPOSITE OIL SAMPLES

AHALYTICAL RESULTS

COMPOSITE	% ORCANO HALOGEN	% ORGANO SULFUR	% ASH
7-0, 9-0, 11-0, 13-0	.01	1.4	32.2
17-0, 18-0, 24-0, 28-0	.01	.3	4.6
57-0, 58-0, 59-0, 101-0	<.01	1.2	2.2
54-0, 59-0, 70-0, 72-0, 92-0	.01	.7	3.2
117-0, 121-0	.03	.04	.01
123-0, 125-0, 125-0, 127-0, 128-0	.07	.7	2.4
129-0, 130-0, 134-0	.03	.6	3.8
132-0, 141-0, 142-0, 144-0	.13	.5	.4
135-0, 136-0, 140-0	2.13	.3	3.4

BORNE CHEMICAL COMPANY - COMPOSITE OIL SAMPLES

PRIORITY POLLUTANT METALS ANALYTICAL RESULTS

COMPOSITE	AG (ppm)	AS (ppm)	BE (ppm)	CD (ppm)	CR (ppm)
7-0, 9-0, 11-0, 13-0	<1.08	.038	<0.01	<0.56	14.3
17-0, 18-0, 24-0, 28-0	<1.0S	.042	<0.01	<0.56	<1.56
57-0, 58-0, 59-0, 101-0	<1.08	<0.025	<0.50	<0.56	<1.56
64-0, 69-0, 70-0, 72-0, 92-0	<1.08	.131	<0.01	<0.56	<1.55
117-0, 121-0	<1.08	.052	<0.50	<0.56	<1.55
123-0, 125-0, 126-0, 127-0, 128-0	<1.08	.104	<0.50	<0.55	13.3
129-0, 130-0, 134-0	<1.08	.366	<0.50	<0.56	2.95
132-0, 141-0, 142-0, 144-0	<1.08	.034	<0.50	7.53	1.81
135-0, 135-0, 140-0	<1.08	<0.025	<0.50	.87	2.34

BORNE CHEMICAL COMPAMY - COMPOSITE OIL SAMPLES (cont'd)

PRIORITY POLLUTANT METALS ANALYSIS

COMPOSITE	CU (ppm)	HC (ppm)	NI (ppm)	PB (ppm)
7-0, 9-0, 11-0, 13-0	24.5	.054	6.23	29.4
17-0, 18-0, 24-0, 28-0	<1.54	.091	<2.8	<3.8
57-0, 58-0, 59-0, 101-0	10.3	<0.033	3.34	11.2
64-0, 69-0, 70-0, 72-0, 92-0	<1.54	.08	<2.8	<3.8
117-0, 121-0	<1.54	.059	<2.8	<3.8
123-0, 125-0, 126-0, 127-0, 128-0	34.6	.658	4.67	12.3
129-0, 130-0, 134-0	4.88	.128	<2.8	8.62
132-0, 141-0, 142-0, 144-0	11.8	.235	3.2	23.4
135-0, 136-0, 140-0	6.84	1.07	2.86	16.1

BORNE CHEMICAL COMPANY - COMPOSITE OIL SAMPLES (cont'd)

PRIORITY POLLUTANT METALS ANALYSIS

COMPOSITE	SB (ppm)	SE (ppm)	TL (ppm)	ZN (ppm)
7-0, 9-0, 11-0, 13-0	<11.0	<0.025	<13.4	627
17-0, 18-0, 24-0, 28-0	<11.0	<0.025	<13.4	2.85
57-0, 58-0, 59-0, 101-0	<11.0	<0.025	<13.4	230
64-0, 69-0, 70-0, 72-0, 92-0	<11.0	<0.025	<13.4	521
117-0, 121-0	<11.0	<0.025	<13.4	4.27
123-0, 125-0, 126-0, 127-0, 128-0	<11.0	<0.025	<13.4	111
129-0, 130-0, 134-0	<11.0	<0.025	<13.4	87.2
132-0, 141-0, 142-0, 144-0	<11.0	<0.025	<13.4	861
135-0, 136-0, 140-0	<11.0	<0.025	<13.4	52.3

BORNE CHEMICAL COMPANY - INDIVIDUAL SLUDGE SAMPLES

ANALYTICAL RESULTS

SAMPLE #	DATE COLLECTED	VOLUME (gal.)	SPECIFIC GRAVITY	PCB (ppm)	BTU/lb.	pH
3-S	03/05/86	634	.8789	ND	20000	7
59-S	03/05/85	576	1.0274	1.4	Not Combustible	10.2
59-S	03/05/85	254	1.0199	ND	14000	8.35
70-S	03/05/85	192	1.1327	ND	12000	9.8
71-S	03/05/86	24	1.0016	.1	12000	8.8
75-S	03/05/85	264	N/A	29	10000	8.6
85-S	03/05/86	744	N/A	ND	16000	8.95
86-S	03/05/86	21	1.2172	ND	10000	7.65
100-S	03/05/86	940	N/A	ND	2800	9.85
101-S	03/05/86	*	1.0291	2.5	13000	8.85
103-S	03/05/86	1184	1.0029	.015	5500	9.3
104-S	03/05/86	21	1.0708	.1	Not Combustible	9.7
105-S	03/05/86	1086	N/A	.14	3000	9.55
106-S	03/06/86	2314	.899	5.2	18000	6.55
107-S	03/06/86	3964	N/A	.76	Not Combustible	3.55
108-S	03/06/86	316	.918	110	15000	7.85
109-S	03/06/86	316	.88	1.9	20000	6.85
119-S	03/06/86	31	.925	31	19000	8

* Contents of Tank #101 is a mixture of oil/aqueous/sludge. Total volume is listed as oil.

BORNE CHEMICAL COMPANY - INDIVIDUAL SLUDGE SAMPLES (cont'd)

ANALYTICAL RESULTS

SAMPLE #	DATE COLLECTED	VOLUME (gal.)	SPECIFIC GRAVITY	PCB (ppm)	BTU/lb.	pH
125-S	03/12/85	21713	.933	.066	9300	7
126-S	03/13/85	40324	.951	8	11000	5.65
126-S2	03/13/85	45118	.997	50	8900	5.75
127-S	03/13/86	45682	.939	.012	9700	7.15
128-S	03/13/86	53296	.987	125	9100	9.45
129-S	03/17/86	3807	1.013	2.3	9600	8.35
131-S	03/17/86	29344	1.126	ND	10000	8.9
132-S	03/13/85	5710	.993	200	9500	7.85
134-S	03/17/86	17755	.905	ND	19000	7.25
135-S	03/17/86	3172	1.038	ND	7200	6.55
137-S	03/17/86	11514	1.096	ND	11000	9.7
145-S	03/13/86	13270	.919	ND	17000	5.7
147-S	03/17/86	5	.984	ND	17000	8

BORNE CHEMICAL COMPANY - COMPOSITE SLUDGE SAMPLES

ANALYTICAL RESULTS

COMPOSITE	% ORGANO HALOGEN	% ORGANO SULFUR	CYANIDES (ppm)	TOTAL PETROLEUM HYDROCARBONS	% ASH
59-S, 59-S, 70-S, 71-S	.02	.8	<.5	74.2%	15.3
75-S, 85-S, 86-S, 100-S	.04	5.3	<.5	64.3%	60.4
101-S, 103-S, 104-S, 105-S	<.01	1.4	<.5	52.1%	27.9
105-S, 107-S, 108-S, 109-S, 119-S	.38	1	1.01	119%	6.7
125-S, 126-S, 125-S2, 127-S, 128-S	.44	.4	3.97	197%	4.3
129-S, 131-S, 134-S	.07	.4	<.5	122%	2.4
132-S, 145-S	.27	1.3	5.72	125%	5.9
136-S, 137-S, 147-S	.09	1	<.5	105%	7.7
3-S	.39	0	<.5	79.7%	.06

BORNE CHEMICAL COMPANY - COMPOSITE SLUDGE SAMPLES

PRIORITY POLLUTANT METALS ANALYTICAL RESULTS

COMPOSITE	AC (ppm)	AS (ppm)	BE (ppm)	CD (ppm)	CR (ppm)
59-S, 59-S, 70-S, 71-S	<1.23	1.83	<1.26	.578	7.28
75-S, 85-S, 85-S, 100-S	<1.05	3.74	<0.50	1.19	59.7
101-S, 103-S, 104-S, 105-S	<1.07	2.21	<1.07	.491	8.55
106-S, 107-S, 108-S, 109-S, 119-S	<1.14	<1.14	<1.14	.33	18.4
125-S, 126-S, 125-S2, 127-S, 128-S	<1.08	3.35	<0.50	<0.56	105
129-S, 131-S, 134-S	<1.08	.332	<0.50	<0.56	<1.55
132-S, 145-S	<1.08	.041	<0.50	1.19	9.82
135-S, 137-S, 147-S	<1.08	.582	<0.50	<0.55	3.51
3-S	<1.08	.31	<0.50	<0.56	<1.55

BORNE CHEMICAL COMPANY - COMPOSITE SLUDGE SAMPLES (cont'd)

PRIORITY POLLUTANT METALS ANALYTICAL RESULTS

COMPOSITE	CU (ppm)	HG (ppm)	NI (ppm)	PB (ppm)
59-S, 69-S, 70-S, 71-S	46.1	<.357	14.1	3.38
75-S, 85-S, 86-S, 100-S	710	1.61	72.8	23.5
101-S, 103-S, 104-S, 105-S	50.5	<.385	13.5	81.7
106-S, 107-S, 108-S, 109-S, 119-S	50.5	<.309	<4.55	125
125-S, 125-S, 125-S2, 127-S, 128-S	123	.661	13.3	14.6
129-S, 131-S, 134-S	9.83	.231	3.76	7.86
132-S, 145-S	38.5	2.86	7.11	37.5
136-S, 137-S, 147-S	25.9	.327	9.39	19.7
3-S	3.99	<.258	3.95	<3.80

BORNE CHEMICAL COMPANY - COMPOSITE SLUDGE SAMPLES (cont'd)

PRIORITY POLLUTANT METALS ANALYTICAL RESULTS

COMPOSITE	SB (ppm)	SE (ppm)	TL (ppm)	ZN (ppm)
59-S, 69-S, 70-S, 71-S	5.74	<.507	<1.26	2610
75-S, 85-S, 85-S, 100-S	<2.68	<.548	<1.05	7330
101-S, 103-S, 104-S, 105-S	4.21	.67	<1.07	35.8
105-S, 107-S, 108-S, 109-S, 119-S	<2.82	<.528	<1.14	109
125-S, 126-S, 126-S2, 127-S, 128-S	<11.0	.042	<13.4	424
129-S, 131-S, 134-S	<11.0	<0.025	<13.4	70.3
132-S, 145-S	<11.0	<0.025	<13.4	40500
136-S, 137-S, 147-S	<11.0	<0.025	<13.4	120
3-S	<11.0	<0.025	<13.4	10.4

BORNE CHEMICAL COMPANY - INDIVIDUAL AQUEOUS SAMPLES - ANALYTICAL RESULTS

SAMPLE #	DATE COLLECTED	VOLUME (gals.)	SPECIFIC GRAVITY	pH
23-A	03/03/86	2506	1.0024	7.75
32-A	03/05/86	744	1.0375	7.4
40-A	03/05/86	500	1.0022	7
53-A	03/05/86	1233	1.0035	6.75
59-A	03/04/86	384	1.0393	10.8
60-A	03/04/86	1679	1.0023	4.55
65-A	03/04/86	552	.9963	11.15
71-A	03/04/86	96	1.0028	9.25
76-A	03/04/85	1723	1.0026	6.2
87-A	03/04/85	891	.9969	9.45
96-A	03/04/86	239	1.0078	8.05
101-A	03/05/86	145	1.0068	8.2
104-A	03/04/86	561	1.0008	8.75
112-A	03/05/86	439	1.034	5.75
119-A	03/06/85	250	1.033	8.35
126-A	03/13/86	6486	1.058	6.3
127-A	03/12/86	14100	.934	7.85
129-A	03/17/86	20779	1.025	8.15
131-A	03/17/86	6820	.994	7.05
132-A	03/13/86	19669	.996	8.95
133-A	03/13/86	846	.997	11.15
135-A	03/17/86	28551	1.009	6.7
137-A	03/17/86	3838	1.052	8.65
138-A	03/17/86	1692	1.048	7.65
143-A	03/17/86	1128	1.044	7.25
147-A	03/17/86	184	1.041	7.4
SEW-A	03/19/86			5.35

BORNE CHEMICAL COMPANY - COMPOSITE AQUEOUS SAMPLES

ANALYTICAL RESULTS

COMPOSITE	PCB (ppb)	SULFIDE (ppm)	CYANIDE (ppm)	TOC (ppm)	TOX (ppm)
69-A, 60-A, 66-A, 71-A	61	60	<.010	41200	10.6
76-A, 87-A, 96-A, 101-A, 104-A	19.2	<0.4	.029	2240	3.3
23-A, 32-A, 40-A, 53-A	ND	33.6	<.010	214	23.2
112-A	ND	9.6	<.010	3980	91.9
119-A	ND	19.2	<.010	3020	11.3
126-A, 127-A, 132-A, 133-A	ND	164	<.010	9330	49.9
129-A, 131-A, 136-A, 137-A	660	188	<.010	14900	63.6
138-A, 143-A, 147-A	16	<0.4	<.010	96.3	46.1
SEW-A (Individual Sample)	4	<0.4	<.010	502	3.2

BORNE CHEMICAL COMPANY - COMPOSITE AQUEOUS SAMPLES

PRIORITY POLLUTANT METALS ANALYTICAL RESULTS

COMPOSITE	AG (ppm)	AS (ppm)	BE (ppm)	CD (ppm)	CR (ppm)
59-A, 60-A, 65-A, 71-A	N/A	N/A	<.50	<.50	<.50
75-A, 87-A, 95-A, 101-A, 104-A	<0.50	<.010	<.50	<.50	<.50
23-A, 32-A, 40-A, 53-A	<0.50	<.010	<.50	<.50	<.50
112-A	<0.50	.05	<.50	<.50	<.50
119-A	<0.50	<.010	<.50	<.50	<.50
126-A, 127-A, 132-A, 133-A	<.010	<.010	<.010	<.0025	.079
129-A, 131-A, 135-A, 137-A	<.010	<.019	<.010	.033	.049
138-A, 143-A, 147-A	<.010	<.010	<.010	<.0025	<.025
SEW-A (Individual Sample)	<.010	<.010	<.010	.005	.029

BORNE CHEMICAL COMPANY - COMPOSITE AQUEOUS SAMPLES

PRIORITY POLLUTANT METALS ANALYSIS - (cont'd)

COMPOSITE	CU (ppm)	HC (ppb)	NI (ppm)	PB (ppm)
59-A, (60-A), 65-A, 71-A	<.50	<.50	2.08	<.50
75-A, 87-A, 96-A, 101-A, 104-A	<.50	<.50	<.50	.53
23-A, 32-A, 40-A, 53-A	<.50	<.50	<.50	<.50
112-A	1.21	12.3	.51	<.50
119-A	<.50	<.50	<.50	<.50
126-A, 127-A, 132-A, 133-A	.045	<.50	.299	.023
129-A, 131-A, 135-A, 137-A	.213	3.15	.175	.523
138-A, 143-A, 147-A	<.025	<.50	<.040	.019
SEW-A (Individual Sanple)	.693	<.50	<.040	.008

BORNE CHEMICAL COMPANY - COMPOSITE AQUEOUS SAMPLES (cont'd)

PRIORITY POLLUTANT METALS ANALYSIS

COMPOSITE	SB (ppm)	SE (ppm)	TL (ppm)	ZN (ppm)
59-A, (60-A), 65-A, 71-A	1.4	N/A	<.05	N/A
75-A, 87-A, 96-A, 101-A, 104-A	<.50	<.005	<.05	<.05
23-A, 32-A, 40-A, 53-A	<.50	<.005	<.05	13.5
112-A	<.50	.012	<.05	4.87
119-A	<.50	<.005	<.05	.55
126-A, 127-A, 132-A, 133-A	<.025	.007	<.010	5.19
129-A, 131-A, 136-A, 137-A	<.025	.005	<.010	5.99
138-A, 143-A, 147-A	<.025	<.005	<.010	.061
SEW-A (Individual Sample)	<.025	<.005	<.010	.107

APPENDIX II

COMPUTER LISTING OF WASTE CATEGORIES

BORNE CHEMICAL COMPANY SIIE

Elizabeth, NJ

WASTE CATEGORY 1 - NON-AOUEOUS PUMPABLE <50 ppm PCB

DISPOSAL METHODS 1, 2*, 1 and 6 *If waste aolldiiled

Tank No.	Waste Type	Volume (Gallons)	PCB (ppn)	Remarks
3	Sludge	634	ND	Low metal content
7	Oil	500	ND	Low natal content
9	Oil	940	ND	Low metal content
11	Oil	1550	ND	Low metal concent
13	Oil	1674	ND	Low metal content
17	Oil	1086	ND	Low metal content
18	Oil	2212	ND	Low metal content
24	Oil	546	ND	Low mecal content
28	Oil	1380	ND	Low metal content
57	Oil	2183	8.0	High metal content
58	Oil	144	5.0	High metal content
59	Oil	360	ND	High metal content
59	Sludge	575	1.4	High metal content
64	Oil	91	ND	High metal content
69	Oil	1319	ND	High metal content
69	Sludge	254	ND	High metal content
70	Oil	336	ND	High metal content
71	Sludge	24	0.1	High metal content
72	Oil	48	ND	High necal content
85	Sludge	744	ND	High metal contaat
92	Oil	744	ND	High necal content
101*	Oil	145	ND	*Hlx of sludge, oil & aqueous. PCB content varies with strata.
101*	Sludge	*	2.6	*Mlx of sludge, oil & aqueous. PCB content varies with strata.
103	Sludge	1185	0.01S	High metal content
104	Sludge	21	0.1	Hlah metal content

103	Sludge	1185	0.015	High metal content
104	Sludge	21	0.1	High metal content
109	Sludge	315	1.9	High metal content
117	Oil	946	ND	Low metal content
119	Sludge	31	31	High metal content
121	Oil	65	ND	High metal content
123	Oil	1128	8.0	High metal content
125	Oil	11844	45.0	High metal content
125	Sludge	21713	0.065	High metal content
126	Oil	4794	21.0	High metal content
126	Sludge	40324	8.0	High metal content
126	Sludge2	45118	50	High metal content
127	Sludge	45682	0.012	High metal content
129	Oil	3955	ND	Non-Detectable PCB
129	Sludge	3807	2.5	High metal content
130	Oil	3331	32.0	High metal content
131	Sludge	29344	ND	High metal content
132	Oil	3490	10.0	High metal content
134	Oil	2855	ND	Non-Detectable PCB
134	Sludge	17765	ND	High metal content
135	Oil	534	ND	Non-Detectable PCB
135	Oil	4758	ND	Non-Detectable PCB
135	Sludge	3172	ND	High metal content
137	Sludge	11514	ND	High metal content
140	Oil	1128	NO	Non-Detectable PCB
141	Oil	282	9.0	High metal content
142	Oil	845	9.0	High metal content
144	Oil	846	23.0	High metal content

TOTAL VOLUME WASTE CATEGORY 1 278604 gallons

*Tank 101 contains a mixture of oil, sludge, and aqueous material. Separation of phases may not be possible during disposal activities. Total volume is indicated above as a non-aqueous waste. PCB concentration varied with phases as follows:

Oil Phase: Non-Detectable

[illegible] waste as a non aqueous waste. The concentration varied with phases as follows:

Oil Phase: Non-Detectable

Sludge Phase: 2.6 ppm

~~Aqueous Phase: 0.0192 ppm as part of composite with 76, 87, 96, & 104~~

Material will be categorized as "Non-aqueous, pumpable waste, less than 50 ppm PCB" and quantity shown in this category only.

BORNE CHEMICAL COMPANY SITE

Elizabeth, NJ

WASTE CATEGORY 2 - NON-AQUEOUS PUMPABLE >50 ppm PCB

DISPOSAL METHODS 2* and 3 *If waste solidified

Tank No.	Waste Type	Volume (Gallons)	PCB (ppm)	Remarks
108	Sludge	316	110	High metal content
127	Oil	846	105	High metal content
128	Oil	9870	60	High metal concent
128	Sludge	53296	125	High metal contenc
132	Sludge	5710	200	High mecal content

TOTAL VOLUME WASTE CATEGORY 2 70038 gallons

BORNE CHEMICAL COMPANY SITE

Elizabeth, NJ

WASTE CATEGORY 3 - AQUEOUS PUMPABLE WASTE

DISPOSAL METHODS 2*, 3, 4, 5, and 7 * If waste solidified.

Tank No.	Waste Type	Volume (Gallons)	PCB (ppm)	Remarks
23	Aqueous	2506	ND	
32	Aqueous	744	ND	
40	Aqueous	500	NO	
53	Aqueous	1233	ND	
59	Aqueous	384	0.016 **	
60	Aqueous	1579	0.016 **	
65	Aqueous	552	0.016 **	
71	Aqueous	95	0.016 **	
76	Aqueous	1723	0.0192 ***	
87	Aqueous	890	0.0192 ***	
96	Aqueous	240	0.0192 ***	
101*	Aqueous	*	0.0192 ***	*Mix of sludge, oil & aqueous. PCB content varies with strata.
104	Aqueous	551	0.0192 ***	
112	Aqueous	439	ND	
119	Aqueous	250	ND	
126	Aqueous	5486	ND	
127	Aqueous	14100	ND	
129	Aqueous	20779	0.660 ****	
131	Aqueous	6820	0.660 ****	
132	Aqueous	19659	ND	
133	Aqueous	846	ND	
136	Aqueous	28551	0.550 ****	

137	Aqueous	3838	0.660 ****
138	Aqueous	1692	0.016 *****
143	Aqueous	1128	0.016 *****
147	Aqueous	184	0.016 *****

TOTAL VOLUME WASTE CATEGORY 3 116890 gallons

*Tank 101 contains a mixture of oil, sludge, and aqueous material. Separation of phases may not be possible during disposal activities. Total volume is indicated above as a non-aqueous waste. PCB concentration varied with phases as follows:

Oil Phase: Non-Detectable

Sludge Phase: 2.6 ppm

Aqueous Phase: 0.0192 ppm as part of composite with 76, 87, 96, & 104

Material will be categorized as "Non-aqueous, pumpable wasce, less than 50 ppm PCB" and quantity shown in this category only.

** PCB concentration as part of composite of 59, 60, 65, & 71

*** PCB concentration as part of composite of 76, 87, 96, 101, & 104

**** PCB concentration as part of composite of 127, 129, 132, & 133

***** PCB concentration as part of composite of 138, 143, & 147

BORNE CHEMICAL COMPANY SITE

Elizabeth, NJ

WASTE CATTEGORY 4 - SOLIDIFIED CONTAMINATED SLUDGE <50 ppm PCB

DISPOSAL METHOD 2 and 3

Tank No.	Waste Type	Volume (Gallons)	PCB (ppm)	Remarks
70	Sludge	192	ND	High metal content
75	Sludge	264	29	High metal content
86	Sludge	21	ND	High metal content
100	Sludge	940	ND	High metal content
105	Sludge	1086	0.14	High metal content
106	Sludge	2314	5.2	High metal content
107	Sludge	3964	0.75	High metal content
145	Sludge	13270	ND	High metal content
147	Sludge	5	ND	High metal content

TOTAL VOLUME WASTE CATEGORY 4 22056 gallons

REFERENCE NO. 37

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Bome Chemical file

DATE: 03/07/97

FROM: K. Campbell

SUBJECT: Adjacent Property Use (KC)

REFERENCE

Borne leased the adjacent lot from the Baltimore Railroad. The property was reportedly utilized for the storage of drums, including drums of magnesium oxide/oil mixture that were blended for Rolfite (Attachment A). On November 1, 1980, Bome completed the removal of its drums from this property (Attachment B). A subsequent removal conducted by Rolfite accomplished the removal of the remainder of the drums stored at this location.

Ref. 37

ADM-012

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Vince Krisak

FROM Fred Sickels

DATE February 20, 1984

SUBJECT Meeting Concerning Borne Chemical Company and Prospective Buyers - 20-04-07

This memo provides a summary of three meetings I attended on February 15, 1984, at the Labor and Industry Building, Trenton, New Jersey.

MEETING #1

This meeting involved representatives of Borne Chemical Company, Prospective Buyers of the facility, N.J.D.E.P., and the Office of Regulatory Services. The meeting began at 1030 hours. Those in attendance were:

Herbert Brunweiser	-	Partner in Bruncor - Proposective Buyer
A.J. Corona	-	Partner in Bruncor
W.P. Munday	-	Attorney for Bruncor
Michael Rodberg	-	Attorney for Bruncor
S.K. Patrick	-	Borne Chemical Company
Paul Defilippo	-	Attorney for Borne Chemical Company
Tony McMahon	-	DEP - ECRA
Joseph Schmidt	-	DEP - ORS
Chris Altomari	-	DEP - HSMA
Scott Santor	-	DEP - HSMA
Bob Patel	-	DEP - BHWE
Phil Yeany	-	DEP - ORS
Fred Sickels	-	DEP - BFO - Central

(See attached sign in sheet.)

This meeting opened with Mr. Corona stating his interest in buying the processing area of the Borne Chemical Company (Note: Borne is presently in bankrupcy court). He stated that his financing has been arranged and that he has invested much of his own money into this project. He stated that if he doesn't move soon he may lose business and his financing. At this time, Mr. McMahon stated that ECRA requires a site be cleaned up prior to sale or if not cleaned up, a bond put up to assure a cleanup. Mr. Patrick, his attorney and all Borne representatives stated that no money is available for this. Mr. Patrick stated that if the State blocks this sale, this site will be abandoned and the State will have to clean it up. Mr. McMahon stated that he has to enforce ECRA and insist that the regulations be followed. Attorney's representing both interests stated that the matter will be heard in court to determine if the DEP through ECRA has authority to stop a sale even though the bankruptcy court has previously ordered it to be closed. The Bureau of Field Operations - Central - has no involvement in this portion of the Borne Chemical Company transaction except to monitor the disposal of any materials removed during a cleanup.

Ref. 27

Att. A, p. 1

MEETING #2 (1230 Hours)

This meeting involved the concerns of another prospective buyer of the Borne Chemical Company. The meeting involved the ECRA statute and its impact on this situation. The prospective buyers wanted to know what requirements they would need to fulfill prior to the DEP allowing them to operate. Their concerns were that it may not be economically feasible to purchase the plant if ECRA required an expensive sampling and cleanup program. The meeting adjourned after Mr. McMahon outlined the ECRA requirements. The attendees were as follows:

Chris Altomari	-	DEP - HSMA
Scott Santora	-	DEP - HSMA
Bob Patel	-	DEP - BHWE
S.K. Patrick	-	Borne Chemical Company
Paul Defilippo	-	Attorney for Borne Chemical Co.
Phil Yeany	-	DEP - ORS
Tony McMahon	-	DEP - ECRA
Joseph Schmidt	-	DEP - ORS
R. Boyle	-	Prospective Buyer
Joe Dziak	-	Attorney for Prospective Buyer
Fred Sickels	-	DEP - BFO - Central

MEETING #3 (1430 Hours)

This meeting involved representatives of Borne Chemical Company, Rolfile Company and N.J.D.E.P.

The subject was the removal of approximately 600 drums of material with Rolfile wants to buy from Borne Chemical Company. Those in attendance were:

Phil Yeany	-	DEP - ORS
Fred Sickels	-	DEP - BFO - Central
Scott Santora	-	DEP - HSMA
Robert Hockfield	-	Rolfile - Secretary
Peter Ghirla	-	Rolfile - President
Ernest Roth	-	Valley Forge Engineering, Inc.
S.K. Patrick	-	Borne Chemical Company
Rebecca Fields	-	D.A.G.
Chris Altomari	-	DEP - HSMA

Mr. Patrick explained that Borne Chemical Company has been trying for years to get Rolfile to remove their material from the Borne site. According to Mr. Patrick Borne used to blend MgO with high grade oils for the Rolfile Company. Rolfile would send the MgO to Borne for

blending because they had no blending capability in their Connecticut plant. Mr. Ghirla agreed with this account. Mr. Ghirla also stated that during blending, portions of the MgO would precipitate out and collect in the mixing vat. The precipitate would be placed in drums and then reblended as needed. When the Borne Chemical Company stopped blending for Rolfile, the precipitate remained in the drums. Those drums were stored on the Borne property until they were placed on an adjacent lot (owned by the Baltimore R.R.) leased by Borne. This is where the drums are now located. Mr. Ghirla stated that MgO is blended with the oil to lower sulpher emissions when it is burned. Rolfile wants to buy the material back from Borne Chemical Company and return it to their Stanton, Connecticut plant where they now have blending capability. I stated that I would like a composite sample to be taken from a representative number of drums to determine if the material is what Mr. Ghirla believes it to be. Mr. Ghirla agreed to do this. I also had concern about moving the material without a manifest. Even though it appears that the material will be recycled as it would have been under normal conditions, the Bureau of Classification may consider it to be a hazardous waste requiring a manifest and TSD status for Rolfile. Mr. Ghirla will send me a letter outlining what the material is, what it is used for and how it was produced. I will forward this information to "classification" for their input. If we do not allow Rolfile to remove this material for reuse, it will stay on railroad property and the railroad may be responsible for its disposal. I will await Mr. Ghirla's memos and proceed from that point.

FOC4:dg
Enclosure

Ref. 37

Att. A, p. 3

BORNE CHEMICAL COMPANY, INC.

Elizabeth, N. J. 07207
201-[illegible] N.Y. [illegible]
TELEX — [illegible]

November 7, 1980

N.J. Dept. of Environmental Protection
Solid Waste Administration
32 East Hanover Street
Trenton, New Jersey 08625

ATTN: Mr. Kevin Gashlin, Environmental Specialist

Dear Mr. Gashlin: RE: Our meeting of Oct. 27, 1980

On November 1st, 1980, Borne Chemical completed removal of all Borne Chemical drums of concern in the plant yard between the railroad trestle and our buildings in the manner agreed upon. When you are in the area, please contact me to confirm this.

Also, during our October 27th, 1980 meeting you indicated that you would recommend to the N.J. Solid Waste Administration that an Administrative Order be issued to the Rolfite Company for timely and total removal of their property at the Borne Chemical Plant, Elizabeth, New Jersey. The Rolfite Company property of concern is essentially that in the inventory listing as of June 3rd, 1980, a copy of which was provided to you at our meeting.

Borne Chemical would appreciate quick issuance of the Administrative Order to the Rolfite Company in order to complete our plant program. Please advise me of the anticipated issuance date of the Administrative Order. Also, Borne Chemical requests a copy of the Order in order to accommodate it's implementation.

Sincerely yours,

A. J. Corona

A. J. Corona
General Manager

AJC/BHO

CC: Lewis M. Markowitz, Esq.
Donald H Steekroth, Esq.
Stuart K Patrick
Herbert Brunnwasser

BORNE CHEMICAL COMPANY, INC.

PETROCHEMICALS • LUBRICATING OILS • GREASES • TEXTILE OILS • TEXTILE TINTS • LEATHER COMPOUNDS • OIL ADDITIVES

Ref. 37

Att. B, p. 1

REFERENCE NO. 38

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM	PROJECT NOTES
TO: Borne Chemical file	DATE: 04/25/97 (Revised 05/06/97) (Page 1)
FROM: K. Campbell	
SUBJECT: RCRA/NJ Hazardous Waste Codes	

REFERENCE

The following presents a selection of wastes that have been removed from site (Ref No. 14, pp. 2-5, 2-6, 2-37 through 2-40 of this document) and their corresponding RCRA hazardous waste codes; Attachment A provides the appropriate pages from CFR 40, Part 261 for ease of reference.

RCRA Waste Code	Characteristic or Contaminant [Page No(s). Of Attachment A]
D001	ignitability (2, 3)
D002	corrosivity (3)
D003	reactivity (3)
D005	barium (3)
D008	lead (3)
D009	mercury (3)
D011	silver (3)
D017	2,4,5-TP Silvex (3)
F001	spent halogenated solvents (4)
F003, F004, F005	spent non-halogenated solvents (4)
P028	benzyl chloride (5)
U037	chlorobenzene (6)
U031	1-butanol (6)
U211	carbon tetrachloride (6)
U052	cresol (6)
U226	methyl chloroform (7)
U188	phenol (7)

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM **PROJECT NOTES**

TO: Borne Chemical file

DATE: 04/25/97 (Revised 05/06/97) (Page 2)

FROM: K. Campbell (KC)

SUBJECT: RCRA/NJ Hazardous Waste Codes

REFERENCE

Waste Code Numbers X722, X725, and X750 (as cited in Ref No. 14, pp. 2-5, 2-6, 2-37 through 2-40) apply to State of New Jersey Hazardous Waste Codes. Waste Code Numbers X722 and X725 apply to waste oils; Waste Code Number X750 applies to PCB-contaminated liquid containing greater than 50 ppm by dry weight of PCBs (Attachment B).

code of federal regulations

Protection of Environment

40

PARTS 260 to 299

Revised as of July 1, 1992

CONTAINING
A CODIFICATION OF DOCUMENTS
OF GENERAL APPLICABILITY
AND FUTURE EFFECT

AS OF JULY 1, 1992

With Ancillaries

Published by
the Office of the Federal Register
National Archives and Records
Administration

as a Special Edition of
the Federal Register

Ref. 38

Att. A, p. 1

harmful constituents and the rate of degradation.

(vi) The degree to which the constituent or any degradation product of the constituent bioaccumulates in ecosystems.

(vii) The plausible types of improper management to which the waste could be subjected.

(viii) The quantities of the waste generated at individual generation sites or on a regional or national basis.

(ix) The nature and severity of the human health and environmental damage that has occurred as a result of the improper management of wastes containing the constituent.

(x) Action taken by other governmental agencies or regulatory programs based on the health or environmental hazard posed by the waste or waste constituent.

(xi) Such other factors as may be appropriate.

Substances will be listed on appendix VIII only if they have been shown in scientific studies to have toxic, carcinogenic, mutagenic or teratogenic effects on humans or other life forms.

(Wastes listed in accordance with these criteria will be designated Toxic wastes.)

(b) The Administrator may list classes or types of solid waste as hazardous waste if he has reason to believe that individual wastes, within the class or type of waste, typically or frequently are hazardous under the definition of hazardous waste found in section 1004(5) of the Act.

(c) The Administrator will use the criteria for listing specified in this section to establish the exclusion limits referred to in § 261.5(c).

[45 FR 33119, May 19, 1980, as amended at 55 FR 18726, May 4, 1990; 67 FR 14, Jan. 2, 19921

Subpart C—Characteristics of Hazardous Waste

§ 261.20 General.

(a) A solid waste, as defined in § 261.2, which is not excluded from regulation as a hazardous waste under § 261.4(b), is a hazardous waste if it exhibits any of the characteristics identified in this subpart.

[*Comment:* § 262.11 of this chapter sets forth the generator's responsibility to determine whether his waste exhibits one or more of the characteristics identified in this subpart]

(b) A hazardous waste which is identified by a characteristic in this subpart is assigned every EFA Hazardous Waste Niunber that is applicable as set forth in this subpart. This number must be used in complying with the notification requirements of section 3010 of the Act and all applicable recordkeeping and reporting requirements under parts 262 through 265, 268, and 270 of this chapter.

(c) For purposes of this subpart, the Administrator will consider a sample obtained using any of the applicable sampling methods specified in appendix I to be a representative sample within the meaning of part 260 of this chapter.

[*Comment:* Since the appendix I sampling methods are not being formally adopted by the Administrator, a person who desires to employ an alternative sampling method is not required to demonstrate the equivalency of his method under the procedures set forth in §§ 260.20 and 260.21.)

[45 FR 33119, May 19, 1980, as amended at 51 FR 40636, Nov. 7, 1986; 55 FR 22684, June 1, 1990; 56 FR 3876, Jan. 31, 19911

§ 261.21 Characteristic of ignitability.

(a) A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

(1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by voliune and has flash point less than 60°C (140°F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or D-93-80 (incorporated by reference, see § 260.11), or a Setaflash-Closed Cup Tester, using the test method specified In ASTM Standard D-3278-78 (incorporated by reference, see § 260.11), or as determined by an equivalent test method approved by the Administrator under procedures set forth in §§ 260.20 and 260.21.

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous

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chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

(3) It is an ignitable compressed gas as defined in 49 CFR 173.300 and as determined by the test methods described in that regulation or equivalent test methods approved by the Administrator under §§ 260.20 and 260.21.

(4) It is an oxidizer as defined in 49 CFR 173.151.

(b) A solid waste that exhibits the characteristic of ignitability has the EPA Hazardous Waste Number of D001.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990]

§ 261.22 Characteristic of corrosivity.

(a) A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

(1) It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using either an EPA test method or an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21. The EPA test method for pH is specified as Method 5.2 in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (incorporated by reference, see § 260.11).

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM-01-69 as standardized in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (incorporated by reference, see § 260.11) or an equivalent test method approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21.

(b) A solid waste that exhibits the characteristic of corrosivity has the EPA Hazardous Waste Number of D002.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990]

§ 261.23 Characteristic of reactivity.

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties:

(1) It is normally unstable and readily undergoes violent change without detonating.

(2) It reacts violently with water.

(3) It forms potentially explosive mixtures with water.

(4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.6, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

(6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

(7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

(b) A solid waste that exhibits the characteristic of reactivity has the EPA Hazardous Waste Number of D003.

[45 FR 33119, May 19, 1980, as amended at 55 FR 22684, June 1, 1990]

§ 261.24 Toxicity characteristic.

(a) A solid waste exhibits the characteristic of toxicity if, using the test methods described in appendix II or equivalent methods approved by the Administrator under the procedures set forth in §§ 260.20 and 260.21, the extract from a representative sample of the waste contains any of the contaminants listed in table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in appendix II, is considered to be the extract for the purpose of this section.

(b) A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table I which corresponds to the toxic contaminant causing it to be hazardous.

TABLE 1—MAXIMUM CONCENTRATION OF CONTAMINANTS FOR THE TOXICITY CHARACTERISTIC

EPA HW No.[1]	Contaminant	CAS No.[2]	Regulatory Level (mg/L)
D004	Arsenic	7440-38-2	5.0
D005	Barium	7440-39-3	100.0
D018	Benzene	71-43-2	0.5
D006	Cadmium	7440-43-9	1.0
D019	Carbon tetrachloride	56-23-5	0.5
D020	Chlordane	57-74-9	0.03
D021	Chlorobenzene	108-90-7	100.0
D022	Chloroform	67-66-3	6.0
D007	Chromium	7440-47-3	5.0
D023	o-Cresol	95-48-7	[4] 200.0
D024	m-Cresol	108-39-4	[4] 200.0
D025	p-Cresol	106-44-5	[4] 200.0
D026	Cresol		[4] 200.0
D016	2,4-D	94-75-7	10.0
D027	1,4-Dichlorobenzene	106-46-7	7.5
D028	1,2-Dichloroethane	107-06-2	0.5
D029	1,1-Dichloroethylene	75-35-4	0.7
D030	2,4-Dinitrotoluene	121-14-2	[3] 0.13
D012	Endrin	72-20-8	0.02
D031	Heptachlor (and its epoxide).	76-44-8	0.008
D032	Hexachlorobenzene	118-74-1	[3] 0.13
D033	Hexachlorobutadiene	87-68-3	0.5
D034	Hexachloroethane	67-72-1	3.0
D008	Lead	7439-92-1	5.0
D013	Lindane	58-89-9	0.4
D009	Mercury	7439-97-6	0.2
D014	Methoxychlor	72-43-5	10.0
D035	Methyl ethyl ketone	78-93-3	200.0
D036	Nitrobenzene	98-95-3	2.0
D037	Pentrachlorophenol	87-86-5	100.0
D038	Pyridine	110-86-1	[4] 5.0
D010	Selenium	7782-49-2	1.0
D011	Silver	7440-22-4	5.0
D039	Tetrachloroethylene	127-18-4	0.7
D015	Toxaphene	8001-35-2	0.5
D040	Trichloroethylene	79-01-6	0.5
D041	2,4,5-Trichlorophonol	95-95-4	400.0
D042	2,4,6-Trichlorophenol	88-06-2	2.0
D017	2,4,5-TP (Silvex)	93-72-1	1.0
D043	Vinyl chloride	75-01-4	0.2

[1] Hazardous waste number.
[2] Chemical abstracts service number.
[3] Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.
[4] If o-, m-, and p-Cresol concentrations cannot bo differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

[55 FR 11862, Mar. 29, 1990, as amended at 55 FR 22684, June 1, 1990; 55 FR 2698 June 29, 1990]

Subpart D—Lists of Hazardous Wastes

§ 261.30 General.

(a) A solid waste is a hazardo waste if it is listed in this subpar unless it has been excluded from th list under §§ 260.20 and 260.22.

(b) The Administrator will indica his basis for listing the classes or typ of wastes listed in this subpart by em ploying one or more of the followin Hazard Codes:

Ignitable Waste ..... (I)
Corrosive Waste ..... (C)
Reactive Waste ..... (R)
Toxicity Characteristic Waste ..... (E)
Acute Hazardous Waste ..... (H)
Toxic Waste ..... (T)

Appendix VII identifies the constit ent which caused the Administrator list the waste as a Toxicity Characte istic Waste (E) or Toxic Waste (T) §§ 261.31 and 261.32.

(c) Each hazardous waste listed this subpart is assigned an EPA Ha ardous Waste Number which preced the name of the waste. This numb must be used in complying with t notification requirements of Sectio 3010 of the Act and certain recor keeping and reporting requiremen under parts 262 through 265, 268, ar part 270 of this chapter.

(d) The following hazardous wast listed in § 261.31 or § 261.32 are subje to the exclusion limits for acutely ha ardous wastes established in § 261. EPA Hazardous Wastes Nos. FO2 FO21, FO22, PO23, PO26, and FO27.

[45 FR 33119, May 19, 1980, as amended 48 FR 14294, Apr. 1, 1983; 50 FR 2000, Ja 14, 1985; 51 FR 40636, Nov. 7, 1986; 55 F 11863, Mar. 29, 1990]

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§ 261.31 Hazardous wastes from non-specific sources.

(a) The following solid wastes are listed hazardous wastes from non-specific sources unless they are excluded under §§ 260.20 and 260.22 and listed in appendix IX.

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
Generic:		
→ F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
→ F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)*
→ F004	The following spent non-halogenated solvents: Cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of those spent solvents and spent solvent mixtures.	(T)
→ F005	The following spent non-halogenated solvents: Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I,T)
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	(T)
F007	Spent cyanide plating bath solutions from electroplating operations	(R, T)
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	(R, T)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	(R, T)
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	(R, T)
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	(R, T)
F012	Quenching waste water treatment sludges from metal heat treating operations where cyanides are used in the process.	(T)
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive conversion coating process.	(T)
F020	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol.).	(H)
F021	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.	(H)

Industry and EPA hazardous waste No.	Hazardous waste	H
F022	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.	(H)
F023	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol.).	(H)
F024	Process wastes, including but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes, from the production of certain chlorinated aliphatic hydrocarbons by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. (This listing does not include wastewaters, wastewater treatment sludges, spent catalysts, and wastes listed in § 261.31 or § 261.32.).	(T)
F025	Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.	(T)
F026	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	(H)
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing Hexachlorophene sythesized from prepuritied 2,4,5-trichlorophenol as the sole component.).	(H)
F028	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027.	(T)
F032 [1]	Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations (except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with § 261.35 of this chapter and where the generator does not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol. (NOTE: The listing of wastewaters that have not come into contact with process contaminants is stayed administratively. The listing for plants that have previously used chlorophenolic formulations is administratively stayed whenever these wastes are covered by the F034 or F035 listings. These stays will remain in effect until further administrative action is taken.).	(T)
F034 [1]	Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving process generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol. (NOTE: The listing of wastewaters that have not come into contact with process contaminants is stayed administratively. The stay will remain in effect until further administrative action is taken.).	(T)
F035 [1]	Wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving process generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol. (NOTE: The listing of wastewaters that have not come into contact with process contaminants is stayed administratively. The stay will remain in effect until further administrative action is taken.).	(T)
F037	Petroleum refinery primary oil/water/solids separation sludge—Any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oily cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in: oil/water/solids separators; tanks and impoundments; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludge generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges generated in aggressive biological treatment units as defined in § 261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and K051 wastes are not included in this listing.	(T)

considers the residue to be intended for discard, and thus, a hazardous waste. An example of a legitimate re-use of the residue would be where the residue remains in the container and the container is used to hold the same commercial chemical product or manufacturing chemical intermediate it previously held. An example of the discard of the residue would be where the drum is sent to a drum reconditioner who reconditions the drum but discards the residue.]

(d) Any residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any commercial chemical product or manufacturing chemical intermediate having the generic name listed in paragraph (e) or (f) of this section, or any residue or contaminated soil, water or other debris resulting from the cleanup of a spill, into or on any land or water, of any off-specification chemical product and manufacturing chemical intermediate which, if it met specifications, would have the generic name listed in paragraph (e) or (f) of this section.

[*Comment:* The phrase "commercial chemical product or manufacturing chemical intermediate having the generic name listed in . . ." refers to a chemical substance which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in paragraph (e) or (f). Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in paragraph (e) or (f), such waste will be listed in either § 261.31 or § 261.32 or will be identified as a hazardous waste by the characteristics set forth in subpart C of this part.]

(e) The commercial chemical products, manufacturing chemical intermediates or off-specification commercial chemical products or manufacturing chemical intermediates referred to in paragraphs (a) through (d) of this section, are identified as acute hazardous wastes (H) and are subject to be the small quantity exclusion defined in § 261.5(e).

[*Comment:* For the convenience of the regulated community the primary hazardous properties of these materials have been indicated by the letters T (Toxicity), and R (Reactivity). Absence of a letter indicates that the compound only is listed for acute toxicity.]

These wastes and their corresponding EPA Hazardous Waste Numbers are:

Hazardous waste No.	Chemical abstracts No.	Substance
P023	107-20-0	Acetaldehyde, chloro-
P002	591-08-2	Acetamide, N-(aminothioxomethyl)-
P057	840-19-7	Acetamide, 2-fluoro-
P055	62-74-8	Acetic acid, fluoro-, sodium salt
P002	591-08-2	1-Acetyl-2-thiourea
P003	107-02-8	Acrolein
P070	116-06-3	Aldicarb
P004	309-00-2	Aldrin
P005	107-18-6	Allyl alcohol
P006	20859-73-8	Aluminum phosphide (R,T)
P007	2763-96-4	5-(Aminomethyl)-3-isoxazolol
P008	504-24-5	4-Aminopyridine
P009	131-74-8	Ammonium picrate (R)
P119	7803-55-6	Ammonium vanadate
P099	506-61-6	Argentate(1-), bis(cyano-C)-, potassium
P010	7778-39-4	Arsenic acid H_3AsO_4
P012	1327-53-3	Arsenic oxide As_2O_3
P011	1303-28-2	Arsenic oxide As_2O_5
P011	1303-28-2	Arsenic pentoxide
P012	1327-53-3	Arsenic trioxide
P038	692-42-2	Arsine, diethyl-
P036	696-26-6	Arsonous dichloride, phenyl-
P054	151-56-4	Aziridine
P067	75-55-6	Aziridine, 2-methyl-
P013	542-62-1	Barium cyanide
P024	106-47-8	Benzenamine, 4-chloro-

Hazardous waste No.	Chemical abstracts No.	Substance
P077	100-01-6	Benzenamine, 4-nitro-
P028	100-44-7	Benzene, (chloromethyl)-
P042	51-43-4	1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-, (R)-
P046	122-09-8	Benzeneethanamine, alpha,alpha-dimethyl-
P014	108-98-5	Benzenethiol
P001	[1] 81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations greater than 0.3%
P028	100-44-7	Benzyl chloride
P015	7440-41-7	Beryllium
P017	598-31-2	Bromoacetone
P018	357-57-3	Brucine
P045	39196-18-4	2-Butanone, 3,3-dimethyl-1-(methylthio)-, O-[(methylamino)carbonyl] oxime
P021	592-01-8	Calcium cyanide
P021	592-01-8	Calcium cyanide $Ca(CN)_2$
P022	75-15-0	Carbon disulfide
P095	75-44-5	Carbonic dichloride
P023	107-20-0	Chloroacetaldehyde
P024	106-47-8	p-Chloroaniline
P026	5344-82-1	1-(o-Chlorophenyl)thiourea
P027	542-76-7	3-Chloropropionitrile
P029	544-92-3	Copper cyanide
P029	544-92-3	Copper cyanide Cu(CN)
P030	.....	Cyanides (soluble cyanide salts), not otherwise specified
P031	460-19-5	Cyanogen
P033	506-77-4	Cyanogen chloride
P033	506-77-4	Cyanogen chloride (CN)Cl
P034	131-89-5	2-Cyclohexyl-4,6-dinitrophenol
P016	542-88-1	Dichloromethyl ether
P036	696-28-6	Dichlorophenylarsine
P037	60-57-1	Dieldrin
P038	692-42-2	Diethylarsine
P041	311-45-5	Diethyl-p-nitrophenyl phosphate
P040	297-97-2	O,O-Diethyl O-pyrazinyl phosphorothioate
P043	55-91-4	Diisopropylfluorophosphate (DFP)
P004	309-00-2	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a,-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha,8abeta)-
P060	465-73-6	1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexa- chloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,6beta,8abeta)-
P037	60-57-1	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta,6aalpha,7beta, 7aalpha)-
P051	[1] 72-20-8	2,7:3,6-Dimethanooaphth [2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2abeta,3alpha,6alpha,6abeta,7beta, 7aalpha)-, a metabolites
P044	60-51-5	Dimethoate
P046	122-09-8	alpha,alpha-Dimethylphenethylamine
P047	[1] 534-52-1	4,6-Dinitro-o-cresol, & salts
P048	51-28-5	2,4-Dinitrophenol
P020	88-85-7	Dinoseb
P085	152-16-9	Diphosphoramide, octamethyl-
P111	107-49-3	Diphosphoric acid, tetraethyl ester
P039	298-04-4	Disulfoton
P049	541-53-7	Dithiobiuret
P050	115-29-7	Endosulfan
P088	145-73-3	Endothall
P051	72-20-8	Endrin
P051	72-20-8	Endrin, & metabolites
P042	51-43-4	Epinephrine
P031	460-19-5	Ethanedinitrile
P066	16752-77-5	Ethanimidothioic acid, N-[[(methylamino)carbonyl]oxy]-, methyl ester
P101	107-12-0	Ethyl cyanide
P054	151-56-4	Ethylenimine
P097	52-85-7	Famphur
P056	7782-41-4	Fluorine
P057	640-19-7	Fluoroacetamide
P058	62-74-8	Fluoroacetic acid, sodium salt
P065	628-86-4	Fulminic acid, mercury(2+) salt (R,T)
P059	76-44-8	Heptachlor
P062	757-58-4	Hexaethyl tetraphosphate

Ref 38

Hazardous waste No.	Chemical abstracts No.	Substance
U001	75-07-0	Acetaldehyde (I)
U034	75-87-6	Acetaldehyde, trichloro-
U187	62-44-2	Acetamide, N-(4-ethoxyphenyl)-
U005	53-96-3	Acetamide, N-9H-fluoren-2-yl-
U240	[1] 94-75-7	Acetic acid, (2,4-dichlorophenoxy)-, salts & esters
U112	141-78-6	Acetic acid ethyl ester (I)
U144	301-04-2	Acetic acid, lead(2+) salt
U214	563-68-8	Acetic acid, thallium(1+) salt
see F027	93-76-5	Acetic acid, (2,4,5-trichlorophenoxy)-
U002	67-64-1	Acetone (I)
U003	75-05-8	Acetonitrile (I,T)
U004	98-86-2	Acetophenone
U005	53-96-3	2-Acetylaminofluorene
U006	75-36-5	Acetyl chloride (C,R,T)
U007	79-06-1	Acrylamide
U008	79-10-7	Acrylic acid (I)
U009	107-13-1	Acrylonitrile
U011	61-82-5	Amitrole
U012	62-53-3	Aniline (I,T)
U136	75-60-5	Arsinic acid, dimethyl-
U014	492-80-8	Auramine
U015	115-02-6	Azaserine
U010	50-07-7	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,6,6a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1aalpha, 8beta,8aalpha,8balpha)]-
U157	56-49-5	Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-
U016	225-51-4	Benz[c]acridine
U017	98-87-3	Benzal chloride
U192	23950-58-5	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-
U018	56-55-3	Benz[a]anthracene
U094	57-97-6	Benz[a]anthracene, 7,12-dimethyl-
U012	62-53-3	Benzenamine (I,T)
U014	492-80-8	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-
U049	3165-93-3	Benzenamine, 4-chloro-2-methyl-, hydrochloride
U093	60-11-7	Benzenamine, N,N-dimethyl-4-(phenylazo)-
U328	95-53-4	Benzenamine, 2-methyl-
U353	106-49-0	Benzenamine, 4-methyl-
U158	101-14-4	Benzenamine, 4,4'-methylenebis[2-chloro-
U222	636-21-5	Benzenamine, 2-methyl-, hydrochloride
U181	99-55-8	Benzenamine, 2-methyl-5-nitro-
U019	71-43-2	Benzene (I,T)
U038	510-15-6	Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester
U030	101-55-3	Benzene, 1-bromo-4-phenoxy-
U035	305-03-3	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-
→ U037	108-90-7	Benzene, chloro-
U221	25376-45-8	Benzenediamine, ar-methyl-
U028	117-81-7	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
U069	84-74-2	1,2-Benzenedicarboxylic acid, dibutyl ester
U088	84-66-2	1,2-Benzenedicarboxylic acid, diethyl ester
U102	131-11-3	1,2-Benzenedicarboxylic acid, dimethyl ester
U107	117-84-0	1,2-Benzenedicarboxylic acid, dioctyl ester
U070	95-50-1	Benzene, 1,2-dichloro-
U071	541-73-1	Benzene, 1,3-dichloro-
U072	106-46-7	Benzene, 1,4-dichloro-
U060	72-54-8	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-
U017	98-87-3	Benzene, (dichloromethyl)-
U223	26471-62-5	Benzene, 1,3-diisocyanatomethyl- (R,T)
U239	1330-20-7	Benzene, dimethyl- (I,T)
U201	108-46-3	1,3-Benzenediol
U127	118-74-1	Benzene, hexachloro-
U056	110-82-7	Benzene, hexahydro- (I)
U220	108-88-3	Benzene, methyl-
U105	121-14-2	Benzene, 1-methyl-2,4-dinitro-
U106	606-20-2	Benzene, 2-methyl-1,3-dinitro-
U055	98-82-8	Benzene, (1-methylethyl)- (I)
U169	98-95-3	Benzene, nitro-
U183	606-93-5	Benzene, pentachloro-
U185	62-68-8	Benzene, pentachloronitro-
U020	98-09-9	Benzenesulfonic acid chloride (C,R)
U020	98-09-9	Benzenesulfonyl chloride (C,R)

Hazardous waste No.	Chemical abstracts No.	Substance
U207	95-94-3	Benzene, 1,2,4,5-tetrachloro-
U061	50-29-3	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-
U247	72-43-5	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4- methoxy-
U023	98-07-7	Benzene, (trichloromethyl)-
U234	99-35-4	Benzene, 1,3,5-trinitro-
U021	92-87-5	Benzidine
U202	[1] 81-07-2	1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide, & salts
U203	94-59-7	1,3-Benzodioxole, 5-(2-propenyl)-
U141	120-58-1	1,3-Benzodioxole, 5-(1-propenyl)-
U090	94-58-6	1,3-Benzodioxole, 5-propyl-
U064	189-55-9	Benzo[rst]pentaphene
U248	[1] 81-81-2	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts, when present at concentrations of 0.3% or less
U022	50-32-8	Benzo[a]pyrene
U197	106-51-4	p-Benzoquinone
U023	98-07-7	Benzotrichloride (C,R,T)
U085	1464-53-5	2,2'-Bioxirane
U021	92-87-5	[1,1'-Biphenyl]-4,4'-diamine
U073	91-94-1	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dichloro-
U091	119-90-4	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-
U095	119-93-7	[1,1'-Biphenyl]-4,4'-diamine, 3,3'-dimethyl-
U225	75-25-2	Bromoform
U030	101-55-3	4-Bromophenyl phenyl ether
U128	87-68-3	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-
U172	924-16-3	1-Butanamine, N-butyl-N-nitroso-
→ U031	71-36-3	1-Butanol (I)
U159	78-93-3	2-Butanone (I,T)
U160	1338-23-4	2-Butanone, peroxide (R,T)
U053	4170-30-3	2-Butenal
U074	764-41-0	2-Butene, 1,4-dichloro- (I,T)
U143	303-34-4	2-Butenoic acid, 2-methyl-, 7-[[(2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(Z),7(2S*,3R*),7aalpha]]-
U031	71-36-3	n-Butyl alcohol (I)
U136	75-60-5	Cacodylic acid
U032	13765-19-0	Calcium chromate
U238	51-79-6	Carbamic acid, ethyl ester
U178	615-53-2	Carbamic acid, methylnitroso-, ethyl ester
U097	79-44-7	Carbamic chloride, dimethyl-
U114	[1] 111-54-6	Carbamodithioic acid, 1,2-ethanediylbis-, salts & esters
U062	2303-16-4	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester
U215	6533-73-9	Carbonic acid, dithallium(1+) salt
U033	353-50-4	Carbonic difluoride
U156	79-22-1	Carbonochloridic acid, methyl ester (I,T)
U033	353-50-4	Carbon oxyfluoride (R,T)
→ U211	56-23-5	Carbon tetrachloride
U034	75-87-6	Chloral
U035	305-03-3	Chlorambucil
U036	57-74-9	Chlordane, alpha & gamma isomers
U026	494-03-1	Chlornaphazin
U037	108-90-7	Chlorobenzene
U038	510-15-6	Chlorobenzilate
U039	59-50-7	p-Chloro-m-cresol
U042	110-75-8	2-Chloroethyl vinyl ether
U044	67-66-3	Chloroform
U046	107-30-2	Chloromethyl methyl ether
U047	91-58-7	beta-Chloronaphthalene
U048	95-57-8	o-Chlorophenol
U049	3165-93-3	4-Chloro-o-toluidine, hydrochloride
U032	13765-19-0	Chromic acid H_2CrO_4, calcium salt
U050	218-01-9	Chrysene
U051	.....	Creosote
→ U052	1319-77-3	Cresol (Cresylic acid)
U053	4170-30-3	Crotonaldehyde
U055	98-82-8	Cumene (I)
U246	506-68-3	Cyanogen bromide (CN)Br
U197	106-51-4	2,5-Cyclohexadiene-1,4-dione
U056	110-82-7	Cyclohexane (I)

Att. A, p. 6

Hazardous waste No.	Chemical abstracts No.	Substance
U150	148-82-3	Melphalan
U151	7439-97-6	Mercury
U152	126-98-7	Methacrylonitrile (I, T)
U092	124-40-3	Methanamine, N-methyl- (I)
U029	74-83-9	Methane, bromo-
U045	74-87-3	Methane, chloro- (I, T)
U046	107-30-2	Methane, chloromethoxy-
U068	74-95-3	Methane, dibromo-
U080	75-09-2	Methane, dichloro-
U075	75-71-8	Methane, dichlorodifluoro-
U138	74-88-4	Methane, iodo-
U119	62-50-0	Methanesulfonic acid, ethyl ester
U211	56-23-5	Methane, tetrachloro-
U153	74-93-1	Methanethiol (I, T)
U225	75-25-2	Methane, tribromo-
U044	67-66-3	Methane, trichloro-
U121	75-69-4	Methane, trichlorofluoro-
U036	57-74-9	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-
U154	67-56-1	Methanol (I)
U155	91-80-5	Methapyrilene
U142	143-50-0	1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachloroctahydro-
U247	72-43-5	Methoxychlor
U154	67-56-1	Methyl alcohol (I)
U029	74-83-9	Methyl bromide
U186	504-60-9	1-Methylbutadiene (I)
U045	74-87-3	Methyl chloride (I,T)
U156	79-22-1	Methyl chlorocarbonate (I,T)
→ U226	71-55-6	Methyl chloroform
U157	56-49-5	3-Methylcholanthrene
U158	101-14-4	4,4'-Methylenebis(2-chloroaniline)
U068	74-95-3	Methylene bromide
U080	75-09-2	Methylene chloride
U159	78-93-3	Methyl ethyl ketone (MEK) (I,T)
U160	1338-23-4	Methyl ethyl ketone peroxide (R,T)
U138	74-88-4	Methyl iodide
U161	108-10-1	Methyl isobutyl ketone (I)
U162	80-62-6	Methyl methacrylate (I,T)
U161	108-10-1	4-Methyl-2-pentanone (I)
U164	56-04-2	Methylthiouracil
U010	50-07-7	Mitomycin C
U059	20830-81-3	5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (SS-cis)-
U167	134-52-7	1-Naphthalenamine
U168	91-59-8	2-Naphthalenamine
U026	494-03-1	Naphthalenamine, N,N'-bis(2-chloroethyl)-
U165	91-20-3	Naphthalene
U047	91-58-7	Naphthalene, 2-chloro-
U166	130-15-4	1,4-Naphthalenedione
U236	72-57-1	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo)bis[5-amino-4-hydroxy]-, tetrasodium salt
U166	130-15-4	1,4-Naphthoquinone
U167	134-32-7	alpha-Naphthylamine
U168	91-59-8	beta-Naphthylamine
U217	10102-45-1	Nitric acid, thallium(1+) salt
U169	98-95-3	Nitrobenzene (I,T)
U170	100-02-7	p-Nitrophenol
U171	79-46-9	2-Nitropropane (I,T)
U172	924-16-3	N-Nitrosodi-n-butylamine
U173	1116-54-7	N-Nitrosodiethanolamine
U174	55-18-5	N-Nitrosodiethylamine
U176	759-73-9	N-Nitroso-N-ethylurea
U177	684-93-5	N-Nitroso-N-methylurea
U178	615-53-2	N-Nitroso-N-methylurethane
U179	100-75-4	N-Nitrosopiperidine
U180	930-55-2	N-Nitrosopyrrolidine
U181	99-55-8	5-Nitro-o-toluidine
U193	1120-71-4	1,2-Oxathiolane, 2,2-dioxide
U058	50-18-0	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide
U115	75-21-8	Oxirane (I,T)

Hazardous waste No.	Chemical abstracts No.	Substance
U126	765-34-4	Oxiranecarboxyaldehyde
U041	106-89-8	Oxirane, (chloromethyl)-
U182	123-63-7	Paraldehyde
U183	608-93-5	Pentachlorobenzene
U184	76-01-7	Pentachloroethane
U185	82-68-8	Pentachloronitrobenzene (PCNB)
See F027	87-86-5	Pentachlorophenol
U161	108-10-1	Pentanol, 4-methyl-
U186	504-60-9	1,3-Pentadiene (I)
U187	62-44-2	Phenacetin
→ U188	108-95-2	Phenol
U048	95-57-8	Phenol, 2-chloro-
U039	59-50-7	Phenol, 4-chloro-3-methyl-
U081	120-83-2	Phenol, 2,4-dichloro-
U082	87-65-0	Phenol, 2,6-dichloro-
U089	56-53-1	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)-
U101	105-67-9	Phenol, 2,4-dimethyl-
U052	1319-77-3	Phenol, methyl-
U132	70-30-4	Phenol, 2,2'-methylenebis[3,4,6-trichloro-
U170	100-02-7	Phenol, 4-nitro-
See F027	87-86-5	Phenol, pentachloro-
See F027	58-90-2	Phenol, 2,3,4,6-tetrachloro-
See F027	95-95-4	Phenol, 2,4,5-trichloro-
See F027	88-06-2	Phenol, 2,4,6-trichloro-
U150	148-82-3	L-Phenylalanine, 4-[bis(2-chloroethyl)amine]-
U145	7446-27-7	Phosphoric acid, lead(2+) salt (2:3)
U087	3288-58-2	Phosphorodithioic acid, O,O-diethyl S-methyl ester
U189	1314-80-3	Phosphorus sulfide (R)
U190	85-44-9	Phthalic anhydride
U191	109-06-8	2-Picoline
U179	100-75-4	Piperidine, 1-nitroso-
U192	23950-58-5	Pronamide
U194	107-10-8	1-Propanamine (I,T)
U111	621-64-7	1-Propanamine, N-nitroso-N-propyl-
U110	142-84-7	1-Propanamine, N-propyl- (I)
U066	96-12-8	Propane, 1,2-dibromo-3-chloro-
U083	78-87-5	Propane, 1,2-dichloro-
U149	109-77-3	Propanedinitrile
U171	79-46-9	Propane, 2-nitro- (I,T)
U027	108-60-1	Propane, 2,2'-oxybis(2-chloro-
U193	1120-71-4	1,3-Propane sultone
See F027	93-72-1	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-
U235	126-72-7	1-Propanol, 2,3-dibromo-, phosphate (3:1)
U140	78-83-1	1-Propanol, 2-methyl- (I,T)
U002	67-64-1	2-Propanone (I)
U007	79-06-1	2-Propenamide
U084	542-75-6	1-Propene, 1,3-dichloro-
U243	1888-71-7	1-Propene, 1,1,2,3,3,3-hexachloro-
U009	107-13-1	2-Propenonitrile
U152	126-98-7	2-Propenonitrile, 2-methyl- (I,T)
U008	79-10-7	2-Propenoic acid (I)
U113	140-88-5	2-Propenoic acid, ethyl ester (I)
U118	97-63-2	2-Propenoic acid, 2-methyl-, ethyl ester
U162	80-62-6	2-Propenoic acid, 2-methyl-, methyl ester (I,T)
U194	107-10-8	n-Propylamine (I,T)
U083	78-87-5	Propylene dichloride
U148	123-33-1	3,6-Pyridazinedione, 1,2-dihydro-
U196	110-86-1	Pyridine
U191	109-06-8	Pyridine, 2-methyl-
U237	66-75-1	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amine]-
U164	56-04-2	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-
U180	930-55-2	Pyrrolidine, 1-nitroso-
U200	50-55-5	Reserpine

WESTON

Joann L. Wagner
Originator

PHONE CONVERSATION RECORD

Conversation with:

Date 05 / 02 / 97

Name Shih Chang

Time 1435 hrs AM/PM

Company NJDEP, Div. of Solid and Hazardous Waste, Bureau of Resource Recovery and Technical Programs

Address 401 East State Street
Trenton, NJ 08625

☑ Originator Placed Call

☐ Originator Received Call

Phone (609) 292-8341

W.O. NO. 1284

Subject NJ State Waste Codes

Notes: I called to verify the designations for the hazardous waste codes shown on the attached page; the original copy of the document from which the attached was obtained is no longer available. Mr. Chang said that X722, X725, and X750 waste codes as listed were correct. However, as of October 21, 1996, new waste codes went into effect, replacing those shown on the attached (the new codes were published in the New Jersey Register dated October 21, 1996).

☑ File Borne Chemical Co. TDD No. 02-9603-0020

☐ Tickle File ____ / ____ / ____

☐ Follow-Up By:

☐ Copy/Route To:

Follow-Up-Action:

Originator's Initials [initials]

Ref. 38

Att. B, p. 1

REW 110 4-83

NEW JERSEY HAZARDOUS WASTE CODES

NJ Hazardous Waste Number	Hazardous Waste
X721	Waste automotive crankcase and lubricating oils from automotive service and gasoline stations, truck terminals, and garages
→ X722	Waste oil and bottom sludge generated from tank cleanouts from residential/commercial fuel oil tanks
X723	Waste oil and bottom sludge generated by gasoline stations when gasoline and oil tanks are tested, cleaned, or replaced
X724	Waste petroleum oil generated when tank trucks or other vehicles or mobile vessels are cleaned, including, but not limited to, oily ballast water from product transport units of boats, barges, ships or other vessels.
→ X725	Oil spill cleanup residue which: A. is contaminated beyond saturation; or B. the generator fails to demonstrate that the spill material was not one of the listed hazardous waste oils
X726	The following used and unused waste oils: metal working oils; turbine lubricating oils; diesel lubricating oils; and quenching oils
X728	Bottom sludge generated from the processing, blending, and treatment of waste oil in waste oil processing facilities
→ X750	PCB-contaminated liquids containing 50 ppm or more by dry weight of PCBs. 5/2/97
X751	PCB-contaminated solids containing 50 ppm or more of PCBs by weight.
X752	Drained electrical, hydraulic, or other equipment which contained liquids with 50 ppm or more of PCBs by weight.
X753	Undrained electrical, hydraulic, or other equipment containing liquids with 50 ppm or more of PCBs by weight.
X754	PCB-contaminated sludge or dredge material with 30 ppm or more of PCBs by weight.

Ref. 38

Att. B, p. 2

REFERENCE NO. 39

Surface Water Quality Standards

N.J.A.C. 7:9B

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND ENERGY

Office of Land and Water Planning
April 1994

"Disinfection" means the removal, destruction, or inactivation of pathogenic and indicator organisms.

"DRBC" means Delaware River Basin Commission.

"EC50" means the median effective concentration of a toxic substance expressed as a statistical estimate of the concentration that has a specified adverse effect on 50 percent of the test organisms under specified test conditions, based on the results of an acute bioassay.

"Epilimnion" means the freely circulating upper region of a thennaily stratified waterbody extending from the surface to the thermocline.

"Existing uses" means those uses actually attained in the watertxxJy on or after November 28, 1975, whether or not they are included in the Surface Water Quality Standards.

"Federal Act" means the "Federal Water Pollution Control Act" (33 U.S.C. § 1251 et seq.) including all subsequent supplements and amendments.

"Flow-through bioassay" means a toxicity test in which the test solutions flow into and out of the test chambers on a once-through basis for the duration of the test, in accordance with N.J.A.C. 7:18.

"Fresh water(s)" means all nontidal and tidal waters generally having a salinity, due to natural sources, of less than or equal to 3.5 parts per thousand at mean high tide.

"FW" means the general surface water classification applied to fresh waters.

"FW1" means those fresh waters that originate in and are wholly within Federal or State parks, forests, fish and wildlife lands and other special holdings, that are to be maintained in their natural state of quality (set aside for posterity) and not subjected to any man-made wastewater discharges, as designated in N.J.A.C. 7:9B-1.15(h) Table 6.

"FW2" means the general surface water classification applied to those fresh waters that are not designated as FW1 or Pinelands Waters.

"Groundwater" means that portion of water beneath the land surface that is within the zone of saturation (below the water table) where pore spaces are filled with water.

"Heat dissipation area" means a mixing zone, as may be designated by the Department, into which thermal effluents may be discharged for the purpose of mixing, dispersing, or dissipating such effluents without creating nuisances, hazardous conditions, or violating the provisions of this subchapter.

"Measurable changes" means changes measured or determined by a biological, chemical, physical, or analytical method, conducted in accordance with USEPA approved methods as identified in 40 C.F.R. 136 or other analytical methods (for example, mathematical models, ecological indices, etc.) approved by the Department, that might adversely impact a water use (including, but not limited to aesthetics).

"Mixing zones" means localized areas of surface waters, as may be designated by the Department, into which wastewater effluents may be discharged for the purpose of mixing, dispersing, or dissipating such effluents without creating nuisances or hazardous conditions, or violating the provisions of this subchapter.

"Natural flow" means the water flow that would exist in a waterway without the addition of flow of artificial origin.

"Natural water quality" means the water quality that would exist in a waterway or a waterbody without the addition of water or waterborne substances from artificial origin.

"NJPDES" means New Jersey Pollutant Discharge Elimination System.

"NOEC" means the "no observable effect concentration", which is the highest concentration of a toxic substance that has no adverse effect(s) on survival, growth, or reproduction of species based upon the results of chronic toxicity testing.

"Nondegradation waters" means those waters set aside for posterity because of their clarity, color, scenic setting, other characteristic of aesthetic value, unique ecological significance, exceptional recreational significance, or exceptional water supply significance. These waters include all waters designated as FW1 in this subchapter.

"Nonpersistent" means degrading relatively quickly, generally having a half-life of less than 96 hours.

"Nontrout waters" means fresh waters that have not been designated in this subchapter as trout production or trout maintenance. These waters are generally not suitable for trout because of their physical, chemical, or biological characteristics, but are suitable for a wide variety of other fish species.

"NPDES" means National Pollutant Discharge Elimination System.

"NT" means nontrout waters.

"Nutrient" means a chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the growth and development of organisms.

"Outstanding National Resource Waters" means high quality waters that constitute an outstanding national resource (for example, waters of National/State Parks and Wildlife

Refuges and waters of exceptional recreational or ecological significance) as designated in N.J.A.C. 7:98-1.15(i).

"Persistent" means relatively resistant to degradation, generally having a half life of over 96 hours.

"Pinelands waters" means all waters within the boundaries of the Pinelands Area, except those waters designated as FW1 in this subchapter, as established in the Pinelands Protection Act (N.J.S.A. 13:18A-1 et seq.) and shown on Plate 1 of the "Comprehensive Management Plan" adopted by the New Jersey Pinelands Commission in November 1980.

"PL" means the general surface water classification applied to Pinelands Waters.

"Primary contact recreation" means recreational activities that involve significant ingestion risks and includes, but is not limited to, wading, swimming, diving, surfing, and water skiing.

"Public hearing" means a legislative type hearing before a representative or representatives of the Department providing the opportunity for public comment, but does not include cross-examination.

"River mile" or "R.M." means the distance, measured in statute miles, between two locations on a stream, with the first location designated as mile zero. Mile zero for the Delaware River is located at the intersection of the center line of the navigation channel and a line between the Cape May Light, New Jersey, and the tip of Cape Henlopen, Delaware.

"Saline waters" means waters having salinities generally greater than 3.5 parts per thousand at mean high tide.

"SC" means the general surfape water classification applied to coastal saline waters.

"SE" means the general surface water classification applied to saline waters of estuaries.

"Secondary contact recreation" means recreational activities where the probability of water ingestion is minimal and includes, but is not limited to, boating and fishing.

"Shellfish" means those mollusks commonly known as clams, oysters, or mussels.

"Shellfish waters" means waters classified as Approved, Seasonally Approved, Special Restricted, Seasonally Special Restricted or Condemned that support or possess the potential to support shellfish which are within the Coastal Area Facility Review Act (C.A.F.R.A.) zone as delineated in 1973, (excluding: 1 - The Cohansey River upstream

1. Maintenance, migration and propagation of the natural and established biota;

2. Primary and secondary contact recreation;

3. Industrial and agricultural water supply;

4. Public potable water supply after such treatment as required by law or regulation; and

5. Any other reasonable uses.

(d) In all SE1 waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

2. Maintenance, migration and propagation of the natural and established biota;

3. Primary and secondary contact recreation; and

4. Any other reasonable uses.

(e) In all SE2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;

2. Migration of diadromous fish;

3. Maintenance of wildlife;

4. Secondary contact recreation; and

5. Any other reasonable uses.

(f) In all SE3 waters the designated uses are:

1. Secondary contact recreation;

2. Maintenance and migration of fish populations;

3. Migration of diadromous fish;

4. Maintenance of wildlife; and

5. Any other reasonable uses.

(g) In all SC waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

2. Primary and secondary contact recreation;

3. Maintenance, migration and propagation of the natural and established biota; and

4. Any other reasonable uses.

7:9B-1.13 Designated uses of mainstem Delaware River and Delaware Bay as set forth in the "Delaware River Basin Commission, dministrative Manual - Part iil Water Quality Regulations," rticle 3, dated May 22, 1991 including all amendments and future supplements thereto.

(a) The designated uses for the mainstem Delaware River and Delaware Bay are those contained in "Delaware River Basin Commission, Water Quality Regulations, Administrative Manual - Part III," Article 3, dated May 22, 1991, including all amendments and future supplements thereto.

(b) The designated uses for other waters under the jurisdiction of the DRBC are as set forth at N.J.A.C. 7:9B-1.15(d).

7:9B-1.14 Surface water quality criteria

(a) Surface water quality criteria for FW1 waters shall be maintained as to quality in their natural state.

(b) Surface water quality criteria for PL waters are as follows:

1. These waters shall be maintained as to quality in their existing state or that quality necessary to attain or protect the designated uses, whichever is more stringent.

   i. For Nitrate-Nitrogen a level of 2 mg/l shall be maintained in the surface waters unless it is shown that a lower level must be maintained to protect the existing surface water quality.

   ii. A pH level between 3.5 and 5.5 shall be maintained unless it is demonstrated that a pH level outside of that range is necessary to protect the existing/ designated uses.

5. To find unnamed waterways or waterbodies or named waterways or waterbodies which do not appear in the listing, use the following instructions:
   i. Unnamed or unlisted freshwater streams that flow into streams classified as FW2-TP, FW2-TM, or FW2-NT take the classification of the classified stream they enter, unless the unlisted stream is a PL water which is covered in (b)5vil below. if the stream could be a C1 water, see (b)5vi below.
   ii. All freshwater lakes, ponds and reservoirs that are five or more acres in surface area, that are not located entirely within the Pinelands Area boundaries (see (b)5vli below) and that are not specifically listed as FW2-TP or FW2-TM are classified as FW2-NT, This includes lakes, ponds and reservoirs on segments of streams which are classified as FW2-TM or FW2-TP such as Saxton Lake on the Musconetcong River. if the waterbody could be a C1 water, also check (b)5vi below.
   iii. All freshwater lakes, ponds and reservoirs, that are less than five acres in surface area, upstream of and contiguous with FW2-TP or FW2-TM streams, and which are not located entirely within the Pinelands Area boundaries (see(b)5vii below) are classified as FW2-TM. All other freshwater lakes, ponds and reservoirs that are not otherwise classified in this subsection or the following Tables are classified as FW2-NT. if the waterbody could be a C1 water, also check (b)5vl below.
   iv. Unnamed or unlisted streams that enter FW2 lakes, ponds and reservoirs take the classification of either the listed tributary stream flowing into the lake with the highest classification or the listed tributary stream leaving the lake with the highest classification, whichever has the highest classification, or, if there are no listed tributary or outlet streams to the lake, the first listed stream downstream of the lake. if the stream is located within the boundaries of the Pinelands Area, see (b)5.vii. below; if it could be a C1 water, also see (b)5vi below.
   v. Unnamed or unlisted saline waterways and watertxodies are classified as SE1 in the Atlantic Coastal Basin. Unnamed or unlisted saline watenvays which enter SE2 or SE3 waters in the Passaic, Hackensack and New York Harbor Complex basin are classified as SE2 unless otherwise classified within Table 3 in (e) below. Freshwater portions of unnamed or unlisted streams entering SE1, SE2, or SE3 waters are classified as FW2-NT, This only applies to waters that are not PL waters (see (b)5vli below). if the waterbody or waterway could be a C1 water, also see (b)5vi below.
   vi. if the waterway or waterbody of interest flows through or is entirely located within State parks, forests or fish and game lands, Federal wildlife refuges, other special holdings, or is a State shellfish water as defined in this subchapter, the Department's maps should be checked to determine if the waterbody of interest is mapped as a C1 water. if the waterway or waterbody does not appear on the United States Geological Survey quadrangle that the Department used as a base map in its designation of the

C1 waters, the Department will determine on a case-by-case basis whether the waterway or waterbody should be designated as C1.

vii. All waterways or waterbodies, or portions of waterways or waterbodies, that are located within the boundaries of the Pinelands Area established at N.J.S.A. 13:18A-11a are classified as PL unless they are listed as FW1 waters in Table 6 in (h) below. A tributary entering a PL stream is classified as PL only for those portions of the tributary that are within the Pinelands Area. Lakes are classified as PL only if they are located entirely within the Pinelands Area.

6. The following 10 classifications are used for the sole purpose of identifying the water quality classification of the waters listed in the Tables in (c) through (h) below:
   i. "PW1" means freshwaters wholly within Federal or State lands or special holdings that are preserved for posterity and are not subject to manmade wastewater discharges.
   ii. "FW2-TP" means FW2 Trout Production.
   iii. "FW2-TM" means FW2 Trout Maintenance.
   iv. "FW2-NT" means FW2 Non Trout.
   v. "PL" means Pinelands Waters.
   vi. "SE1" means saline estuarine waters whose designated uses are listed in N.J.A.C. 7:9B-1.12(d).
   vii. "SE2" means saline estuarine waters whose designated uses are listed in N.J.A.C. 7:9B-1.12(e).
   viii. "SE3" means saline estuarine waters whose designated uses are listed in N.J.A.C. 7:9B-1.12(f).
   ix. "SC" means the general surface water classification applied to saline coastal waters.
   x. FW2-NT/SE1 (or a similar designation that combines two classifications) means a waterway in which there may be a salt water/fresh water interface. The exact point of demarcation between the fresh and saline waters must be determined by salinity measurements and is that point where the salinity reaches 3.5 parts per thousand at mean high tide. The stream is classified as FW2-NT in the fresh portions (salinity less than or equai to 3.5 parts per thousarxl at mean high tide) and SE1 in the saline portions.

7. The following water quality designations are used in Tables 1 through 5 in (c) through (g), respectively, below:
   i. "(C1)" means Category 1 waters;
   li. "(tp)" indicates trout production in waters which are classified as FW1. This is for information only and does not affect the water quality criteria for those waters;
   iii. "(tm)" indicates trout maintenance in waters which are classified as PL or FW1. For FW1 waters this is for infonnation only and does not affect the water quality criteria for those waters.

(e) The surface water classifications in Table 3 are for waters of the Passaic, Hackensack and New York Harbor Complex Basin:

TABLE 3

Waterbody	Classification
APSHAWA BROOK (Macopin) - Entire length	FW2-TP(C1)
ARTHUR KILL	
(Perth Amboy) - The Kill and its saline New Jersey tributaries between the Outerbridge Crossing and a line connecting Feny PL, Perth Amboy to Wards Pt., Staten Island, New York	SE2
(Elizabeth) - From an east-west line connecting Elizabethport with Bergen Pt., Bayonne to the Outerbridge Crossing	SE3
(Woodbridge) - All freshwater tributaries	FW2-NT
BEAR SWAMP BROOK (Mahwah) - Entire length	FW2-TP(C1)
BEAR SWAMP LAKE (Ringwood State Park)	FW2-NT(C1)
BEAVER BROOK	
(Meriden) - From Splitrock Reservoir Dam downstream to Meriden Road Bridge	FW2-TP(C1)
(Denville) - Meriden Road Bridge to Rockaway River	FW2-NT
TRIBUTARIES	
(Meriden) - Two tributaries located approximately three quarters of a mile southwest of Meriden	FW2-TP(C1)
BEECH BROOK	
(West Milford) - From State line downstream to Monksville Reservoir	FW2-TM
BELCHER CREEK (W. Milford) - Entire length	FW2-NT
BERRYS CREEK (Secaucus) - Entire length	FW2-NT/SE2
BLACK BROOK	
(Meyersville) - Entire length, except segment described below	FW2-NT
(Great Swamp) - Segment and tributaries within the Great Swamp National Wildlife Refuge	FW2-NT(C1)
BLUE MINE BROOK	
(Wanaque) - Entire length, except segment described below	FW2-TM
(Norvin Green State Forest) - That portion of the stream and any tributaries within the Norvin Green State Forest	FW2-TM(C1)
BRUSHWOOD POND (Ringwood State Park)	FW2-TM(C1)

ELIZABETH RIVER	
(Elizabeth) - Source to Broad St. bridge, Elizabeth and all freshwater tributaries	FW2-NT
(Elizabeth) - Broad St. bridge to mouth	SE3
FOX BROOK (Mahwah) - Entire length	FW2-NT
GLASMERE POND (Ringwood)	FW2-NT(C1)
GOFFLE BROOK (Hawthorne) - Entire length	FW2-NT
GRANNEY BROOK - See SPRING BROOK	
GRANNIS BROOK (Morris Plains) - Entire length	FW2-NT
GREAT BROOK	
(Chatham) - Entire length, except segment described below	FW2-NT
(Great Swamp) - Segment within the boundaries of the Great Swamp National Wildlife Refuge	FW2-NT(C1)
GREEN BROOK	
(W. Milford) - Entire length, except those segments described below	FW2-TP(C1)
(Hewitt State Forest) - Those segments and tributaries which originate and are located entirely within the Hewitt State Forest boundaries	FW1(tp)
GREEN POND (Rockaway)	FW2-TM
GREEN POND BROOK	
(Picatinny Arsenal) - Green Pond outlet to, but not including, Picatinny Lake	FW2-TP(C1)
(Wharton) - Outlet of Picatinny Lake to the confluence with the Rockaway River	FW2-NT
GREENWOOD LAKE (W. Milford)	FW2-TM
HACKENSACK RIVER	
(Oradell) - Source to Oradell dam	FW2-NT
(Oradell) - Main stem and saline tributaries from Oradell dam to the confluence with Overpeck Creek	SE1
(Little Ferry) - Main stem and saline tributaries from Overpeck Creek to Route 1 and 9 crossing	SE2
→ (Kearny Point) - Main stem downstream from Route 1 and 9 crossing	SE3
TRIBUTARIES	
(Oradell) - Tributaries joining the main stem between Oradell dam and the confluence with Overpeck Creek	FW2-NT/SE1
(Little Feny) - Tributaries joining the main stem downstream of Overpeck Creek	FW2-NT/SE2
HANKS POND (Clinton) - Pond and all tributaries	FW1
HARMONY BROOK (Brookside) - Entire length	FW2-TP(C1)
HARRISONS BROOK (Bernards) - Entire length	FW2-NT

HAVEMEYER BROOK (Mahwah) - Entire length	FW2-TP(C1)
HEWITT BROOK (W. Milford) - Entire length	FW2-TP(C1)
HIBERNIA BROOK	
(Marcella) - Source to first Green Pond Road bridge downstream of Lake Emma	FW2-TP(C1)
(Hibernia) - First Green Pond Road bridge to confluence with Beaver Brook	FW2-TM
TRIBUTARY	
(Lake Ames) - Source to, but not Including, Lake Ames	FW2-TP(C1)
HIGH MOUNTAIN BROOK (Ringwood) - Source to, but not Including, Skyline Lake	FW2-TP(C1)
HOHOKUS BROOK (Hohokus) - Entire length	FW2-NT/SE2
HUDSON RIVER	
(Rockleigh) - River and saline portions of New Jersey tributaries from the New Jersey-New York boundary line In the north to its confluence with the Harlem River, New York	SE1
(Englewood Cliffs) - River and saline portions of New Jersey tributaries from the confluence with the Harlem River, New York to a north-south line connecting Constable Hook (Bayonne) to St. George (Staten Island, New York)	SE2
TRIBUTARIES	
(Rockleigh) - Freshwater portions of tributaries to the Hudson River in New Jersey	FW2-NT
INDIAN GROVE BROOK (Bernardsville) - Entire length	FW2-TP(C1)
JACKSON BROOK	
(Mine Hill) - Source to the boundary of Hurd Park, Dover	FW2-TP(C1)
(Dover) - Hurd Park to Rockaway River	FW2-NT
JENNINGS CREEK (W. Milford) - State line to Wanaque River	FW2-TP(C1)
JERSEY CITY RESERVOIR (Boonton)	FW2-TM
KANOUSE BROOK (Newfoundland) - Entire length	FW2-TP(C1)
KIKEOUT BROOK (Butler) - Entire length	FW2-NT
KILL VAN KULL (Bayonne) - Westerly from a north-south line connecting Constable Hook (Bayonne) to St. George (Staten Island, New York)	SE3
LAKE RICKONDA OUTLET STREAM (Monks) - That segment of the outlet stream from Lake Rickonda within Ringwood State Park	FW2-TM(C1)
LAKE STOCKHOLM BROOK	
(Stockholm) - Entire length, except tributaries described separately below	FW2-TP(C1)
(Stockholm) - Portion of westerly tributary, from its	FW1(tp)

origins to about 1000 feet south of the Route 23 bridge, located entirely within the boundaries of the Newark watershed	
(Stockholm) - Brook between Hamburg Turnpike and Vernon-Stockholm Rd. to its confluence with Lake Stockholm Brook, north of Rt. 23	FW1(tp)
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 downstream to its confluence with the southwestern outlet stream from Clinton Resevoir just upstream of the confluence of the outlet stream and 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
MONKSVILLE RESERVOIR (Long Pond Iron Works State Park)	FW2-TM(C1)
MORSES CREEK (Linden) - Entire length	FW2-NT/SE3
MOSSMANS BROOK (West Milford) - Source to confluence with Clinton Reservoir	FW2-TP(C1)
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)
OHIO BROOK (Morris Township) - Source downstream to Morristown town line	FW2-TM
OVERPECK CREEK (Palisades Park) - Entire length	FW2-NT/SE2
PACACK BROOK	
(Canistear) - Brook and tributaries upstream of	FW1

Canistear Reservoir located entirely within the boundaries of the Newark Watershed	
(Stockholm) - Outlet of Canistear Reservoir to Pequannock River	FW2-NT
PASSAIC RIVER	
(Mendham) - Source to Interstate 287 bridge, except tributaries described separately below	FW2-TP(C1)
(Paterson) - Interstate 287 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
TRIBUTARIES	
(Great Piece Meadows State Park) - Tributaries within Great Piece Meadows State Park	FW2-NT(C1)
PECKMAN RIVER (Verona) - Entire length	FW2-NT
PEQUANNOCK RIVER	
MAIN STEM	
(Vernon) - Source to confluence with Pacack Brook	FW1(tp)
(Hardyston) - Pacack Brook to, but not including, Macopin Reservoir or the tributaries described separately below	FW2-TM
(Kinnelon) - Macopin Reservoir outlet to Hamburg Turnpike bridge in Pompton Lakes Borough	FW2-TP(C1)
(Riverdale) - Hamburg Turnpike bridge in Pompton Lakes Borough to confluence with Wanaque River	FW2-TM
(Pompton Plains) - Confluence with Wanaque River downstream to confluence with Pompton River	FW2-NT
TRIBUTARIES	
(Copperas Mtn.) - Entire length	FW2-TP(C1)
(Smoke Rise) - Entire length	FW2-TP(C1)
(Green Pond Junction) - Tributary at Green Pond Junction from its origin downstream to Route 23	FW1(tm)
(Jefferson) - Tributary joining the main stem about 3500± feet southeast of the Sussex-Passaic County line, near Jefferson from its origin to about 2000 feet upstream of the pond	FW1(tm)
(Lake Kampfe) - Source to, but not including, Lake Kampfe	FW2-TM
(Lake Kampfe) - Lake Kampfe to Pequannock River, except tributary described separately below	FW2-NT
(Lake Kampfe) - Tributary within the boundaries of Norvin Green State Forest, originating west of Tome Mtn.	FW2-NT(C1)
PILES CREEK (Grasselli) - Entire length	SE3

Channel Marker Flashing Red 2 and terminating on the eastern shoreline of the Galilee section of Monmouth Beach.	
NESHANIC RIVER (Reaville) - Entire length	FW2-NT
NORTON BROOK (Norton) - Entire length	FW2-TP(C1)
OAKDALE CREEK (Chester) - Entire length	FW2-TP(C1)
OAKEYS BROOK (Deans) - Entire length	FW2-NT
OCEANPORT CREEK	
(Fort Monmouth) - Source to a line beginning on the easternmost extent of Horseneck Point and bearing approximately 140 degrees T (True North) to its terminus on the westernmost extent of an unnamed extent of Monmouth Boulevard In Oceanport	FW2-NT/SE1
(Oceanport) - Creek downstream of line described above	SE1(C1)
PARKERS CREEK	
(Fort Monmouth) - Source to a line beginning on the easternmost extent of Horseneck Point and bearing approximately 000 degrees T (True North) to its terminus on Breezy Point on the Little Silver side (north) side of the creek	FW2-NT/SE1
(Fort Monmouth) - Creek downstream of line described above	SE1(C1)
PEAPACK BROOK (Gladstone) - Entire length	FW2-TP(C1)
PETERS BROOK (Somerville) - Entire length	FW2-NT
PIGEON SWAMP (Pigeon Swamp Slate Park) - All waters within the boundaries of Pigeon Swamp State Park	FW2-NT(C1)
PIKE RUN (Belle Meade) - Entire length	FW2-NT
PINE BROOK (Clarks Mills) - Entire length	FW2-NT
PINE BROOK (Cooks Mill) - Entire length	FW2-TM
PLEASANT RUN (Readington) - Entire length	FW2-NT
PRESCOTT BROOK (Stanton Station) - Entire length	FW2-TM
RAMANESSIN (HOP) BROOK (Holmdel) - Entire length	FW2-TM
RARITAN BAY - Entire drainage	FW2-NT/SE1
RARITAN RIVER	
NORTH BRANCH (Also see INDIA BROOK)	
(Pleasant Valley) - Source to, but not including, Ravine Lake	FW2-TP(C1)
(Far Hills) - Ravine Lake dam to Rt. 512 bridge	FW2-TM
(Bedminister) - Rt. 512 bridge to confluence with South Branch, Raritan River	FW2-NT
SOUTH BRANCH RARITAN RIVER	
(Mt. Olive) - Source to the dam that is 390 feet	FW2-NT(C1)

REFERENCE NO. 40

WATER QUALITY REGULATIONS

SURFACE WATER AND GROUNDWATER CLASSIFICATIONS AND STANDARDS

New York State
Codes, Rules and Regulations
Title 6, Chapter X
Parts 700-705

New York State Department of Environmental Conservation

PART 700

DEFINITIONS, SAMPLES AND TESTS

(Statutory authority: Environmental Conservation Law, §§ 3-0301[2][m], 15-0313, 17-0301, 17-0303, 17-0809)

Sec.		Sec.	
700.1	Definitions	700.3	Tests or analytical methods
700.2	Collection of samples	700.4	Severability

Historical Note

Part repealed, new (§§ 700.1-700.2) filed: April 28, 1972; Feb. 25, 1974; repealed, new (§§ 700.1-700.4) filed Aug. 2, 1991 eff. 30 days after filing.

Section 700.1 Definitions. (a) The terms, words, or phrases used in Parts 700-705 of this Title shall have the meanings described below.

(1) *Acute toxic effect* means an effect that usually occurs shortly after the administration of either a single dose or multiple doses of a chemical.

(2) *Administrator* means the Administrator of the United States Environmental Protection Agency.

(3) *Approved treatment* as applied to water supplies means treatment accepted as satisfactory by the authorities responsible for exercising supervision over the quality of water supplies.

(4) *Best usages* as specified for each class of water means those uses as determined by the commissioner in accordance with the considerations prescribed by the Environmental Conservation Law.

(5) *Chronic toxic effect* means an effect that is irreversible or progressive or occurs because the rate of injury is greater than the rate of repair during prolonged exposure to a chemical.

(6) *Coastal waters* mean those marine waters within the territorial limits of the State other than estuaries and enclosed bays. Long Island Sound is designated as coastal waters for the purposes of thermal discharges.

(7) *Commissioner* means the Commissioner of the Department of Environmental Conservation.

(8) *Consolidated rock* or *bedrock* means the compact or solid hard rock beneath or exposed at the surface of the earth or overlain by surface waters.

(9) *Department* means the New York State Department of Environmental Conservation.

(10) *Disposal system* means a system for disposing of sewage, industrial waste or other wastes, including sewer systems and treatment works.

(11) *Effluent limitations* mean any restriction on quantities, qualities, rates and concentrations of chemical, physical, biological, and other constituents of effluents that are discharged into or allowed to run from an outlet or point source or any other discharge within the meaning of section 17-0501 of the Environmental Conservation Law into surface waters, groundwater or unsaturated zones.

(12) *Enclosed bays* mean those marine waters within the territorial limits of New York State, other than coastal waters or estuaries, in which exchange of sea water is severely limited by barrier beaches. For the purpose of thermal discharges, the following are designated as enclosed bays: Jamaica Bay, Hempstead Bay, Great South Bay, Moriches Bay, Shinnecock Bay and Mecox Bay.

(b) These waters shall contain no floating solids, settleable solids, oil, sludge deposits, toxic wastes, deleterious substances, colored or other wastes or heated liquids attributable to sewage, industrial wastes or other wastes.

(c) There shall be no discharge or disposal of sewage, industrial wastes or other wastes into these waters.

(d) These waters shall remain no phosphorus and nitrogen in amounts that will result in growths of algae weeds and slimes that will impair the waters for their best usages.

Historical Note

Sec. amd. filed May 26, 1967; repealed, new filed: April 28, 1972; Feb. 25, 1974; renum. 701.18, new filed July 3 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.4 Class A-Special (A-S) fresh surface waters. (a) The best usages of Class A-S waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival.

(b) This classification may be given to those international boundary waters that, if subjected to approved treatment, equal to coagulation, sedimentation, filtration and disinfection with additional treatment, if necessary, to reduce naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.

Historical Note

Sec. repealed, new filed: April 28, 1972; Feb. 25, 1974; amd. filed Sept. 20, 1974; renum. 701.10, new filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

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701.5 Class AA fresh surface waters. (a) The best usages of Class AA waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival.

(b) This classification may be given to those waters that, if subjected to approved disinfection treatment, with additional treatment if necessary to remove naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.

Historical Note

Sec. repealed, filed March 20, 1087; new filed Feb. 25, 1974; amd. filed Sept. 20, 1974; renum. 701.20, new filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.6 Class A fresh surface waters. (a) The best usages of Class A waters are: a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival.

(b) This classification may be given to those waters that, if subjected to approved treatment equal to coagulation, sedimentation, filtration and disinfection, with additional treatment if necessary to reduce naturally present impurities, meet or will meet New York State Department of Health drinking water standards and are or will be considered safe and satisfactory for drinking water purposes.

Historical Note

Sec. filed July 3, 1085; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.7 Class B fresh surface waters. The best usages of Class B waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.8 Class C fresh surface waters. The best usage of Class C waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.9 Class D fresh surface waters. The best usage of Class D waters is fishing. Due to such natural conditions as intermittency of flow, water conditions not conducive to propagation of game fishery, or stream bed conditions, the waters will not support fish propagation. These waters shall be suitable for fish survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

SALINE SURFACE WATERS

701.10 Class SA saline surface waters. The best usages of Class SA waters are shellfishing for market purposes, primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.11 Class SB saline surface waters. The best usages of Class SB waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.12 Class SC saline surface waters. The best usage of Class SC waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.13 Class I saline surface waters. The best usages of Class I waters are secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.14 Class SD saline surface waters. The best usage of Class SD waters is fishing. These waters shall be suitable for fish survival. This classification may be given to those waters that, because of natural or man-made conditions, cannot meet the requirements for primary and secondary contact recreation and fish propagation.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days ntler filing.

GROUNDWATERS

701.15 Class OA frosh groundwaters. The best usage of Class GA waters is as a source of potable water supply. Class GA waters are fresh groundwaters.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 duya utter filing.

701.16 Class GSA saline groundwaters. The best usages of Class GSA waters are as a source of potable mineral waters, for conversion to fresh potable waters, or as raw material for the mimiifacturu of sodiim ciilorido or its derivatives or similar products. Class GSA waters are saline groundwaters.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1901 eff. 30 days after filing.

701.17 Class GSII saline groundwaters. The best usage of Class GSB waters is as a receiving water for disposal of wastes. Class GSB waters aro saline groundwaters lhal have a chloride concentration in excess of 1,000 milligrams per liter or a total dissolved solids concentration in excess of 2,000 milligrams per liter.

Historical Note

Sec. filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.18 Assignment of groundwater classifications. (a) The groundwater classifications defined In sections 701.15 through 701.16 of this Part are assigned to all the groundwaters of New York State.

(b) The Class GSB shall not be assigned to any groundwaters of the State, unless the commissioner finds that adjacent and tributary groundwaters and the best usages thereof will not be Impaired by such classificntion.

Historical Note

Sec. added by renum. 701.3, filed July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.19 Severability. If any provision of this Part or its application to any person or circumstance is held to be invalid, the remainder of this Part and the application of that provision to other persons or circumstances will not be affected.

Historical Note

Sec. added by renum. and amd. 701.4, filed July 3, 1985; amd. filed Sept. 20, 1985; repealed, new filed Aug. 2, 1991 eff. 30 days after filing.

701.20

Historical Note

Sec. added by renum. 701.5, filed July 3, 1085; amd. filed Sept. 20, 1985; repealed, filed Aug. 2, 1991 eff. 30 days after filing.

PART 702

DERIVATION AND USE OF STANDARDS AND GUIDANCE VALUES

(Statutory authority: Environmental Conservation Law, §§ 3-0301[2][m], 15-0313, 17-0301, 17-0303, 17-0809)

Sec.
702.1 Baals for derivation of water quality standards and guidance values
702.2 Standards and guidance values for protection of human health and sources of potable water supplies
702.3 Procedures for deriving standards and guidance values based on Specific MCLs and principal organic contaminant classes
702.4 Procedures for deriving standards and guidance values based on oncogenic effects
702.5 Procedures lor deriving etundarda and guidance values based on nononcogenic effects
702.6 Procedure for deriving standards and guidance values based on aesthetic considerations
702.7 Procedure for deriving standards and guidance values bused on chemicul correlation
702.8 Procedures for deriving standards and guidance values for protection of human health from consumption of fish
702.9 Standards and guidance values for protection of aquatic life
702.10 Procedures for deriving standards and guidance values for fish propagation and survival
702.11 Procedures for deriving standards and guidance values lor fish survival
702.12 Procedures for deriving standards and guidance values based on tainting of aquatic food
702.13 Procedures for deriving standards and guidance values to protect wildlife consumers of fish
702.14 Procedure for deriving standards and guidance values based on chemical correlations
702.15 Derivation of guidance values
702.18 Derivation and implementation of effluent limitations
702.17 Variances for effluent limitations based on aquatic standards or guidance valuea
702.18 More stringent groundwater effluent standards or limitations
702.19 Modifications of groundwater effluent standards or limitations
702.20 Studies and monitoring for discharges to groundwater
702.21 Exceptions to groundwater effluent limitations
702.22 Severability

Historical Note

Part repealed, new filed: April 28, 1972; Feb. 25, 1974; repealed, new (§§ 702.1-702.22) filed Aug. 2, 1991 eff. 30 days after filing.

Section 702.1 Basis for derivation of water quality standards and guidance values. (a) The control of taste-, color- and odor-producing, toxic and other deleterious substances is implemented through the use of standards and guidance values. Standards and guidance values for such substances shall be derived according to the procedures set forth in thia Part.

(b) The derivation of standards and guidance values will consider, to the extent possible, variations in natural or background conditions of waters, including but not limited to alkalinity, temperature, hardness and pH.

Historical Note

Sec. repealed, new filed: April 28, 1972; Feb. 25, 1974; amds. filed: Sept. 20, 1974; July 3, 1985; repealed, new filed Aug. 2, 1991 eff. 80 days after filing.

702.2 Standards and guidance values for protection of human health and sources of potable water supplies. (a) Standards and guidance values for protection of the best usage as a source of potable water supply shall protect human health and drinking water sources and are referred to as health (water source) values.

REFERENCE NO. 41

TABLE I (cont'd)

Item No.	Waters Index Number	Name	Description	Map Ref. No.	Class	Standards
→ 15	SI (14.6 -18.0) portion	Kill Van Kull	That portion within New York State from outlet of Newark Bay to mouth of Kill Van Kull (at north-south line drawn from northernmost point of Staten Island to easternmost point at Constable Point, Bayonne, New Jersey).	S-23nw S-23ne	SD	SD
			STATEN ISLAND TRIBUTARIES			
16	SI P 1039 SI P 1030a SI P 1039b SI P 1040	Grasmere Lake Ipes Pond Shore Acres Pond Cameron Lake	Isolated bodies of water.	3-23se	B	B
17	SI P 1040a, P 1040b, P 1040c, P 1040d	Tribs. of New Creek	Isolated ponds with New Creek watershed.	S-23se	B	B
18	SI 1 and tribs.	New Creek	Tidal estuary and fresh water tribs.	S-23se		
			Tidal portion.		I	I
			Fresh waters portion.		C	C
19	SI 2	Ureal Kills Creek	Enters Great Kills Harbor at Great Kills Park.	S-23sw S-23se	1	1

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STATE OF NEW YORK

OFFICIAL COMPILATION

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SUBCHAPTER B

Classes and Standards of Quality and Purity Assigned to Fresh Surface and Tidal Salt Waters (continued)

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Article 13 New York City Waters Series 890

ARTICLE 13

New York City Waters Series

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PART 890

NEW YORK CITY WATERS

(Statutory authority: Environmental Conservation Law, § 17-0301)

Sec.
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890.3 Definitions
890.4 Special conditions
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890.9 Map 3
890.10 Map 4
890.11 Quadrangle maps

Historical Note

Part amd. filed June 20, 1988 eff. 30 days after filing. Amended statutory authority.

§ 890.1 Adopting order.

(a) Pursuant to article 12 of the Public Health Law, the Water Resources Commission, after proper study and following public hearings held on due notice, hereby adopts and assigns the following classifications and standards of quality and purity to all surface waters within the designated drainage basins of New York Bay, Raritan Bay and a portion of the Atlantic Ocean, including the subbasins of Arthur Kill, Kill Van Kull, the Harlem River and the Lower East River as hereinafter described.

(b) This adoption and assignment of standards of quality and purity to the above designated waters shall be effective December 22, 1964.

§ 890.2 Designated waters.

(a) The designated waters are within the following areas:

(1) the drainage basin of New York Bay below the mouth of the Hudson River at the south tip of Manhattan Island, including Gravesend Bay, Coney Island Creek, Atlantic Basin, Erie Basin, Gowanus Bay, Gowanus Canal, Upper New York Bay, Lower New York Bay, The Narrows and the Atlantic Ocean waters, including the drainage area off Coney Island and lying westerly of a north-south line from Light Inlet at the southeasteriy tip of Coney Island peninsula to the southwesteriy tip of Rockaway Point; thence along the jetty to Rockaway jetty light; thence due south to the New York - New Jersey boundary line;

(2) the lower East River drainage basin from the mouth to a line across the East River north of Wards Island between Stony Point in Bronx County and Lawrence Point in Queens County; and

(3) the drainage basins of Arthur Kill, Kill Van Kull, the Harlem River and Raritan Bay.

(b) The above designated waters are located as shown on Map 1, section 890.7 *infra*, and as contained within the topographical or basin limit line on the reproduced topographical reference maps set forth in section 890.11, *infra*. Classifications of primary waters are outlined on Map 3, section 890.9, *infra*.

890.6 Table I.

TABLE I

CLASSIFICATIONS AND STANDARDS OF QUALITY AND PURITY ASSIGNED TO FRESH SURFACE WATERS AND TIDAL SALT WATERS, INCLUDING CEHTAIN TIDAL WATERS OF THE INTERSTATE SANITATION DISTRICT WITHIN DESIGNATED DRAINAGE BASINS OF NEW YORK BAY, RARITAN BAY AND A PORTION OF THE ATLANTIC OCEAN, INCLUDING THE SUBBASINS OF ARTHUR KILL, KILL VAN KULL, THE HARLEM RIVER AND THE LOWER EAST RIVER, BRONX, KINGS, NEW YORK, QUEENS, RICHMOND AND WESTCHESTER COUNTIES, NEW YORK

Item No.	*Waters Index Number*	*Name*	*Description*	*Map Ref. No.*	*Class*	*Standards*
			ATLANTIC OCEAN AND NEW YORK BAY			
1		Atlantic Ocean portion	That portion of the ocean within New York State opposite Rockaway peninsula bounded on the west by a line from the tip of Rockaway Point, thence south along the jetty to Rockaway jetty light, thence due south to the state boundary line; and bounded on the north by the shore of Rockaway peninsula from the western tip to the Nassau-Queens county line at East Rockaway Inlet; and bounded on the east by the Nassau-Queens county line along East Rockaway Inlet, thence south to the state boundary line.	S-24sw S-24se	SA	SA
2		Atlantic Ocean and Lower New York Bay east portions	Ocean and bay waters within New York State opposite Coney Island peninsula and Staten Island bounded on the west by a north-south line drawn from the south limits of Fort Wadsworth Military Reservation and passing through West Bank light to New York-New Jersey boundary line; and bounded on the north by a line drawn from the south limits of	S-23se S-24sw	SB	SB

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TABLE I (cont'd)

Item No.	Waters Index Number	Name	Description	Map Ref. No.	Class	Standards
2 (cont'd)			Fort Wadsworth Military Reservation and extending southeasterly to Norton Point at the western tip of Coney Island peninsula near Sea Gate, thence extending the line along south shore of Coney Island to Light Inlet at southeasterly tip of Coney Island peninsula near Manhattan Beach; and bounded on east by north-south line beginning at described Light Inlet and extending southward to south tip of Rockaway jetty light, thence due south to New York-New Jersey boundary line.			
3		Lower New York Bay west portion	That portion of Bay within New York State bounded on east by north-south line drawn from south limits of Fort Wadsworth Military Reservation and passing through West Bank light to New York-New Jersey boundary line; and bounded on west by north-south line drawn from south tip of Crookes Point to Point Comfort at Keansburg, New Jersey.	S-2Sse S-23sw T-23nw T-23ne	SB	SB

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